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Foreword

The Junior College was set up in 1995 as part of the University of Malta. Since the very beginning, members of staff have felt the need, and sought the possibility to publish their research in an academic journal.

Following the setting up of an Editorial Board, work started on the publication of the first edition of Symposia Melitensia in 2004. Although this journal was published by the University of Malta Junior College, it has always been open to all researchers and academics. The journal has had a multi-disciplinary nature since its inception, and has been successfully published annually since its first edition 15 years ago.

Today is an opportunity to express our thanks and appreciation to previous editors for their invaluable work, all the members of the Editorial Board who peer-reviewed the papers, as well as to all contributors.

Symposia Melitensia has undergone a number of changes over these years including the cover, the format, the editors and editorial team, as well as the shift from paper to online format.

This will be the last edition in its current layout. The next edition, which will be published in 2021, will be revamped in line with current needs. Symposia Melitensia will still be open to all, not least to the participants of the Annual International Multi-Disciplinary Conference organised by the Junior College. The journal will offer different publication typologies to cater for the different genres of research styles. More information about the new format of the journal can be found in this publication.

I would like to take this opportunity to thank everyone involved in the publication of this prestigious journal and look forward to its future editions.

A handwritten signature in black ink, appearing to read 'Paul Xuereb', written in a cursive style.

Paul Xuereb

Symposia Melitensia – an academic multi-disciplinary journal

Guidelines for Manuscript Submission (2020)

Symposia Melitensia is a journal published by the University of Malta Junior College. The Scientific Committee of the College is responsible for the editing and publishing of this journal. The journal is open to participants of the Annual International Multi-Disciplinary Conference organised by the University of Malta Junior College as well as researchers and academics. Authors have the possibility of publishing their work in different types of submissions. These submissions will all undergo double blind review and be published on open access. The printing of hard copies may be available upon request.

Consideration of manuscripts for publication

Authors may submit their research for publication in the journal *Symposia Melitensia* under the following publication typologies:

- **Commentary:** This position paper of between **1,000** and **1,500 words** (up to 3 pages) typically presents an argument or an academic opinion about an issue. The commentary needs to convince the audience that the opinion presented is valid and warrants attention.
- **Peer Reviewed Short Report:** This short communication paper of between **2,500** and **4,000 words** (up to 7 pages) enables authors to communicate a brief report of data from their original research. Through this paper the author/s will emphasise the importance of the issues discussed which may stimulate further research in the field. Usually it has the format of a long paper, however the results and discussion are merged.
- **Peer Reviewed Original Research Article:** This paper of **5,000** to **6,000** words (up to 12 pages) should include a detailed study reporting original research or a review paper. This paper needs to present an advancement and/or contribution to knowledge.
- Those conference participants submitting a paper in a language other than English may submit their paper for consideration according to the above criteria for inclusion in the **Supplementary Section** of the journal *Symposia Melitensia*.

Style Guidelines

Each submission for publication must contain a title, name of author(s), email address(es) and institutional affiliation(s) if applicable, together with an abstract of up to **200** words and **4 to 7** keywords written on the first page. The paper should start from the second page so that the rest of the document would be anonymised. It should be written in such a way that the identity of the author is not evident.

All documents need to be submitted in word format, Calibri 10, single spaced and justified, including references. Authors need to make use of the Harvard style as per link below https://www.um.edu.mt/__data/assets/pdf_file/0007/353662/Harvard_Guide.pdf

Figures and tables should be placed as close to their reference point in the text as possible. All figures and tables must have titles and must be referenced within the text.

All submitted documents must be in black and white including hyperlinks as well as any images and graphs; the latter can only be included if their resolution is higher than 300dpi. All images must indicate their sources and/or copyright permission. Images must be inserted as picture files (.gif, .jpg, .bmp, .pct, .png, .psd). Papers should be submitted only as .doc or .rtf attachments and not in pdf format. If the document is not in line with the above, it will be resent to the author/s.

Conditions for Submission

All submissions for the 2021 edition are expected to reach the Committee by email (symposiamelitensia@um.edu.mt) by **31 October 2020**. In the case of co-authored papers, one author should be nominated to act as the corresponding author with the Scientific Committee.

Authors may suggest the names and email addresses of three referees, however the editor reserves the right to consult other reviewers.

It is assumed that authors have abided by the ethics regulations and procedures of their home institution and country and of the country in which the research was carried out, if this was different. Any submissions to *Symposia Melitensia* must carry a statement to this effect.

It is further assumed that all necessary ethics clearances required were obtained from the appropriate institutional/national bodies before the study was carried out. The Scientific Committee of *Symposia Melitensia* may require proof of this before accepting to publish a manuscript.

Papers submitted to the journal must clearly state that any opinions expressed by the author/s are their own and do not represent the point of view or opinion of the institutions to which the authors are affiliated.

The Scientific Committee reserves the right not to publish a paper on recommendation of the blind peer reviewers; due to issues of plagiarism; or if the research has not been submitted through an established ethics committee.

Authors must only submit work that has not been published previously. Authors are responsible for ensuring that all manuscripts (original or revised) are accurately typed and revised for any grammatical and syntactical errors before final submission. If English is not your first language, kindly make sure that your submitted manuscript is checked by a qualified proof reader.

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Aesthetic Properties and their (Non-)Contribution to Artistic Value

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Abstract

What makes us experience artworks and their aesthetic properties? Can all aesthetic properties be found in all artworks? What aesthetic qualities are required to evaluate artworks? How do we differentiate between aesthetic and artistic values and is there any relationship between the two? This paper aims to answer these questions by examining influential arguments mainly about aesthetic concepts introduced by Frank Sibley and which were later developed by several other contemporary aestheticians including Robert Stecker, Peter Lamarque and Jerrold Levinson.

This paper briefly glances at the historical development of aesthetic properties, from Classical to contemporary times. To avoid speculation and vagueness, the paper proceeds to define some of the aesthetic properties as opposed to non-aesthetic ones and applies them to different literary and visual artworks. Such aesthetic qualities are attributed to a particular experience especially when considering literary works. This aesthetic experience, which includes mainly pleasure, plays an important role in the process of judging and evaluating art. It can also lead to several non-aesthetic values such as the cognitive value which is discussed in this paper. All these conceptions are open to perennial discussion. However, one cannot deny that there is a close connection between the aesthetic and the artistic value which do not exclude one another, especially in the process of identifying and evaluating artworks.

Keywords: *artworks, aesthetic properties, aesthetic experience, artistic value.*

Introduction

When a work of art is produced, it must stand on its own regardless of the conditions in which it was created. This means that to assess its aesthetic nature, the circumstances of the work's origin such as the artist's intentions, when and where it was created, are not important. Such aspects do not contribute to aesthetic judgements. Works of art are what they are and this separation is quite sharp. On the one hand, artworks have their histories and on the other, one can look at works of art as simple objects with various properties which are perceptual - audible properties

especially when speaking about music, visual properties in painting and sculpture, and communicative qualities when it comes to language. Such perceptual properties can be both aesthetic and non-aesthetic, for example the pity and sorrow of an elegy twinned with its metre and rhyme. According to Walton, 'aesthetic properties are features or characteristics of works of art just as much as non-aesthetic ones. They are in the works, to be seen, heard, or otherwise perceived there.' (2004, p.142-3) Walton continues to argue that facts about the artwork's history can be important for aesthetic judgements. Therefore, it would be misleading to claim that a work of art can be simply judged for what can be perceived in it although the idea of judging from the aesthetic viewpoint only can prove to be also right.

For the purposes of this paper, I am going to limit myself only to aesthetic properties. However, reference will also be made to non-aesthetic properties by which I mean the technical aspect of a work of art such as colours, descriptions and rhyme. (Sedivy, 2018) At this point, you must be wondering about which artistic properties can be aesthetic. Most aestheticians agree that perception plays a crucial role in defining aesthetic properties. However, such properties are not only perceptual. As Kivy suggests, 'the core aesthetic properties... are objects of the external senses, principally, but not exclusively, the senses of sight and hearing. And many of those aesthetic qualities that are not perceptual can... be seen to be derivative... on them.' (2011, p.345) Kivy seems to be avoiding the use of the term 'metaphorical.' Aesthetic qualities are crucial when one is evaluating an artwork because they can guide the observer towards its artistic value.

Towards a definition and identification of aesthetic properties

The discussion about aesthetic properties can go on and on without ever reaching a definite conclusion. The reason is that the fundamental concepts which are involved when judging or evaluating artworks are psychological. This means that the aesthetic experience has to do with states of mind. Iseminger identifies two concepts in such a process. In his chapter entitled 'Aesthetic Experience', he refers to the phenomenological concept of aesthetic experience which transmits the feeling of what it is like to go through such a feeling. This concept was discussed by early twentieth-century aestheticians such as Clive Bell and John Dewey but later on, it was dismissed as such theory was not suitable enough to evaluate any artwork. As a result, aestheticians had to develop other related ideas. The second concept is the epistemic perspective of aesthetic experience which according to Iseminger, 'is a conception of a non-inferential way of coming to know something... which deserves to be thought of as aesthetic.' (as cited by Levinson, 2003, p.100) This view seems to be more feasible as recent theories tend to defend the notion of aesthetic experience within this tradition. Beardsley himself, one of the main exponents of aesthetic tradition of the later-half of the twentieth century, began to follow the

phenomenological idea of aesthetic experience. However, later on, his theories evolved in the direction of the epistemic claim after Dickie criticized strongly the phenomenological view.

Accounts of what is distinctive about the aesthetic attitude and experience continued to be elaborated especially from the cognitive viewpoint. Scruton believed that imaginative thought was important for aesthetic experience which forms conceptions of objects. An object, which in this case can be either an artwork or a natural object or phenomenon, must be consciously conceived, otherwise it will lack aesthetic satisfaction. Levinson developed Scruton's theory by stating that the cognitive aspect must be central to aesthetic pleasure. This happens when pleasure 'is grounded in a perception of and reflection on the object's individual character and content.' (Levinson, 2003, p.11) Such a theory implies that the climax of aesthetic appreciation of an artwork lies within the relation between its perceivable form and its resultant character and content.

Actually, it was Frank Sibley who further developed this relation of qualities in his essay 'Aesthetic Concepts'. He claims that the observer's sensitivity is extremely important. When looking at a particular painting, the observer might comment on the shades of colours or on the scenery or figures. Such non-aesthetic qualities which any observer can visualize in a painting, can become the basic references of aesthetic qualities if observed by an individual with a developed sense of taste because they can go beyond the painting itself and perceive what is not actually represented in the picture, for example a sense of serenity. Therefore, aesthetic concepts require taste or sensibility in a much higher degree than normal so that they can be applied correctly. Moreover, Sibley believes that aesthetic concepts are 'non-condition-governed' in that 'there are no non-aesthetic features which serve in any circumstances as logically *sufficient conditions* for applying aesthetic... terms.' (2004, p.128)

I fully agree with Sibley's belief that aesthetic judgements require taste, perception or sensitivity. On the other hand, I have my doubts about his statement about aesthetic qualities which are not governed by any condition. In fact, I do not attach much importance to this matter. It is more necessary to establish whether aesthetic properties are perceptual or not so that artworks can be more appreciated and valued.

Sibley, who fully supports the epistemic view of aesthetic experience, emphasizes the fact that to reach aesthetic enjoyment, appreciation and judgement of artworks, one has to perceive the artwork for themselves. This can happen at once or after several readings, viewings or hearings or by the help of critics. Ultimately they have to be involved when they feel the power of a novel or see the unity of a work or notice a particular colour scheme. Sibley believes that to learn from others about such sensibility is not enough to value artworks. It is the observer him/herself who has to be struck by these qualities as perception cannot be transferred from an individual to another. Perception helps the individual to reach aesthetic value

(2001, p.34). According to Sibley, without aesthetic perception, one cannot make an aesthetic judgement.

Sibley's theory has two important aspects. The first one is the epistemic aspect which highlights specific features in an artwork through its direct experience, that is by perceiving it directly. This brings to mind Kant's claim in his *Critique of Judgement* when he stated that 'People wish to subject the object to their own eyes...' (2007, p.50). Since I have already referred to this epistemic claim, I am going to discuss the other aspect of Sibley's theory which in my view, can be referred to as the ontological aspect. This aspect emphasizes the aesthetic experience one goes through when defining aesthetic properties. The fact that direct perceptual acquaintance is needed to appreciate and enjoy aesthetic properties is uncontroversial. But here, Sibley is stating that aesthetic properties are perceptual properties. It is actually this statement which concerns me and which brings to my mind this two-fold question: Are aesthetic properties necessarily perceptual ones and what does a perceptual property mean? For example, in a poem, I can perceive the redness in the sky during sunset, I can perceive one's point of view and I can also perceive the feeling of sorrow associated to the setting. This example demonstrates three different experiences of perception.

Undoubtedly the dominance of sight and hearing is evident in Sibley's theory of aesthetic properties. This means that his interpretation of perception is to perceive through the five senses. Such a belief reminds me of Baumgarten's *Reflections on Poetry* in which he distinguished between 'to know' and 'to perceive': the former has to do with the superior faculty of logic while the latter refers to the inferior faculty of perception (1954, p.78). At this point, I agree with both Peter Kivy as well as James Shelley when the latter wrote 'Sibley does not claim here that aesthetic properties necessarily depend on 'perceptual entities' or 'appearances'. His main point is merely that aesthetic properties are perceived.' (2003, p.371) I understand here that by the term 'perceived', he means to experience through direct engagement with the artwork which involves one or more of the five senses.

Aesthetic experience

Similar to his contemporary aestheticians, Lamarque claims that while no one denies that art offers some kind of experience, the nature of that experience is a 'perennial controversy.' (2009, p.19) While discussing the aesthetic experience of literature, he maintains that such an experience might take the form of detachment which does not help in the evaluation of literature. Lamarque seems to agree with Livingston who believed that aesthetic experience includes thought, imagination, perception and sensation. When it comes to literature, he argues that perceptual experience is not essential to literary value. This idea suggests that literature, especially poetry, goes beyond sensual perception. In order to attain the full

appreciation of a literary work, the meaningful content must engage the reader. Non-aesthetic properties such as the pleasant sounds of a poem when read aloud and its layout on the page, do not contribute much to its literary value. Hence, thought and imagination can make the experience stronger. But can thought and imagination be considered as aspects of aesthetic experience? Aesthetically speaking, such an experience is related to perception. However, when applied to literature which is the art of language, perception is not always conscious. As Lamarque claims, 'reading is not characterized by any particular feeling or sensation but there is a kind of 'appreciation' which draws attention to literary mechanisms similar to aesthetic experience.' (2009, p.20)

Aesthetic properties are important for the aesthetic experience especially when considering literary works. Frank Sibley listed a number of concepts such as balance, serenity, unity, vividness and so on, which he considered as aesthetic aspects of artworks including literary works. When analysing such concepts, it becomes clear that aesthetics is not only about beauty but that it goes beyond this conception. Talking about beauty nowadays is quite outdated. Sibley shows that aesthetic qualities are not always relevant to evaluate artworks. However, they can lead to several effects such as the particular appearance of a work, its salient features, the impact it leaves and what features merit aesthetic attention. These aesthetic descriptions interact with the aesthetic qualities. In the literary context, these qualities become more evident and they surpass mere sensory perception. As Lamarque suggests, '[a] mere grasp of the language is not sufficient to appreciate a work aesthetically.' (2009, p.20) I agree with this statement because the reader must go beyond his linguistic competence, implying that literary appreciation needs 'a trained mode of discernment.' (2009, p.21) This means that the reader is involved in the literary work's unity, its quality and its achievement.

Sibley seems to draw a clear line between aesthetic and non-aesthetic properties with no relation between them whatsoever. According to him, non-aesthetic properties, whether they are structural, grammatical or physical, stand on their own without any dependence on the aesthetic ones. Keeping in mind that Kivy has challenged strongly the idea that aesthetic properties are not condition-governed, in literature, aesthetic features cannot be found in textual mechanisms only. For example, we cannot conclude that a poem is effective and moving simply because we can identify a number of metaphors, repetition, imagery and rhyme patterns. Moreover, these non-aesthetic qualities are not proof enough that the work is literary. The artistic or literary status of a work does not depend on its appearance.

In the literary context, there is no general rule which links linguistic features such as syntax or meanings to literary aesthetic achievement. A mechanism that is suitable for a particular novel may not function well in another. This means that aesthetic judgements cannot be generalized. It is wrong to claim that the aesthetic properties of literary works relate closely to formal features. An aesthetic approach does not depend on formalism. Literary works are not an end in themselves a means to some

effect or other. According to Lamarque, 'formal... devices are in themselves textual features... They acquire aesthetic significance only when assigned a function within an artistic structure.' (2009, p.22) Therefore, any formal or rhetorical devices do not possess intrinsic aesthetic value. However, they do contribute to a particular end. Such mechanisms may be also found in non-literary texts such as texts containing information. The end-result of these devices is different as in this case, they do not produce aesthetic pleasure. Textual features alone do not lead to appreciation, but their effect and inter-relationship within a literary context can conduct to the evaluation of literature.

Artistic Value

According to Ingarden (1987),

artistic value... is something which arises in the work of art itself and has its essential ground in that. Aesthetic value is something which manifests itself only in the aesthetic object and as a particular moment which determines the character of the whole' (p.14).

One can deduce from Ingarden's statement that there exists an interdependence between the value of art and aesthetic value. In fact, Stecker agrees with this idea when he rejects the theory of formalism, claiming that besides being out-dated, it is inadequate as it fails to specify the aesthetic value of art. (2003, p.312) He states that aesthetic value helps to identify artistic value and that there are three different ways to do so which include (i) the aesthetic properties of an artwork, (ii) the aesthetic experience which the artwork provides and (iii) the characteristic pleasure which is derived from the work itself. The last two characteristics go together as an aesthetic experience is typically pleasurable. Also such an experience is derived from a close observation of the artwork.

It seems that the essentialist conception identifies artistic value with aesthetic value. Lamarque and Olsen introduced the idea of appreciating literature as literature when the reader goes through a stance in search of a certain kind of value. However, it is not clear that all artforms can be defined by this theory. We must be aware that art is not replaceable. Therefore, we need to interpret the artistic value in the unique experience art can offer. This is the reason why artistic value is closely related to aesthetic experience. On the other hand, it is undeniable that art can be valuable in a non-aesthetic way because art can possess a significant cognitive value. Stecker summed up this idea very clearly when he stated that 'art is instrumentally valuable beyond the provision of experience valued for its own sake.' (2003, p.315) Hayman and Budd do not agree with Stecker as they believe that art is unable to do this or is unreliable to do this. Their conclusion is obvious: artistic value must be only limited to the aesthetic.

But can art possess cognitive value which is distinct from aesthetic value? Actually, cognitive value is a non-aesthetic value. A number of aestheticians such as Collingwood, Danto and Goodman, are in favour of art having some sort of cognitive value, whether direct or indirect. Cognitive value may include different ways of thinking, imagining or perceiving. All these are intellectual benefits which help the observer form concepts which are related to an experience of the artwork. For example, experiencing a particular emotion on reading a poem can help the reader identify certain emotions which of which they were not aware, thus leading to new self-knowledge.

If art is capable to transmit knowledge which forms a conception, this may mean that in reality this concept can be either true or false. This claim can be doubtful for a number of reasons. The first one is about the evidence art can provide to demonstrate that its concepts are true. If art cannot provide such evidence, then it cannot communicate knowledge. According to Stecker, 'the cognitive value of art lies in providing new ways of thinking or perceiving or bringing home to us the significance of already familiar ways.' (2003, p.316-7) Secondly, where should one search for artistic value? The concepts presented by a work may eventually result in either familiar truths or obvious falsehoods. Emphasizing too much on truth and falsehood is wrong because artworks cannot be reduced to simple morals. Artworks tend to present particular situations and characters. But to contribute to the search for knowledge, they must present sufficient generality that goes beyond the artworks themselves. The final reason is about the topic of replaceability as mentioned previously. Can we acquire knowledge from other ways than art? If the answer is in the affirmative, it means that art is not indispensable. Keeping in mind that what we appreciate is so closely related to the experience of the work and its mode of expression, the artistic value in this case, is irreplaceable as is its aesthetic value.

Final Remarks

As Alcaraz León states, there is no common factor which can properly demonstrate that aesthetic merits always contribute to moral or cognitive values (2018, p.25). However, it is quite reasonable to say that many artworks possess cognitive value, whether direct or indirect. Moreover, this value forms an essential part of the artwork both from the creator's point of view and from that of the audience. At this point one has to be careful not to identify a work's artistic value with its cognitive one. A case in point are musical compositions. If some of these works have cognitive value, for sure this could hardly be their most important value. Stecker states that 'we have no reason to dismiss aesthetic value as part of artistic value.' (2003, p.317) This statement implies that not all artworks can possess both kinds of value and also that the topic of artistic value has not yet been exhausted because there are

several other types of value that can be found in artworks such as the emotional response of the audience to a particular work or, from the historical perspective, the work's contribution to the development of art, which can result in a particular form or genre. Such concepts of artistic value are pluralistic and go much beyond the essentialist conception. Artistic value is valuable in an artwork if such a possession leads to the artistic value of the work itself. This idea helps in distinguishing artistic value from non-artistic value. Such a distinction can also be reached when, in the process of identifying art, one also identifies artistic value.

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Bio-note

Dr Josette Attard is Senior Lecturer at the University of Malta Junior College and the University of Malta. She studied literature and literary theory at the University of Malta where she specialized in literary aesthetics for which she was awarded a Doctor of Philosophy. Her research interests are the philosophy of literature and literary aesthetics. Her main publications in this field include *L-Estetika Maltija – Antologija Kritika* (1997), and *Storja tal-Estetika Letterarja Maltija* (2011). She is a member of The British Society of Aesthetics, the Società Italiana di estetica, the European Society of Aesthetics and the American Society of Aesthetics. She also presented several papers in conferences and was twice awarded the National Book Prize.

Primary Children's Understanding and Relationship with Cartoon Characters: A Multimodal Praxis-based Research Experience

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Abstract

This paper presents the research outcomes of a two-year research venture conducted by Attard (2019) which links theory to classroom-based praxis. In brief, the first part of the paper presents a sound theoretical grounding based on international literature about primary school children's understanding and relationship with cartoon characters. Later, based on the critical theoretical literature review presented in the first part, the paper links the outcomes to two levels of praxis. Initially, it presents how nine / ten-year-old children attending Maltese primary schools understand and relate to cartoon characters based on their everyday cartoon watching experiences. Then, based on an original multimodal framework (Cremona, 2017), as a main conclusion, a set of practical multimodal suggestions are proposed. These suggestions are intended to be used by educators, parents or guardians with primary school children.

Keywords: *primary education, cartoon characters, children's expressions, pedagogical praxis.*

Introduction: A comprehensive definition of cartoons

Cartoons can be defined as works of art produced in the form of drawings, illustrations or animated films which give colour, form and character to the most varied and imaginative sense of fable or reality itself (Jensen, 1997). This paper focuses on animated cartoons which are distinguished from other cartoons by the use of animation to give life to cartoon characters (Dobson, 2009). According to Wells (2008), cartoon characters are phenomena, because they are able to represent diverse beings, personalities, entities and identities. These characters have been featured on animated cartoon channels such as Cartoon Network, Nickelodeon, Boing and in commercialised animated films, such as Disney films, Warner Brothers films, Dream Works films, and Fox films (Ahmed & Wahab, 2014).

Animated cartoon characters allow animators to depict performances of gender, sexuality, racial and national traits which challenge how we think about

ourselves (Wells, 2008). Yet, several publications have criticised the portrayals of these animated characters as depicting both positive and negative stereotypes (Harriger et al., 2018). Lacroix (2004) and Giroux (1999) also add that animated cartoons influence children's values, attitudes, beliefs, and behaviour. This is especially important considering that the extent to which children consume media has increased over time (Marsh, 2014). Research indicates that animated cartoon watching influences children's diet and snack preferences (Naderer et al., 2018) and that exposure to violent and aggressive cartoons has a negative influence on children's behaviour (Wiedeman et al., 2015). Despite these negative influences, de Leeuw & van der Laan (2018) suggest that Disney animated films motivate children to help their friends when they watch such portrayals and that children can learn morality from animated cartoons. In fact, when children observe a cartoon character to be prosocial i.e. doing actions which benefit another character (Padilla-Walker et al., 2013), they want to behave or be like their favourite cartoon character, a process which is known as wishful identification (Hoffner, 1996). As children watch animated cartoons, they also develop other emotional connections or imaginary relationships with animated cartoon characters which can be both positive and negative and which are known as parasocial relationships or interactions (Jennings & Alper, 2016). Hoffner (1996) indicates that children's wishful identification and parasocial interaction with cartoon characters are dependent on the animated cartoon characters'; attractiveness, humour, intelligence, strength, and social behaviour. Furthermore, children's parasocial interaction with cartoon characters is positively associated with the extent to which a character is likely to occur in the real world (Rosaen & Dibble, 2008).

During cartoon watching, apart from developing parasocial relationships with cartoon characters, children also acquire values, images, signs and symbols of culture (Andrienko & Kulikovskaya, 2017). The knowledge which children acquire from watching animated cartoons shapes their ideas of the world outlook, which continues to evolve later throughout their educational experiences (Veresov & Kulikovskaya, 2015). As children watch animated cartoons, they acquire morality through the moral messages represented in cartoons, which can be strengthened by parents and guardians (de Leeuw & van der Laan, 2018). While children make meaning of animated cartoons, they learn how to use multiple channels of communication (e.g. *images, speech, gestures*, etc.) which are referred to as modes (Kress, 2010). As children communicate distinctive types of meanings through different modes, it helps them to develop their critical literacy (Lenters, 2018). In fact, animated cartoons significantly increase primary students' knowledge and understanding of specific concepts, their motivation, as well as their analytical and literacy skills (Dalacosta et al., 2009). Furthermore, the educational values, applications, and uses associated with cartoons highlight the importance and relevance that this art form has in the educational context, especially in improving primary children's learning experience and educational praxis (Ajayi, 2011).

In light of the critical literature review presented, this paper addresses the questions:

1. How do primary children understand and relate to animated cartoon characters?
2. What are the practical classroom-based multimodal suggestions that can be derived from the outcomes of the former research question?

Methodology

In order to answer these research questions, the concurrent nested approach (Creswell, 2003), a mixed-methods approach that gives prevalence to the qualitative method, was adopted. This model was chosen in order to obtain an in-depth insight of primary children's understanding and relationship with cartoon characters based on ethnographic principles (Creswell, 2013). For this reason, triangulation of data was achieved through different praxis-based activities which were carried out with nine / ten-year-old children attending Maltese primary state schools. These activities included questionnaires, drawings and writings, semi-structured interviews and cartoon watching. The students' expressions and interpretations provided during these praxis-based activities were important in order to derive pedagogical suggestions, which can then be applied in educational praxis.

Ethical clearance was obtained from the Faculty Research Ethics Committee (FREC) at the University of Malta and permissions were granted by the Directorate for Research, Lifelong Learning and Employability and the Foundation for Educational Services (FES) to carry out the study in different primary state schools. Then, the activities were carried out with ten Year 5 students who had previously developed positive and negative parasocial relationships with animated cartoon characters and who were selected through a multi-stage sampling strategy (Newby, 2014).

The ten students selected through multi-stage sampling participated individually in the data collection activities, which occurred in the students' natural setting so that they feel comfortable and at ease. The students were provided with a blank A4 paper and a set of pencil colours to draw a cartoon character of their choice. Then the students were provided with a foolscap paper on which they needed to describe the character of their choice and how they feel towards it through writing. The students spent around 30 minutes on the drawing and writing activities. During these activities, field notes were taken in order to note any ideas or descriptions which the students shared about the character that they chose. Following these activities, the children who assented participated in a short semi-structured interview in which they described their drawings and elaborated their interpretation of the cartoon character which they chose and how they feel towards it. The semi-structured interviews took around 10 minutes, during which time the students had complete control of the audio recorder which was used to record the interviews. Finally, the

students were offered the opportunity to watch 5 minutes of an animated cartoon of their choice, in which the character that they described is featured. During this time, the students further elaborated their interpretations about the cartoon character and the students' verbal expressions were recorded as field notes (Flick, 2018).

The students' verbal expressions recorded as field notes and audio recordings were transcribed and analysed using thematic analysis following the generic process described in Creswell (2003). Transcripts of interviews, which were conducted in Maltese, were translated using the backward translation technique (Nurjannah et al., 2014) for comparability purposes. In order to critically analyse and compare the students' interpretations, the MIRROR multimodal framework (Cremona, 2017) was used. The first four steps of this framework include monitoring and providing an in-depth multimodal social semiotic interpretation of the texts and drawings which the students did during the praxis-based activities. The other two steps of the framework involve the organisation, comparison of interpretations and the representation of outcomes derived from the framework. Although this framework was developed for critically analysing text for foreign language teaching and learning, it can be easily adapted for the critical analysis of other texts, including those relating to cartoon characters. Furthermore, as indicated in Cremona (2017), it has associated pedagogical applications and takes into consideration both multimodal and social semiotic perspectives which rarely feature in other frameworks. The data analysis outcomes were then used to propose multimodal suggestions, which consist of pedagogical activities related to cartoon characters based on the students' interests, to be used by educators in their pedagogical praxis or by parents or guardians with their children at home.

Data analysis and findings

Analysis of the students' interpretations suggests that children understand cartoon characters in terms of the characters' identity and portrayal, attitudes and behaviour, nature and character, features and attributes, living environments, and social relationships. The analysis also suggests that the students relate to cartoon characters in different ways depending on these cartoon characters' features and characteristics. In agreement with Jennings and Alper (2016), the students in this study described both positive and negative parasocial relationships which they had formed with animated cartoon characters. Four students in this study, three who had formed a positive parasocial relationship and one who had formed a negative parasocial relationship with cartoon characters suggested that according to them these characters exist in reality. In fact, a student who drew and described the animated cartoon character *Bill Cipher* (Figure 1) from the animated cartoon *Gravity Falls* (Hirsch, 2012) stated:

"I believe that Bill Cipher is real, because I saw a lot of people who took photos with him and uploaded them... on the internet... This means, he is real."

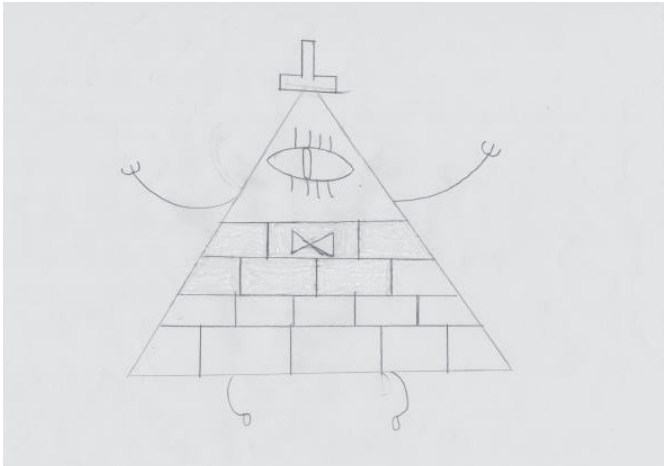


Figure 1. Drawing of Bill Cipher produced by a student in this study.

Another student who drew and described *Mickey Mouse* (Figure 2) from the animated cartoon *Mickey Mouse Clubhouse* (Parkins et al., 2006-2016) stated that *Mickey Mouse*

"does things which I cannot do, so... like, like... instead of me doing them (the), he does them... and... he shows them in cartoons".



Figure 2. Drawing of Mickey Mouse produced by a student in this study.

The students' statements also indicate that the students wishfully identify themselves with the animated cartoon characters which they described. For example, during the interview a student stated:

"...I would do as they do",

while referring to *Ladybug and Cat Noir* (Figure 3) from the animated cartoon *Miraculous: Tales of Ladybug & Cat Noir* (Astruc et al., 2015).



Figure 3. Drawing of *Ladybug* and *Cat Noir* produced by a student in this study.

Another student stated that he would like to live in a tree house as *Finn* and *Jake* (Figure 4) from the animated cartoon *Adventure Time* (Leichtner, 2010).

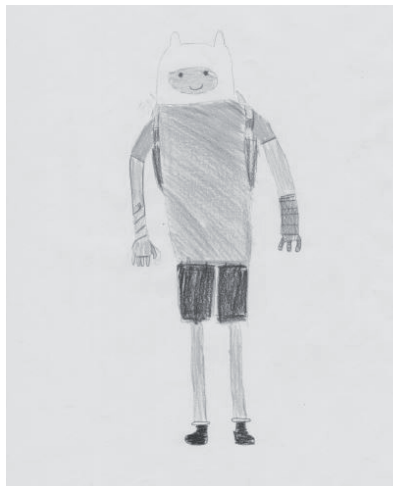


Figure 4. Drawing of *Finn* produced by a student in this study.

Apart from children's wishful identification with cartoon characters, the results indicate that children may become addicted to cartoons and cartoon character merchandise. For instance, a student described her addiction to watching unicorn cartoons stating:

"When I started watching it for the first time, I got addicted and I still watch it to this day." The student also added, "*I have a soft toy which is a unicorn. Its name is Emma, and I have had it for 7 weeks... My mum noticed me drawing them a lot, and she bought it for me, and I became fixated about unicorns.*"

This student's interpretation provides an indication of the important role that parents, guardians and other adults responsible for children have in monitoring the content of animated cartoons that their children watch.

The findings also seem to suggest that children's exposure to violent or aggressive cartoons can negatively impact children's values, attitudes, and behaviour (Wiedeman et al., 2015). The student who described *Bill Cipher* (Figure 1) from the animated cartoon *Gravity Falls* (Hirsch, 2012), produced for Disney Channel and Disney XD, explained that this animated cartoon character is

"really really really evil".

She also added that *Bill Cipher* is referred to as a

"one-eye demon"

because it possesses several powers. For example, the student explained that

"It can instantly burn whatever it wants"

and

"it can kill instantly, in a second, it kills".

During the interview, the student also described a story which suggests the demonic power of *Bill Cipher* in possessing humans, including children. The student explained:

"The children had puppets and *Bill Cipher* came for a boy. The boy was entering a password. *Bill Cipher* told him that he can tell him the password but he had to give him a puppet. He was referring to the boy's soul. Then they made a deal, and he removed all of the boy's soul and entered his body, but the boy was still alive but he was a ghost."

Despite the child's understanding about this cartoon character and his demonic powers to make deals involving the soul, during the informal interview she stated:

"...my dream is to go to America, search for it and have an adventure. Adventure, even if it's dangerous I don't care". "I'm not afraid of it... It will be my pleasure because he will be real and he will enter my mind and sees everything... Because it would have entered my mind, I will know that it is inside my mind, and... sort of because I really love it, and I want him to enter in my mind."

This case demonstrates the complexity of children's understanding and relationship with cartoon characters as the child loves this cartoon character but does not care about the dangers which such an adventure of making a deal involving the soul might have on her. Furthermore, this case also suggests that educators

and parents need to consider how animated cartoons, including those produced by Disney, influence children's culture, attitudes, values, beliefs and behaviour, as indicated by Giroux (1999).

Conclusions

In light of the outcomes from the data analysis and the theoretical critical literature presented, multimodal pedagogical suggestions that can be held in educational praxis with primary children are proposed. The portrayal of the animated cartoon characters which the students drew and described can be used during a Mathematics lesson when teaching 2D shapes. For example, by providing students with pictures of *Bill Cipher* and *Mickey Mouse* or letting the students draw these characters, educators can enable students to deduce the shapes which these cartoon characters are made of. For instance, the general shape of *Bill Cipher* (Figure 1) is a triangle, however, it is composed of several internal rectangles as well. Likewise, *Mickey Mouse's* (Figure 2) ears are circular whilst his eyes and nose are oval-shaped. For students who do not like animated cartoons, educators can show pictures of fictitious castles or playgrounds or let the children draw patterns out of different shapes. The educator can then ask the students to find objects in the classroom which have these shapes, so that the students can find these shapes in praxis within the classroom. Since the findings indicate that children understand cartoon characters in terms of their identity and portrayal, it can be concluded that this resource is suitable for teaching the topic of 2D shapes.

When teaching languages, educators can make use of children's understanding of the cartoon characters' identity and portrayal, attitudes and behaviour, nature and character, features and attributes, living environments and social relationships. The students can form mind maps using a picture of the character of their choice and write what they know about the character, as shown in the example in Figure 5. In this way, students will be making use of the modes of *image*, *writing*, and *layout*.

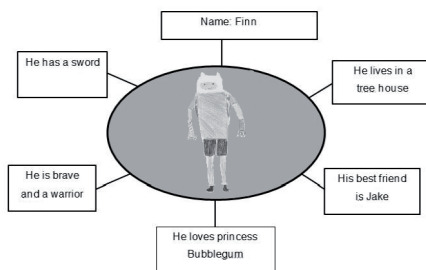


Figure 5. An example of a mind map with information which a student provided in this study about the animated cartoon character Finn (Attard, 2019).

From the mind maps which the students create, they can learn to write interviews by asking questions about cartoon characters, football players or any other characters of their choice, and provide answers through *writing*. This is because the findings suggest that not all students form positive parasocial relationships with cartoon characters, yet the students understand cartoon characters in terms of their features and characteristics.

Since the findings indicate that children may become addicted to cartoons and cartoon character merchandise, educators and parents may choose to motivate children to use such merchandise for educational purposes, as part of imaginative play or to create an animation video. The children need to set up the characters, take a picture with a still camera, move the characters slightly and take another picture. The process is repeated until there are enough pictures to create short animation videos which give the impression that the characters are moving. Since not every student might have access to such technology, students can produce drawings of their cartoon character merchandise, design new cartoon characters or participate in story-telling activities with their cartoon character merchandise. This way, children will be making use of different modes, including *image*, *colour*, *speech*, and *gesture* as well as improving their creative skills during integrated Art and language lessons.

These pedagogical suggestions may help educators and parents to motivate and engage children by carrying out these educational activities related to the children's interests. Furthermore, since the findings indicate that exposure to violent and aggressive cartoons may influence children's attitudes and behaviour, such activities might help primary students to be critical about the content represented in animated cartoons. In order to account for the students' different interests, experiences and relationships with cartoon characters, some of these activities might need to be adapted accordingly. Therefore, it is encouraged that educators use their creativity to develop lessons which include cartoon characters based on their students' interests and experiences, to enhance the students' learning experience in educational praxis and to help them reach their potential for academic success.

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Bio-notes

Robert Attard is a postgraduate student who obtained his bachelor's degree in Biology and Chemistry (Honours) from the University of Malta. Currently, he is in his final year reading for a Master's degree in Teaching and Learning in Early Childhood and Primary Education. In his Master's dissertation, he conducted research which aimed at understanding how primary children understand and relate to cartoon characters and how such an understanding can contribute to practical educational implications. Recently, he was recruited as a primary teacher in the Education Sector within the Ministry for Education and Employment.

Dr George Cremona is the Coordinator for German programmes offered by the Faculty of Education at the University of Malta. He lectures in German language teaching methodology and gives lectures about Multimodality. He also coordinates the Media Literacy VET Programmes of the Faculty of Education which he has been a member of since 2009. He has also been working on a research project series called 'Multimodality in Practice' since January 2012. This project aims to implement Multimodal concepts and theories in practice particularly in schools and through the media (i.e. radio and television programmes as well as the internet). For this, he was awarded the prestigious IGM national award in 2017 and 2019.

Analysis of the Discrimination Index of Final Biology Examinations in Malta

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Abstract

Item analysis is a range of statistics that helps to determine the effectiveness of each item in an examination. It plays an important role in contributing to the fairness of the examination as well as helps to identify content areas that may be problematic for students. The validity and reliability of an examination finally depend on the characteristics of the items. Item analysis permits a high reliability and validity to be built into a test in advance. Discrimination index (D) is part of item analysis that measures the difference in item difficulty between groups of students with high and low marks. The index varies between -1 and 1 where the item ideally should be between +0.3 and +1.0. A highly discriminating item is indicative of students who gained high tests scores got the item correct whereas those who had low test scores got the item incorrect. The objective of our study was to calculate the discrimination indices of Advanced level Biology final examinations at a public post-secondary institution in Malta. The final scores obtained by first-year students over a five-year period (n = 1315), 2014-2018, in Papers 1 (short-type items) and 2 (comprehension, structured and unstructured essays) were used to calculate the discrimination index for each item. Results are encouraging since negative discrimination, indicative of a defective item, were not observed in any of the items. Paper 1 is better at discriminating between high and low achievers since over the study period, 93% of the items had acceptable (D between 0.2-0.29) or good discrimination (D between 0.3-0.39) while less, 54%, in Paper 2. Also, fewer (5%) of the items in Paper 1 had poor discrimination (D < 0-0.19) but 46% in Paper 2. Results show that comprehension items are better than the essay type to discriminate between high and low achievers. This finding may be used to start a discussion at the institution to consider the validity of the essay-type of items in final Biology examinations.

Keywords: *Biology, Discrimination index, Malta, Post-secondary.*

1. Introduction

Item analysis is a process that examines learner responses to individual test items in order to assess the quality of those items and of the test as a whole.

Discrimination Index (D) is an instrument to measure the difference in item difficulty between groups of students with high and low marks. Item discrimination power has been described by MacDonald et al., (2002) to indicate the extent of an item to differentiate students with different ability levels. Analysing the discrimination indices of each item provides information regarding what the students have learned and enables teachers to determine and correct the faulty items. The calculation of the discrimination index provides a valuable tool in designing the test. Many studies encountered in the literature investigate multiple choice items as this is a widespread method of student assessment in colleges and universities. According to Khan et al., (2015), there are very scanty studies of on essay type, structured essay type and short answer type questions. These authors and Johari et al., (2012) have applied it to essay type, structured essay type, and short answer questions.

The discrimination index varies between -1 and 1, where the item should have a positive discrimination index of at least 0.2. If the item equals to 0, it means that there is no discrimination. However, items with negative indices need to be revised. Over twenty discrimination indices exist in the literature that may be applied to multiple choice or subjective items. The discrimination index for subjective items used in this study follows the calculation as used by Johari et al., (2012):

$$\text{Discrimination index} = \left[\frac{\sum H - \sum L}{N(\text{Score}_{\max} - \text{Score}_{\min})} \right]$$

H = total score for 25% of students in the high achievement group.

L = total score for 25% of students in the low achievement group.

N = 25% of total numbers of student tested.

Score_{max} = maximum (full) marks for the item.

Score_{min} = minimum marks for the item.

If the test and an item measure the same ability or competence, it would be expected that those having a high overall test score would have a high probability of being able to answer the item. Thus, a good item should discriminate between those who score high on the test and those who score low. Table 1 shows the discrimination values and their corresponding interpretation and recommendations as described by Ebel (1972).

Table 1. The discrimination values and their corresponding interpretation and recommendations as described by Ebel (1972).

Discrimination Index	Description	Recommendations
D = negative	Defective Item	Rejected or improved
D < 0-0.19	Poor discrimination	Poor items to be rejected
D between 0.2-0.29	Acceptable discrimination	Marginal items usually need and subject to improvement
D between 0.3-0.39	Good discrimination	Reasonably good but subject to improvement
D = 0.4	Very good discrimination	Very good items; accept
D > 0.4	Excellent discrimination	Very good items; accept

2. Objectives of The Study

To find:

1. the mean discrimination index of Biology Papers 1 and 2 examinations taken by Maltese post-secondary students over the period 2014-2018.
2. the discrimination index of each item in both papers.
3. if the discrimination index of Paper 2 items (comprehension, structured essay and unstructured essay) differs.

3. Methodology

This is a retrospective study based on final examination scores attained by first-year Biology Advanced students attending a public post-secondary institution. The entire cohort (n = 1315), including both male and female students, attending the institution over the period 2014-2018 was investigated. The number of students attending the institution varied with the year investigated, and ranged from a maximum in 2014 (n = 315) to a minimum in 2018 (n = 215) (Table 3). Student scores provided by the Biology Department were written against an index number. Data was entered in a Microsoft Excel 2010 sheet to allow the computation of the discrimination index as explained previously. The list of scores obtained for Paper 1 was arranged in a descending order. The sum of the scores for the top 25% of the student population [$\Sigma(H)$] and that for the bottom 25% [$\Sigma(L)$] were obtained. The discrimination index was then calculated as per equation given in the introduction. The same exercise was repeated for Paper 2 results. SPSS version 24 was used to analyse the data.

3.1. The Examination

Details of the set-up of the Biology examination papers that students sat for are shown in Table 2.

Table 2. Total marks, and type of item and answer for each paper. Each paper lasts 3 hours.

Paper	Type of item	Type of answer	Total number of marks
1	Short	Compulsory	100
2: Section A	Comprehension	Compulsory	25
Section B	Structured essay	2 to choose 1	25
Section C	Unstructured essay	4 to choose 2	50

4. Results and Discussion

4.1 Research objective 1

To find the mean discrimination index of Biology Papers 1 and 2. According to Anigbo (2015), the ideal discrimination index is between +0.3 and +1.0. Table 3 shows that the mean discrimination index of Paper 1 examinations ranged between 0.29-0.35: being of acceptable discrimination in 2015 and good in the other four years investigated. However, for Paper 2, it was poor ($D = 0.19$) in 2016 and 2017 and acceptable (D between 0.2-0.29) in the rest. Thus the mean discrimination index for Paper 1 was ideal in four out of five years but never for Paper 2.

Table 3. The mean discrimination index and standard deviation of Papers 1 and 2 over the five-year study period.

Year	Number of students	Mean and Standard deviation of the Discrimination Index & Description	
		Paper 1	Paper 2
2014	315	0.33±0.073 (Good)	0.20±0.122 (Acceptable)
2015	276	0.29±0.062 (Acceptable)	0.21±0.136 (Acceptable)
2016	232	0.30±0.081 (Good)	0.19±0.094 (Poor)
2017	277	0.34±0.058 (Good)	0.19±0.068 (Poor)
2018	215	0.35±0.085 (Good)	0.21±0.122 (Acceptable)

4.2 Research objective 2

To find the discrimination index of each item in Papers 1 and 2. An item answered correctly by low achievers but not by the high achievers possesses negative discrimination. Results of the discrimination index for final Biology papers are encouraging as no negative values were observed in Paper 1 (Table 4) and Paper 2 (Table 5). Items with a negative discrimination index are useless and reduce the validity of the test. An item which does not discriminate between the upper and lower achievers, contributes nothing to the establishment of an order of merit.

Over the whole study period (Table 4) the percentage of Paper 1 items could be classified as follows:

- 7.1% (4 items out of 56) had poor discrimination ($D < 0.0.19$);
- 26.8% (15 items out of 56) had acceptable discrimination (D between 0.2-0.29);
- 50.0% (28 items out of 56) had good discrimination (D between 0.3-0.39);
- 1.8% (1 item out of 56) had very good discrimination ($D = 0.4$);
- 14.3% (8 items out of 56) had excellent discrimination ($D > 0.4$).

Thus, over the five-year period investigated, the majority of the Biology Paper 1 items were able to discriminate and were valid. Due to the nature of the question given, the probability of weak students to give answers on guessing basis was eliminated. According to Brown (1983) and Crocker & Algina (1986), if $D > 0.2$, the item is acceptable and able to discriminate between good and weak students. If this information is applied to Paper 1 items (Table 4), 93% (52 out of 56 items) fall in this category. Figure 1 is a plot of the percentage of items in each year classified by the description of the discrimination index. The figure indicates that over the years, especially from 2016 to 2018, there is a shift for more items to be classified as having good to excellent discrimination. The more items classified as highly or moderately discriminating, the better the test (Ebel & Frisbie, 1991). Khan et al., (2015) note that although essays, structured essays and short answer questions are frequently given in examination, they are studied to a lesser extent compared to multiple choice questions. Results obtained in this study resemble those of Khan et al., (2015) in two ways. The first is that no negative values were obtained and the second, that a comparable percentage of items having a discrimination index of 0.2 and above. In this study 93% were like so and 87.5% in the study by Khan et al., (2015).

Table 4. The discrimination index for each item (total 56) in Paper 1 classified by year. Values in bold type are greater than 0.3 (good discrimination and better).

Item	2014	2015	2016	2017	2018
1	0.28	0.35	0.27	0.46	0.29
2	0.35	0.31	0.44	0.35	0.43
3	0.45	0.26	0.26	0.34	0.49
4	0.37	0.32	0.20	0.27	0.45
5	0.40	0.18	0.26	0.31	0.37
6	0.36	0.32	0.20	0.31	0.33
7	0.30	0.31	0.21	0.43	0.37
8	0.15	0.16	0.41	0.29	0.19
9	0.38	0.29	0.32	0.32	0.29
10	0.24	0.33	0.39	0.31	0.31
11	0.39	0.36	0.29		
12	0.35				
13	0.32				
14	0.29				

Figure 1. Percentage of Paper 1 items classified by the description of the discrimination index for each year investigated.

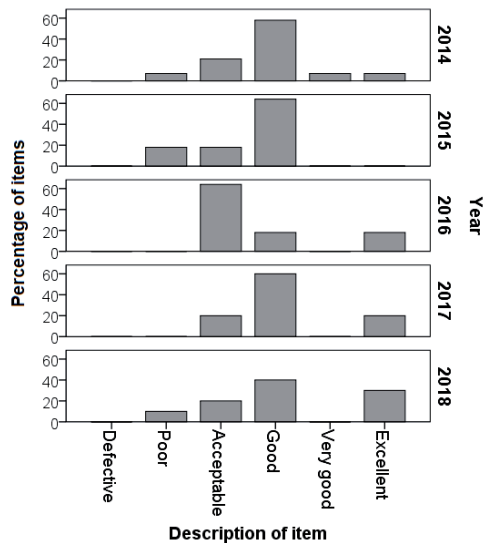
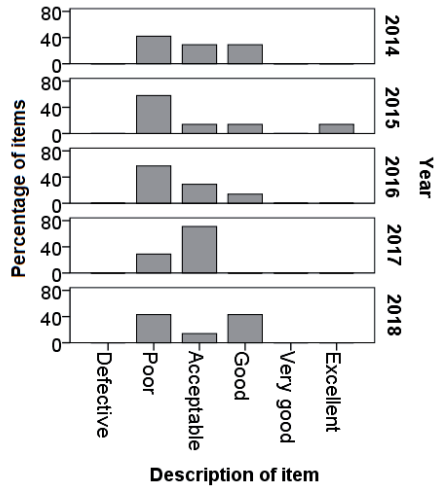


Table 5 shows that no Paper 2 items with a negative discrimination index were obtained over the period 2014-2018. This indicates that none of the items were defective. This is important to know since in many instances tutors refer to past paper items when designing new ones. As the material to be examined does not cover the whole Biology syllabus, tutors are limited to the type of items to set, especially the unstructured essay type. From Table 4, it is observed that over the five-year period of investigation, the discrimination index value ranged from 0.00 in Item 5 (2014) to 0.48 in Item 5 (2015). The percentage of items in each year was classified by the discrimination index and plotted against the description in Figure 2. This figure shows that in each year, except 2017, the highest percentage of items were classified as poor ($D < 0-0.19$). In fact, over the whole study period, 46% (16 items out of 35) had poor discrimination, 31% (11 items out of 35) had acceptable discrimination (D between 0.2-0.29), 20% (7 items out of 35) good discrimination (D between 0.3-0.39) and 3% excellent discrimination ($D > 0.4$). From Tables 4 and 5, it is observed that the majority of Paper 1 items (66%) fall within the ideal range (+0.3 and +1.0) showing that items were of good quality, but fewer (23%) in Paper 2.

Table 5. The discrimination index for each item in Paper 2, classified by year and item type. Values in bold type are greater than 0.3 (good discrimination and better).

Item number	Type of item	Discrimination Index				
		2014	2015	2016	2017	2018
1	Comprehension	0.37	0.32	0.36	0.28	0.32
2	Structured essay	0.25	0.20	0.18	0.16	0.26
3		0.07	0.15	0.15	0.24	0.12
4	Unstructured essay	0.32	0.10	0.10	0.20	0.34
5		0.00	0.48	0.27	0.21	0.11
6		0.19	0.05	0.21	0.21	0.33
7		0.23	0.15	0.06	0.05	0.01

Figure 2. Percentage of Paper 2 items classified by the description of the discrimination index for each year investigated.

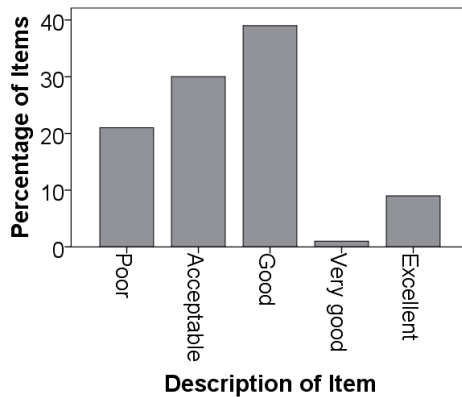


A discrimination index of zero was obtained only once in Paper 2 and never in Paper 1: the unstructured essay (Item 5 in 2014). This indicates that the item was either obtained correctly by everybody or incorrectly by everybody. In fact this was a difficult item chosen by 25% (79 out of 315) students and the mean score was 3.78 ± 3.039 (maximum: 25 marks). A discrimination index should be evaluated with reference to the difficulty level of the item, because a correlation method is used to assess the item's success in discriminating between low and high achieving students. If the items are very easy or difficult, indicating homogenous performance, there is less variation in the scores, thus resulting in a reduced potential for discrimination. Azzopardi & Azzopardi (2019) calculated the difficulty index values for Paper 2 items and results showed that Item 5 in 2014 was classified as too hard.

Figure 3 shows that, when combining both papers, 21% of the items had a poor discrimination, 30% acceptable discrimination and 39% had good discrimination. Results of this study are different from those reported by Khan et al., (2015) who investigated the discrimination index of essays, structured essays and short questions of 150 medical students. They reported 12.5% poor discrimination ($D < 0-0.19$), 75% of items with good discrimination (D between 0.3-0.39) and 12.5% acceptable (D between 0.2-0.29). The importance of item analysis is highlighted from this study. Clearly, an improvement of examination items with high discrimination should be implemented into future examinations to improve test scores and properly

discriminate among the students. A high discrimination index indicates a higher probability for students with a robust knowledge to answer the item correctly, while those with less knowledge will answer wrongly. The values of the discrimination index fall between -1 and 1. Ideally, an item should be able to distinguish the more able from the less able students, meaning that the high achievers get the item correct while the low achievers get it wrong. According to Anigbo (2015) the ideal discrimination index is between +0.3 and +1.0, but in this study only half of the items fall in this range.

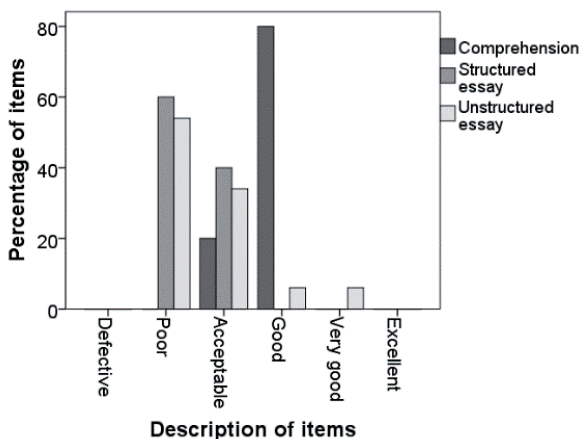
Figure 3. Percentage of Paper 1 and 2 items classified by the description of the discrimination index for all years investigated.



4.1 Research objective 3

To find out if the discrimination index of Paper 2 items (comprehension, structured essay and unstructured essay) differs. A one-way ANOVA between subjects was conducted to compare the discrimination index obtained in comprehensions, structured essays and unstructured essays. There was a significant difference in the discrimination index at the $p < 0.05$ level for the three types of question [$F(2, 32) = 4.568, p = 0.018$]. This difference is also illustrated in Figure 4 which shows a classification of the percentage of items according to the discrimination index for the items that appeared in Paper 2 in the five-year study. The figure shows that 80% of the comprehension items had good discrimination. However, a large percentage of items for structured essays (60%) and unstructured ones (54%), had poor discrimination. Thus it may be said that comprehension items are the best to discriminate between high and low achievers.

Figure 4. Percentage of comprehension, structured and unstructured essay type of item in Paper 2 classified by the description of the discrimination index for the five-year period investigated.



5. Conclusion and recommendation

The conclusion drawn is that Paper 1 is better at discriminating between high and low achievers than Paper 2. Structured essays and unstructured essays are not as good as comprehensions at discriminating such groups. This finding may be used to start a discussion at the institution to consider the validity of the essay-type of items in final Biology examinations. This is the first study ever to be conducted on Biology final examinations at the public institution concerned, regarding the discrimination index. Thus so far, test developers constructed novel items each year, especially for Paper 1, running the risk of reducing the reliability of the test by including, unknowingly, items with low discrimination. Constructing items for final examinations is time-consuming and requires careful selection of content that will produce the desired test results. Item analysis, that includes the discrimination index, provides valuable information for further item modification and future test development. Knowledge of the findings of this study opens a discussion at the institution to consider changing the method of setting up items. Since information is now available for items that appeared during the period 2014-2018, paper setters may choose past items having the ideal discrimination index. Extending the analysis of papers prior to 2014, amplifies the data base for future examinations.

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Bio-notes

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Concrete Heritage: Challenges in Conservation

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Abstract

The development of concrete in the 19th & 20th centuries led to new possibilities and advancement in construction. Concrete was exploited to address the post-war needs for economical and faster construction. Significant reinforced concrete structures are recognized as cultural heritage. Long term durability problems present conservation challenges and the understanding of failure mechanisms is fundamental for restoration. The diagnosis of historic structures, materials investigation, monitoring and assessment are important steps towards the understanding of deterioration and appraisal of concrete heritage. Long-term effects of conservation and repair also need to be considered. The assessment of concrete heritage is addressed through military and industrial heritage concrete structures in Malta, including coastal structures in aggressive environments. A methodology for appraisal is proposed taking into consideration materials and structural performance and degradation mechanisms.

Keywords: *degradation mechanisms, appraisal of concrete heritage structures, industrial heritage, military heritage.*

Introduction

The development of reinforced concrete towards the end of the 19th century and early 20th century led to significant advances in materials and structural systems. However, reinforced concrete structures started showing signs of degradation with time. Modern standards for reinforced concrete structures refer to the working life of structures and durability design with reference to exposure in different environments. There has been a growing awareness on concrete heritage structures over the past decades with a drive for their conservation. Yet, the conservation of heritage concrete structures presents major challenges. A fundamental step in the conservation of heritage structures in concrete is the appraisal of the materials and structure and the understanding of degradation mechanisms. The challenges and approach to conservation of concrete heritage is discussed with reference to unique industrial and military concrete structures in the Maltese Islands, including structures exposed to an aggressive marine environment.

Conservation of Concrete

Reinforced Concrete has developed as a predominant construction material in the 20th century and the appreciation of modern heritage structures draws attention to the conservation of concrete. There are significant challenges in reconciling the repair options and possibilities with the conservation needs of reinforced concrete structures. Cunstance Baker et al., 2015 note that methods and materials in industry may not take into account the conservation principles of minimal intervention and the retention of the original fabric, resulting in a significant impact on the appearance and materiality of the concrete (Cunstance Baker et al., 2015). The understanding of the behaviour of the materials in the historic concrete structure and the long term effects of conservation and repair are core issues in defining effective solutions to technical problems presented by deteriorating concrete.

Conservation

The ICOMOS Charter, Principles for the Analysis, Conservation and Structural Restoration of Architectural heritage (ICOMOS, 2003) refers to the value of architecture heritage which does not concern only the appearance but also the integrity of all components as a unique product of the specific building technology of its time (ICOMOS, 2003). For the development of a conservation strategy, the problems leading to the current state of a building need to be understood for each particular case, including historical information such as its use during its history in a particular environment. The investigation needs to identify the cause of the degradation mechanisms and any intervention needs to address this (MacDonald, 2001). An inadequate knowledge of the cause of degradation and the heritage significance of the building can lead to inadequate repair which can have a negative impact on the architectural, historical and cultural significance of the structure (MacDonald, 2003). There can be limitations to the assessment of materials and structures in the investigation of heritage buildings, promoting non-destructive assessment and reducing the extent of destructive testing of materials such as concrete coring. Fundamental principles in conservation including minimal intervention, maximum retention of original fabric and retreatability need to be revisited in the case of concrete. Unlike stone, concrete is monolithic and presents different challenges for conservation. The approach normally adopted in the conservation of stone structures therefore needs to be reconsidered when addressing the complexities of concrete structures.

Degradation of Concrete

Degradation of concrete and reinforced concrete depends on various factors including the constituent materials used in the production of concrete, the relative mix proportions, production process and construction methods, casting and curing, actions on the structure, structural design and detailing, environmental exposure, interventions over the years and maintenance of the structure during its life time. Degradation in concrete occurs as a result of chemical, physical and biological action (Mehta et al., 2006). The penetration of fluids through the microstructure of concrete leads to different degradation processes in the materials including concrete carbonation and chloride induced corrosion particularly in marine environments. Current design codes present durability design of reinforced concrete structures. EN206 presents the exposure classes to be adopted for structures exposed to different environmental conditions (EN 206). EN1990 refers to the design working life and durability of structures (EN1990). The Structural Eurocode 2 for the design of reinforced concrete structures includes requirements for durability design related to exposure classes, through detail design and cover to reinforcement (EN1992).

Repair and Conservation

Repair interventions are presented in EN1504 including surface treatment; patch repair relying on repair mortars and polymer based materials; injection including epoxy injection; electrochemical repair including re-alkalisation, desalination and chloride extraction; cathodic protection; external strengthening (Raupach et al., 2014). It is argued that a successful repair is very difficult to achieve (Vaysburd, 2006) and the premature failure of repair interventions can be attributed to incorrect diagnosis of the underlying problem, incorrect design of repair, poor workmanship, incorrect repair materials and failure to follow manufacturer specifications on the use of repair materials (Tilly et al., 2007).

The repair of structures is distinguished from conservation. In repair, the objective is to preserve structural and serviceability functions, replacing damaged concrete with mortar, concrete or sprayed concrete (shotcrete) to regain strength, density and durability as presented in EN1504 (EN1504, p.9, 2008). On the other hand, conservation refers to all measures and actions aimed at safeguarding tangible cultural heritage, while ensuring its accessibility to present and future generations. Conservation embraces preventive conservation, remedial conservation and restoration. All measures and actions should respect the significance and the physical properties of the cultural heritage item (ICOM, 2008).

There are different options for intervention on structures including: considering a degraded ruin without intervention; reassembled structure and anastylosis; reinstatement using contemporary materials; reconstruction adopting original

techniques; reconstruction using new materials; design of a new structure interpreting the historical structure. Different situations require a specific intervention, towards the conservation of reinforced concrete heritage.

Appraisal of Concrete Structures

The appraisal of concrete structures is an important step towards conservation. Any intervention strategy needs to be well informed in order to ensure that the right actions are undertaken to ensure the structural safety, material performance and longer term performance of the restoration interventions. The assessment is intended to provide sufficient information to prepare an intervention strategy for conservation. The appreciation of concrete and reinforced concrete structures requires a clear understanding of the purpose of the structure and its significance, the design, elements, materials and structural systems, actions on the structure and the environment.

The ACI 364.1R presents a guide for the evaluation of concrete structures prior to rehabilitation (ACI 364.1R, 1999). The structured methodology is based on: a preliminary investigation, detailed investigation including documentation, field inspection and condition survey, sampling and material testing; documentation with respect to design, materials, construction and service history. The evaluation is required to cover the structure and its components, geometry, materials, structure rehabilitation options and alternatives and cost. Concrete structures in service need to be inspected at intervals in order to determine their performance and possible degradation (ACI 201.1R, 2008). Furthermore, the inspection is supplemented with other investigations including non-destructive and destructive tests, especially when deterioration is observed.

The assessment of structures refers to key steps intended to compile sufficient documentation which enables the understanding of the behaviour of the structure and degradation mechanisms:

- Records and Documentation
- Classification and Mapping of Degradation
- Materials Assessment
- Structural Assessment
- Environmental Assessment

Records and Documentation

The records on the structure are compiled through archival research and also through an understanding of the use of the structure over time, its conditions and history. Such records include the architectural design, materials including

constituent of concrete and mix design, structural drawings and detailing of the structure, construction systems and any alterations and modifications at the time of construction or interventions including repair and maintenance during the service life of the structure.

Classification and Mapping of Degradation

The cataloguing and mapping of defects is necessary to present a clear picture of the state of all the parts of the structure and better relate defects to actions on the structure. Photogrammetric techniques, laser scanning and other advanced technologies are employed in documenting and recording the state of the structure at a particular time and in creating a 3D visual representation of the structure. Such techniques are also employed over time to monitor progression of degradation.

Assessment of Materials

The materials assessment is based on non-destructive test methods and testing on materials extracted from the structure itself.

Non-destructive techniques provide useful information on the state of the structure. The techniques adopted include sounding, Schmidt hammer assessment, cover meter survey, ground penetrating radar, ultrasonic techniques, resistivity, half-cell corrosion assessment, surface moisture and thermal camera.

The definition of the existing materials in the structure is an important first step and includes petrographic analysis and material characterisation through various techniques including Chemical analysis, X-Ray Fluorescence, X-Ray Diffraction, Fourier-Transform Infra-Red Spectroscopy, Electron Scanning Microscopy and Energy Dispersive Spectroscopy. In addition, X-Ray Tomography and Mercury Intrusion Porosimetry are also employed to define the microstructure, the pore structure and pore-size distribution of the material which also relate to its behaviour with respect to transport mechanisms and degradation processes.

Structural Assessment

The structural assessment is based on non-invasive assessment such as micro-tremor investigation and also structural assessment of the structure including finite element modelling. The micro-tremor ambient noise investigation using accelerometers can be compared to the results of the structural modelling, therefore defining the structural performance. The structural modelling enables the assessment of different load combinations and actions on the structure and its elements, and the

assessment of the original structure, the degraded one and also repair scenarios. This is a useful tool in assessing performance not only of the structure in the degraded state but also considering repair options.

Environmental Assessment

The assessment of actions on the structure is of importance since structures exposed to different environmental conditions manifest different durability performance. Structures in coastal areas are exposed to air-borne salts whilst coastal structures including harbour infrastructure are exposed directly to saltwater, among other actions. The location and orientation of structures need to be considered as a result of the effects of ground conditions including sources of contamination, the influence of solar radiation, prevailing winds and other actions on durability performance.

Industrial and Military Heritage Structures in Malta

The assessment of degradation of concrete and reinforced concrete structures is presented with reference to key representative structures in the Maltese Islands where the methodological approach defined above has been employed to first understand the state of the structures and then present a strategic framework for intervention in line with the conservation of concrete and reinforced concrete structures. The structures have been classified into two groups: Industrial Heritage and Military Structures, even though there is a clear overlap in various cases.

Industrial Heritage

Concrete and reinforced concrete were extensively used in industrial structures in Malta in the early 20th century. Reinforced concrete could provide for larger spans and slender columns to address the need for open spaces in industrial buildings. It was also exploited in infrastructure works including water retaining structures and reservoirs as a result of its versatility. These applications may also result in increased exposure of the concrete and reinforced concrete to aggressive environments.

Water Tower at the Civil Abattoir in Marsa

The Water Tower at the Marsa Public Abattoir was constructed in the 1930s to serve the needs of the abattoir. It is the only structure of its type and size in the Maltese Islands and is considered as an important industrial heritage monument.

The structure had been considered for demolition as a result not only of its severe degradation but also because of the development of alternative means of storing water in reservoirs and supplying water within the abattoir facilities (MRRA, 2011). The case for the conservation of the unique water tower was made in 2010 and presented through a technical report to the Ministry for Resources and Rural Affairs in 2011 (Borg, 2011). Its conservation and restoration were entrusted to the University of Malta, following an agreement for collaboration between the Ministry for Sustainable Development the Environment and Climate Change, the Lands Authority and the University of Malta in October 2016. Its restoration was approved by the Planning Authority in 2017, following a full development permission for its restoration and strengthening based on innovative techniques which address the particular needs of the structure (Borg, 2017).

The Water Tower consists of a large reinforced concrete structure, c.14.5 m high with a tank having an internal diameter of c.9.5m. The tank consists of a shell structure with a cylindrical drum resting on a truncated conical structure with a dome at the base and with ring beams at the top and between each element. The tank rests on a ring beam supported on 12 slender reinforced concrete columns with a reinforced concrete foundation ring at the base. The structure has been repaired in the 1970s and the repair intervention included the strengthening of the 12 columns using a reinforced concrete jacket.

There is evidence that it used to be filled in with brackish and sea water. The age of the structure including the use of sea water in the tank, its location close to the sea in the industrial area of the Grand Harbour and other aspects have contributed to its degradation. This is primarily due to the corrosion of its reinforcement, extensive on the south facing side of the tank. Carbonation of concrete and chloride ion penetration through the concrete structure resulted in the corrosion of reinforcement, cracking, spalling and delamination with loss of concrete section and loss of reinforcement. The combined effects of corrosion-related processes, wet and dry cycles and stresses in the structure in operation, all contributed to degradation.



Figure 1a. Reinforced Concrete Water Tower, Public Abattoir, Marsa, Malta.



Figure 1b. The upper part of the structure consisting of a reinforced concrete tank.



Figure 1c. Aerial view of the water tower.



Figure 2a. Degradation on the south face of the tank, corrosion of reinforcement, spalling and delamination of concrete.



Figure 2b. The interior of the tank.

Water Tower at the Gżira Pumping Station

A master plan for the creation of domestic fresh water and sewer infrastructure for the Grand Harbour area, its suburbs and the North Harbour area was prepared by British Civil Engineer Osbert Chadwick in the late 19th century. The Gżira Pumping Station consists of a Neo-Gothic building designed by Prof. Giorgio C. Schinas and served as the Water and Sewer Pumping Station for the North Harbour area. Together with Royal Engineer Captain T.J. Tressider, Schinas constructed the fresh water and sewer infrastructure for the North Harbour Area. The water and sewer pumping station is a Grade 1 national monument.

The reinforced concrete water tower within the precincts of the pumping station was probably constructed in the second half of the 20th century. The structure continued to be used until the late 20th century and early 21st century. The water tower

is c.6m high and the cylindrical drum tank is c.2m high with an external diameter of c.3m, resting on a ring beam supported by four, c.3.5m high inclined reinforced concrete columns. The main cause of degradation is concrete carbonation resulting in loss of passivation, corrosion of reinforcement and spalling and delamination of the concrete. As a result of the degradation of the four reinforced concrete columns, an additional four columns were constructed as temporary supports using concrete blockwork. The structure is one of the few examples of reinforced concrete water towers in Malta.



Figure 3a. Water Tower at the Gzira Pumping Station, Malta.



Figure 3b. Water Tank.



Figure 3c. Degradation in the water tank and ring beam including cracking and spalling as a result of the corrosion of the reinforcement.

Bridge at the Mġarr ix-Xini Pumping Station, Gozo

Engineer Osbert Chadwick had been requested to conduct an inspection of the supply of water in Gozo in the late 1880s by Lieutenant Governor Hely-Hutchinson. At the time, the supply of water relied on natural springs. Due to a sudden shortage of water, in January 1888 an immediate project was assigned to G.C. Schinas to pump water from the Ġhajnsielem springs to Victoria and other villages in Gozo. In 1897, Chadwick re-proposed the Mġarr ix-Xini water pumping station as the Ġhajnsielem springs were running low. The Mġarr ix-Xini freshwater pumping station located in the valley was constructed in the 1890s under the Colonial Government for the pumping of mean-sea level ground water and included the excavation of a system of galleries 4,600 feet long. It served as the main source of drinking water in Gozo in the late 19th, early 20th century with the extraction of 190,000 gallons of water per day.

Two pipelines were constructed to supply water from the pumping station to a reservoir in Ta' Ċenċ and another one to Nadur. The pipeline transporting water to Nadur was supported by a bridge across the valley. This bridge still stands today within the valley basin in front of the pumping station, intended to support a cast iron pipe from the pumping station across to the other side of the valley into a tunnel and a trench up to the reservoir in the village of Nadur. The bridge consists of three arches supported on columns resting on the valley bed. A new pumping station was constructed in Xewkija in the 1960s and the galleries were deepened for water to be redirected to the Xewkija pumping station. The Mġarr ix-Xini station was abandoned and is in a state of disrepair (Galea, 2016). In general, the bridge is overgrown with vegetation and the pipework and its supports are damaged, but the structure itself does not show major signs of degradation.



Figure 4a. The Mġarr ix-Xini pumping Station.



Figure 4b. The three arched concrete bridge intended to support the water pipeline, crossing the valley.

Military Heritage

Fort Ricasoli Gun Emplacements and Fire Control Towers

Fort Ricasoli was built at the entrance of the Grand Harbour in 1670, based on a design by Engineer Antonio Amurizio Valperga. The fort was strengthened further during the 18th century and during the last years of the Order's rule on the island. The British noted the forts' important location and armed it strongly with various interventions. In the years prior to the Second World War, Fort Ricasoli was re-armed with three twin 6-pdr QF guns in metal turrets. The emplacements were located on the Ricasoli Fort Bastions no. 2, 3 and 4. Each emplacement had a high concrete fire control tower at the back. In addition, the rear of the gun turrets was protected by a concrete apron. It consisted of a circular covered passageway with columns along

the gun emplacement and a reinforced concrete wall at the back to provide gun-crew with overhead protection. An underground magazine was located beneath the emplacement. The construction of the twin 6-pdr QF gun emplacements with their characteristic high fire control towers on the bastions were the final phase of the fortification of Fort Ricasoli in the 1930s, prior to World War II (Spiteri, 1996).

The structures are immediately on the sea, exposed to air borne salts and to an aggressive XS marine environment. (EN206). The structure experiences extensive reinforcement corrosion, concrete spalling and delamination resulting in the extensive loss of sections. Since the structures include large concrete sections typical of a number of military heritage defence structures, they are still in a relatively stable condition though suffering severe degradation.



Figure 5a. The Bastion No.4, twin 6-pdr QF gun emplacement with the characteristic high fire control tower at Fort Ricasoli.



Figure 5b. The passageway and overhead protection at the back of the twin 6-pdr QF gun emplacement at Fort Ricasoli, with severe degradation.

The Acoustic Mirror, Magħtab

Passive early warning systems were developed towards the end of the 1920s and early 1930s, in the form of large reinforced concrete structures intended to pick up the noise of an approaching aircraft from a considerable distance away. The sound received by the large dish-shaped structure was amplified and focused by a probe placed at the centre of the structure, to a central listening position. The acoustic mirror equipped with different sound detectors could listen to and get a bearing of the detected sound, enabling the calculation of the position of its direction (Abela, 2014). A major setback was the fact that the mirrors picked up all sounds. Acoustic mirrors still stand at Denge on the Dungeness peninsula and at Hythe in Kent and other parts of Britain. Acoustic mirrors were also planned to help protect key colonies, namely Gibraltar, Malta and Singapore. Surveys were undertaken in Malta in 1933 and five suitable sites were identified around the coast. The ideal site had to be sheltered from noise from behind and from the sides as well as from the breaking waves of the sea. Five sites were

proposed in Malta but one mirror was constructed, in Magħtab, approximately a mile inland with cliffs behind facing out to sea towards Sicily at a bearing of 20 degrees. It was constructed in autumn 1934 and works were completed during the summer of 1935. The electrical equipment was installed in September 1935. The cost of the mirror reached c.4500 Pounds. The Magħtab Acoustic Mirror (Widna) is a copy of the Denge acoustic mirror with minor differences such as small projecting buttresses at the foot of the face of the mirror, reported to detract from its performance. The parabolic concrete surface is a strip from a sphere with a 150 feet radius and measures 200 feet horizontally and 27 feet in height. A 55 feet concrete platform slopes down to a listening trench picking sound from 18 microphones. Trials established that the mirror had a range of 21 to 37 miles, with an average of 25 miles and a bearing error of +/- 2.5 degrees, providing a 6 minute warning of an enemy aircraft approaching Malta at 25mph. The Magħtab mirror was reported to be out of use by 5th May 1937, as a result of the development of RADAR as an active early warning system.

The Acoustic Mirror in Magħtab is protected by the Planning Authority as a Grade 2 Scheduled property. The structure consists of the large parabolic concrete wall with buttresses at the back, small buttresses at its base on the front side and a large sloping platform in front leading to a trench.

The structure still retains its distinctive red, white and green paint pattern on the surface and is in general in a good state of repair. Though not located immediately on the sea, the structure is mainly exposed to airborne salts and moisture from the ground. A catalogue of defects was compiled for the structure and degradation mapping was undertaken for the entire structure. This exercise was followed by non-destructive assessment of the structure based on sounding, Schmidt hammer, ultrasonic pulse velocity, surface moisture and cover meter investigation. The main degradation was mapped for the entire structure. Spalling of the concrete was mapped in specific areas on the front wall, together with spalling and delamination in the lower parts of the reinforced concrete buttresses at the back. The degradation is associated with concrete carbonation resulting in loss of passivation and corrosion of reinforcement, higher moisture content in the lower sections, in particular along the buttresses on the south face.



Figure 6a. The Magħtab Acoustic Mirror buttressed structure from the back.



Figure 6b. The Magħtab Acoustic Mirror structure front view.



Figure 7a. The Maghtab Acoustic Mirror buttressed structure from the back (2017).



Figure 7b. The Maghtab Acoustic Mirror structure front view (2017).

Pillboxes and Beach-posts

The threat of invasion caused by the Abyssinian crisis in 1935 led to the construction of a number of pillboxes for the purpose of defence in Malta. Improvised pillboxes were first built, but a network of pillbox defence structures was laid down in the following years in a report on the Malta Defences by the Joint Overseas and Home Defence Committee (JDC No. 280), where point No. 15 in the list of priorities laid down in 1936 emphasized the construction of infantry posts on beaches, together with the emplacement of 12-pdrs for beach defence. The report recommended that sector posts and CWP Concealed weapons posts were to be constructed at all likely landing places to act as a deterrent in spite of the enemy knowing of their existence. The real concentrated scheme for pillboxes building began in August 1938, and proceeded incrementally in stages nearly up to 1942 (Spiteri, 1996).

Early pillboxes were constructed in north Malta which was exposed due to the landing bays and lack of fortifications and coastal defences. The first group of pillboxes were stone-clad pillboxes constructed from 1935 onwards in Northern Malta, intended to strengthen the defences of the areas in preparation for an Italian invasion. The field defences and stone-clad pillboxes were concentrated around the major bays in the North. 1938 marks the beginning of the programme of pill-box construction in Malta. Fort Campbell at Selmun, built in the period 1937-1938, was equipped with concrete machine gun posts along its perimeter wall. Features in the pillboxes included mounting of the defence armament involving semi-circular concrete tables and gun-crew benches. The structures were camouflaged using rubble stone cladding. By 1939, defence lines of pillboxes were established and around 80 beach posts, defence posts, reserve posts and gun posts were reported in early 1940. This number increased considerably in the following years up to 1942, covering most of the Island.

The first pillboxes constructed can be distinguished from their elaborate camouflage using rubble stone cladding to the concrete structure, blending in with the surrounding rubble walls and rural structures. This represents also a continuation of the practice of erecting rubble wall parapets in trenchlike field defences in earlier years. From late 1939 onwards, the time-consuming rubble clad camouflage construction was discontinued and paint work on the concrete was applied instead. The stone cladding, plan adaptation to site requirements and curved fronts and rounded edges were abandoned in favour of pillboxes built in more geometric and standard structures. This reflected a greater sense of urgency, manifesting itself in rapid construction because of the growing threat of war and invasion. By 1939, the second group of pillboxes appeared as reinforced concrete structures, polygonal or rectangular in plan with a bare concrete finish. These box-like structures were more difficult to conceal in a predominantly flat land and were therefore disguised as rural structures and farmhouses with camouflage in the form of paint work including doors and windows on the concrete surface.

Pillboxes mainly consisted of reinforced concrete. Their design varied but nearly all had a rectangular observation cupola with all round vision slits or with a distinct turret on the side (Wied Dalam Pillbox). The supply of cement was limited so minimum sufficient thickness of walls and roofs were imposed for the maximum amount of pillboxes possible. Typically, the concrete is 15 inches thick. Curved corners were desirable because of ballistic standards but were rarely constructed due to the pressing conditions. The concrete was reinforced with 3/8" reinforcement at approximately 3" spacing horizontally and vertically.

All pillboxes show significant signs of degradation though inland structures are in a better state than structures on the coast. Beach posts exposed to an aggressive marine environment show severe degradation, corrosion of reinforcement, spalling and delamination, and frequently loss of section. Some of the structures are observed to include sea-shells and pebble aggregate probably sourced from the nearby beach contaminated with sea water and a low quantity of cement, probably due to the pressing needs of construction over short timeframes with limited resources available. Some of the structures built in the later years during the war were also built under pressing conditions and manifest even greater degradation than structures built earlier in the 1930s. The state of the structures and the inherent defects in the materials and structure, present significant challenges for the conservation of these structures today.



Figure 8a. Wied Dalam PillBox.



Figure 8b. Xghajra PillBox.



Figure 9a. Mistra PillBox.



Figure 9b. Rinella Reinforced concrete post.

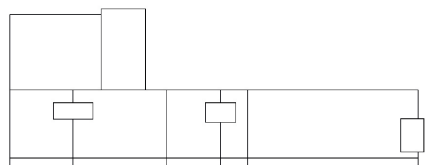
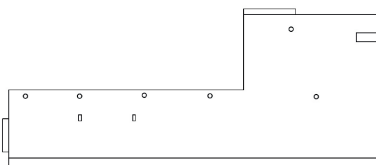
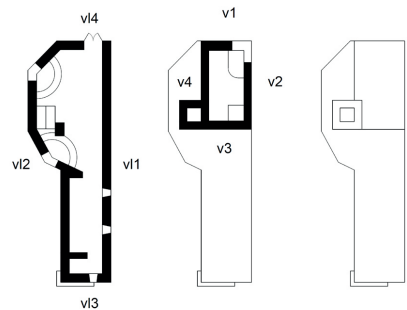


Figure 10. Prajjet, Mellieha Beach Post, degradation of concrete, plans and elevations of the structure.

Conclusion

Concrete repair is important in the rehabilitation of contemporary concrete but it does not automatically satisfy conservation principles which are crucial to the safeguarding of historic concrete and reinforced concrete structures. Structural performance and serviceability criteria need to be addressed if a building is to perform its functions and the durability of the repair intervention itself is of importance.

It is acknowledged that the emerging field of conservation of concrete and reinforced concrete structures presents new challenges to the scientific community and there is limited experience in conservation case studies and long-term performance of interventions; no fixed rules can be broadly applied. A successful conservation intervention requires sensitivity to the materials and structure and the need to address specific peculiarities and characteristics of each structure and component. Different structures present different challenges and an interdisciplinary approach with a sound knowledge in materials and structural behaviour is necessary to address the conservation of reinforced concrete heritage.

The Venice Charter states that the conservation and restoration of monuments must have recourse to all the sciences and techniques which can contribute to the study and safeguarding of the architectural heritage (The Venice Charter, 1964). A structured methodology needs to respect the following: principles of conservation; documentation and historic research; scientific and engineering methods; inspection and materials and structural appraisal; material assessment; non-destructive assessment and non-invasive techniques; structural modelling and analysis; definition of restoration intervention options and assessment of the merits and limitations of each intervention; intervention proposal framework assessment; appraisal of the restored structure; long term monitoring of materials and structures.

In the conservation of heritage structures in concrete, the understanding of the structure and the degradation mechanisms in its particular environment are fundamental. The conservation of concrete heritage presents major challenges and an effective approach for intervention requires a structured methodology for the appraisal of materials and structure leading to a thorough understanding of the historic concrete structure. In this context, each structure and part thereof, presents specific needs which require appropriate tailor-made well-designed interventions. This approach requires a sound understanding of materials and degradation mechanisms, technological solutions for intervention and an assessment of the long-term effects of the interventions towards conservation.

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Bio-note

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A Call for Parental Involvement in State Schools

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Abstract

Parental involvement (PI) in the education of children is an important element of effective education (Horby, 2017). The setting of School Councils regulated by LEGAL NOTICE 135/1993 is one way to encourage PI in State Schools in Malta. However, the role of School Councils is fluid and participation is not promising. This paper provides an overview of the current PI based on Hornby's (2000) models from the perspective of the author's experience originating from her involvement with School Councils since 2008 and her role as president of the Maltese Association of Parents of State School students (MAPSSS) since 2012. The call for parental involvement comes from policy makers and the parents themselves, but, in practice, there are various gaps and barriers that hinder parental participation in the schooling of their children. The changes in the social dynamics challenge the traditional role of parental involvement schools which teachers are bound to. The teachers' and parents' understanding of parental involvement may not be congruent, creating a sense of suspicion that conditions the possibility for collaboration. Moreover, the changing context of the education system and the demands on teachers sidelines further parental involvement. To translate the call for parental involvement in practice, the necessary support through training and guidance to all parties and the required structure should be embedded in the system, so as to allow a gradual paradigm shift.

Keywords: *Parental involvement, School Councils, State Schools, MAPSSS.*

Introduction

Extensive research indicates that Parental Involvement¹ (PI) is an important element in formal education and it is advantageous for all children of any age-group (Epstein, 2001; Cox, 2005; Hornby, 2011). Apart from facilitating academic achievements, PI improves the students' attitude, behaviour, mental health and attendance. This in turn contributes to an overall improved school climate and teacher morale (Hornby & Blackwell, 2018). PI may vary from supervision of homework to attending parent-teacher meetings or education workshops. Hornby (2000) created a framework

1 Parental Involvement refers also to students/children's legal guardians and caregivers

that elaborates hierarchies of PI varying from communication, liaison, education, support, information, collaboration, resource and policy.

International research over the past decades reinforces the importance of PI to support an effective education (Epstein, 2001; Cox, 2005; Hornby, 2011). However, this contrasts with the reality in schools, where worldwide PI is marginal (Epstein, 1990). This article is an appraisal of PI in State Schools within the Maltese context. The reflections in this article are based primarily on my involvement in the Maltese Association of Parents of State School Students - MAPSSS² since 2012 both as a founding member and as president. It also draws from my experience as a ministerial appointee as president of School Councils since 2008. My insight on parental involvement, particularly in State Schools (which is the largest sector in Malta) comes from two vantage points both as an educator involved in teachers' training and as a parent of children attending both primary and secondary schools. This article employs, as its primary methodology, participant observation that also draws from participation in various conferences, from focus group discussions organised by various entities and from working groups and committees set by the Ministry for Education and Employment (MEDE).

The Call for Parental Involvement

The call for parental involvement in State Schools in Malta has been supported by a legal framework since 1993 through the Subsidiary Legislation 327.43, entitled School Council Regulations, which was amended in 2007 by Legal Notice 424. All State Schools are administered by a School Council composed of the President, who is appointed by the Minister, the Head of School in the role of the Secretary/Treasurer, 3 educators and 3 parents. Elections are held every 2 years to appoint educators among the school staff and parents among those of the students attending that particular school. The most recent elections were held in January 2019, showing an overall increase in parents' participation compared to the 2017 elections but which still marking a low turnout in nominees among parents, given that the elections were only held in 28 schools (MEDE, 2019).

The legal notice provides guidelines on the operation of the Council, including the role of the President, the Secretary/Treasurer and the Council activity, which is divided into sections: Administration of Funds and Assets, Contact with Parents, The Council and Local Organization, The Council and the School Staff, The Council and the Running of the School, The Council and the School Environment. Although the document includes operation guidelines that state what the Council may or may not do in specific circumstances, it does not state the responsibility of the Council

² <http://mapsss.org/>

in principle.³ This creates ambiguity as the Council's remit is not clear, particularly when it comes to aspects related to the curriculum and to the drawing of policies. Yet, since the section regarding the Administration of Funds and Assets and the School Environment are straightforward, the role of the School Council has been minimised to fundraising activities and maintenance assistance with the help of parents in many schools. This follows the general roles taken by parents in education as helpers and fundraisers even in other countries (Hornby, 2000). Unfortunately, a number of parents perceive that the role of parents in School Councils is limited to fund-raising activities. Some parents would like to contribute more on the educational aspect rather than fund raising activities and hence end up shying away from School Councils, missing the possibility to contribute more as governors. The legal framework for School Councils is there to support the idea of parents as governors of the school, but the reality may be different. This is where the praxis regarding parental involvement in education in state schools lies.

Beyond the legal framework regulating School Council, there are various initiatives that encourage parental involvement within the education system. This includes the recent organisation of accredited modules for parents and guardians by the Institute of Education (MEDE). The Faculty of Education at the University of Malta addresses parental involvement with prospective teachers through seminars and tutorials. During 2018-2019 alone, there were a number of conferences, seminars and workshops that addressed, directly or indirectly, parental involvement in our education system. These include a workshop to Ensure Quality Early Childhood Education organised jointly by the Faculty of Social Wellbeing and the Faculty of Education, a seminar entitled The Child in Early Childhood Education organised by Lisa Marie Foundation, a seminar to discuss Guidelines on Social Media organised by the Directorate for Education Services (MEDE) and a seminar regarding the international tests PIRLS, PISA and TIMSS organised by the Malta Union of Teachers (MUT). Moreover, parents are represented even in the National Curriculum Framework Board, the Council for the Teaching Profession and the Foundation for Tomorrow Schools. MAPSSS committee members have been invited to attend various workshop and consultation meetings, varying from the introduction of the tablet in primary schools, discussions regarding the school transport system and early school leaving and changes to the Benchmark Examinations. The call for parental involvement in the education system is consistent, yet the remarks on social media and the actual figures of parents participating in School Council elections suggest otherwise.

Various questions arise from this scenario: what is conditioning parental involvement in schools? Is this a matter of logistics due to work commitments, of power-relationships with the teachers, or disinterest in their own children's education, as it is sometimes interpreted by educators? There is no one simple answer to such complex situations and interpretations.

3 Changes to the legal framework regarding School Council may be included in the imminent publication of the upcoming Education Act.

Parental Involvement in Formal Education – A Rhetoric of the Call

Hornby (2000) identifies 6 models of PI in schools, as summarised in Table 1, which have different sets of assumptions, goals and strategies that either try to minimise parental involvement or promote it actively:

Models For Parental Involvement	
Protection Model	PI is limited to taking the children to school on time and providing them with the necessary resources. PI is considered unnecessary and potentially damaging to an efficient education
Expert Model	Teachers are considered the experts in the development and education of children whereas parents are there to receive information and instructions about their children. Parents end up submissive to teachers who overlook information that may be provided by parents
Transmission Model	Teachers consider themselves as the experts with children but recognise that parents can be a useful resource to whom they can transmit their expertise to follow up their intervention with the children. The teacher is in control and decides on the intervention, yet it is more likely that the parents' concerns are addressed.
Curriculum Enrichment Model	Parents are considered important experts who collaborate with teachers to implement the curriculum as they learn from each other.
Consumer Model	Teachers are considered consultants by providing information and range of options for the parents to consider and who decide the course of action
Partnership Model	Teachers are considered experts on education whereas parents are considered experts on the children. The relationship between teachers and parents is considered a partnership based on mutual respect which involves sharing of expertise and control

Table 1: Models for Parental Involvement adapted from Hornby (2000)

Generally, during a scholastic year calendar, parents of children attending primary State Schools in Malta are usually invited to school on very few occasions. In the beginning of the scholastic year they hear about the school policy and meet the teachers. Towards the end of the first term they have a short meeting with the teacher of about 5 minutes during Parents' Evening. In December they are invited to the Christmas concert and maybe to some open-class activities. Parents' days are organised in the second term where parents have a 10-minute briefing about the child's progress with the teacher. The School's Senior Management Teams (SMT) are usually also present, to discuss any issues raised by parents. Parents may also be invited to school for information meetings held by PSCD (Personal Social Career Development) teachers or Education Officers of specific subjects to discuss specific

themes such as the use of the Digital Tablet, how to study Maths or how to improve the literacy of the child. Occasionally, schools organise other talks for parents on themes like cyber bullying or drug abuse. Throughout the scholastic year, teachers communicate with parents through a notebook, and if the need arises, both the parents and teachers may fix an appointment to meet.

In the secondary cycle of education, parents are invited for a Parents' Evening in the first term and a Parents' Day in the second term, where parents queue up to talk to the subject teachers. Communication with the SMT or the teachers during the rest of the year is either through notes, emails or phone calls to the central office at school or by setting an appointment with the people concerned. The school may update parents through emails/circulars. Some primary and secondary schools use social media to circulate notices or share photos of the schools' activities. In case of a major reform in the system, such as the introduction of continuous assessments or vocational and applied subject through the My Journey programme, meetings for parents are College based organised by the Directorate for Curriculum, Lifelong Learning and Employability (MEDE).

Moreover, the level of parents' participation in schools and the role parents take in School Council is very fluid. In most schools, parents (mainly mothers) help in the fundraising activities. Occasionally, Council parent members embark in projects, such as helping out and upgrading the school library. The direction and focus of the School Council is generally given by the Head of School or the President of the School Council. Occasionally, although not specified in the legal notice, Heads of school invite Council parents' representatives to participate in the School Development Plan.

The majority of PI in State Schools follow the Expert Model and the Transmission Model, even if the Partnership Model is being promoted. The importance of parental involvement in the education system of the Maltese Islands has been stressed and encouraged in various occasions and in different fora. As stated by Minister Bartolo (2014), parental involvement should not be limited to sending information to parents but through actual family engagement through discussion. The setting of an association for parents of state school students (MAPSSS) was encouraged by both the former government administration in 2012 and supported by the current Ministry for Education and Employment since 2013, as policy makers could feel that parental involvement is lacking within the Maltese education system. MAPSSS as an association tries to fill the lacuna of PI on a policy level. Since its establishment MAPSSS Committee has regular meetings and communication with senior officials at the Ministry for Education and Employment regarding policies varying from the curriculum, to daily matters. MAPSSS seeks to maintain an open dialogue with MUT (Malta Union of Teachers) and UPE (Union of Professional Educators) as teachers' representatives.

The rhetoric of parental involvement may be attributed to various factors. Hornby (2000) identifies various factors that determine the extent of PI in schools that may

also be identified within the Maltese context. One of the barriers to PI is what Hornby (2000) refers to as 'demographic changes' but which are strictly speaking 'social changes', considering that this is related to the increasing involvement of mothers in the work force and single mother households that results in a decreased involvement in school matters (Hornby & R. Lafaele, 2011). However, the decrease in the involvement in school matters as a result of the 'demographic-social' shift cannot be equated simply to a decrease in the parents' interest in the education of their children, as it is sometimes implied by educators. Rather, this is attributed to the change in the lifestyle of the household, which does not fit the traditional model of how parents are involved in school matters. For example, legal notice 327.43 of 2007 regarding School Council states that this should meet at least once a month, but meetings are generally held in the morning, which clashes with parents' work commitments. The custom to hold the meetings during school hours is deterring the participation of parents who do not have flexible working hours in School Councils. When both parents work, there will be less time available for both home-based and school-based PI, even to follow the children with their homework (Catsambis, 2001; Green et al., 2007). This situation is incongruent with the teacher's expectations from parents and undermines the idea of parents as partners in the education of students. It reinforces further some of the teachers' deficit model of parents who, as stated by Hornby (2000), are often considered 'problematic', 'vulnerable' and 'less able'. Bastiani (1993) comments that a partnership is at odds when there is no mutual respect, negotiations and shared purposes. Parent-school partnership is often determined by the school's agenda of how parents should engage with the school. Bastiani (1993) and Rudny (2005) point out that the objectives of parents and teachers regarding PI may be different; teachers tend to focus on the academic dimension whereas parents consider also the child's sense of belonging and progress with the rest of the children amongst others. One cannot ignore that parents' approach to the schools is often conditioned by their own school experience. It cannot be dismissed that some parents decide to check their conversation with teachers and SMT, as they are conditioned by the power-relationship in this 'partnership' with schools since teachers have their children in their care. On the other hand, the teachers' experience with parents determine their attitude to PI. Violent incidents, as the one which occurred in February 2019 in a secondary school, where 2 adults, a parent and an uncle, hurt a student and an educator, definitely contribute to a sense of suspicion and cautionary attitude from behalf of the school staff. MAPSSS as an association does not discuss these specific incidents, but tries to strengthen the home school link by providing feedback to policy makers in the attempt to create fora for better communication between schools and homes.

Unfortunately, there is a tendency among many teachers to generalise about parents, as if a bad experience with one parent that may have not respected their boundaries with educators is reflecting the attitude of all the parents. As Bastiani (1993) points out, parents speak with different voices and are certainly

not a homogeneous group. On the other hand, even the perception of the parents towards teachers may be conditioned by their past school experience. Difference in perceptions and assumptions of parents and teachers widen the gap between the rhetoric and the reality of PI. However, Hornby (2000) explains that the experience of parents depends also on the school culture. Schools that are welcoming to parents develop a more effective PI. Epstein (2001) states that parents are more involved when they perceive that they are welcomed by teachers who have a positive and facilitating attitude. The attitude of parents and teachers weave their approach towards PI and determine the atmosphere and actions regarding PI. Christenson and Sheridan (2001) suggested that approach, attitude, atmosphere and action are four key elements for enhancing PI. However, in my role as an educator and as a parent involved in MAPSSS, I observed that the prevailing sentiment among both teachers and parents towards each other is a sense of 'suspicion'. This is attributed to various factors, including the teachers' working environment that encompasses several reforms in the education system at large. These put further demands on educators, apart from increasing a sense of accountability for the students' achievements. On the other hand, one cannot ignore that, as explained by Hornby and R. Lafaele (2011), as a result of the neo liberal market driven economy, parents' attitudes changed to recognise their rights for PI. This context highlights that PI in education is a complex matter that goes beyond simplistic notions and the issues that arise are related to how to implement effective PI in a context where generalisations and 'othering' prevail.

Conclusion

I have come to believe that a key factor that contributes for a collaborative working relationship between teachers and parents as a means of providing quality education to students is the development of interpersonal skills that might facilitate communication leading to an eventual ironing out of perceptions and misinformation that hinder a positive approach, attitude and atmosphere to enhance effective PI. The onus remains mainly on the teacher as the professional. However, notwithstanding the cry for PI, the future of effective parental participation in the education of their children is not promising. The complexity of the context is acknowledged. The way forward is frail. Teachers' training programmes side-line parental involvement. This is not different from other countries (Epstein, 1985) and it reflects the professional expectations from parents as key stakeholders in an education system. Moreover, as Hornby (2000) explains, effective PI involve increasing teachers' time. This may not be easily available for teachers as a result of the ongoing reforms and the associated reform fatigue teachers lament about due to their ongoing struggle with time management. Furthermore, effective PI would require additional financial and human resources (Hornby, 2000) that may not be easily attained due to the shortage

of teachers of certain subjects rather than others. This context does not promise any shift in approach to PI. In view of this scenario, expecting teachers to add on effective schemes of parental involvement to their professional commitment without the necessary support and structures may actually backfire, to the detriment of the education experience of generations of students.

In order to translate the call for parental involvement from policy to practice, there needs to be a gradual paradigm shift in the general approach towards parents as valued contributors to the education of the younger generation. The call for parental involvement should be supported by training and guidance to all parties and by providing various possibilities that would allow space for teachers and parents to meet and talk to clear away the air of suspicion. The efforts and creativity of a number of teachers who try to engage meaningfully with parents notwithstanding the circumstances they operate in may be the kindle that warms the atmosphere for more effective parental involvement in schools.

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Bio-note

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The Oedipus and Electra Complex in Italian Literature of the Late 19th Century

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Abstract

As Ellen Key outlined in 1900, the 20th century centred on the child and literary theory started analysing texts from a Freudian and Jungian perspective. Italian narrative texts from various authors of the late 19th century assert the Oedipus complex theory where the child's obsession with the mother deems the father a rival insofar as he exemplifies castration. Authors such as Luigi Capuana, Edmondo De Amicis and Carlo Dossi express this fear of losing the mother in autobiographical works which denote their seduction by the preferred parent. Certain literary characters such as Pinocchio or Rosso Malpelo lack this sense of security the mother provides; hence, they survive by substituting the biological mother with the fairy godmother or, as in Malpelo's case, by exalting the father figure with whom he identifies.

The Electra complex, the girl's psychosexual competition with her mother for possession of the father, is prominent in Sibilla Aleramo's confession of her childhood obsession for the father. This psychoanalytical approach developed later in the 20th century because, as Luce Irigaray states, the daughter has always occupied a marginal role in society. Sometimes the mother manifests ambiguous behaviour (*Gli spostati* and *Tortura*) given that she no longer feels obliged by nature to love her offspring. As a popular saying goes, "the hand that rocks the cradle rules the world" and these literary works epitomise the sheer significance of the parent-figure with respect to the child's psychological and social well-being.

Keywords: *psychoanalysis, Oedipus Complex, Electra Complex, Italian literature.*

As Ellen Key states in her book *The Century of the Child* (1900), the 20th century was to mark an important landmark in that it gradually moved away from the centrality of the female figure, typical of the previous century, and focused more intensely on childhood. In such a context, the child became the fulcrum of psychoanalytical, sociological and literary studies. With Sigmund Freud's revolutionary theory of the Oedipus complex followed by Karl Jung's interpretation of the Electra complex¹, literary theory acquired a new perspective as scholars pondered on the child's

1 Freud himself explicitly rejected Jung's term because it "seeks to emphasize the analogy between the attitude of the two sexes", preferring the use of *feminine Oedipus attitude* or *negative Oedipus complex* in his own writings.

obsession for the preferred parent. Examples of this phenomenon can also be encountered in Italian narrative literature of the late 19th century and the first few years of the 20th century.

It seems strange to associate desire or sex with childhood but Freud insists that sex starts with life and not in puberty because the genital organs are already present in the early stages of life. Psychoanalysts see the mother as a symbol of love whereas the father represents castration and tends to ruin the intimate relationship between mother and son. The child's obsession to possess the mother is a process which instils feelings of guilt but triggers the instinct to seek pleasure. As Donald Winnicott points out, the child truly exists only when he benefits from his mother's attention while simultaneously becoming aware of the other people in the mother's life (Altman et al., 2002). These become fundamental for the formation of his identity especially because this conflict generates jealousy and triggers the development of his ego.

According to Jungian theory, it is natural for the child to feel nostalgic for the mother because there is in every one of us the wish to remain children under the protection of the preferred parent who represents Eden. The return to the mother becomes a quest for the child whose aim is to be reborn on a superior level. Until birth, the child is physically part of the mother and subsequently remains psychologically dependent on her. This explains why he seeks her in other women, as seen in the autobiographical confessions of Luigi Capuana (*Ricordi d'infanzia*, 1893) and of Edmondo De Amicis (*Ricordi d'infanzia e di scuola*, 1901). Both admit to listening to old tales which played on their imagination during the night. Capuana confesses that in this scary turmoil, the kind face of Facciabella appeared (which in reality is the statue of the Virgin Mary) and took him in her arms till he calmed down:

'[...] una bellissima signora, vestita di raso bianco con galloni e ricami d'oro. I biondi capelli le splendevano attorno al capo come un'aureola, ma i lineamenti del viso e gli occhi suoi erano immobili; pareva ch'ella avesse il viso coperto da una maschera di cera. S'inoltrò lentamente fino alla sponda del mio letto, guardandomi fisso, mi prese ignudo su le braccia e mi portò via con sé [...]' (1965, p.142).

Carlo Dossi narrates the Oedipus complex from an ironic perspective in *Amori* (1887), a semi-autobiographical novel that narrates the author's experiences of love between illusion and reality. As Graziella Pagliano explains, this process is a revelation of the self, a critical analysis of the self, compared to our sense of the Other. Dossi's first love is the Queen of Hearts, an annunciation of pure and genuine feeling for a woman who is far superior to common women. Ten-year-old Dossi feels the urge to possess her and the power she embodies, and he is invaded by a sense of rebellion at seeing other men touch her with their ugly fingers. Then his object of love becomes the Holy Virgin who hovers above his head; the boy cannot accept the sense of satisfaction experienced by her earthly husband, St Joseph, who

does not deserve such a lovely doll, a 'bambolotta in veste rosa e turchina' (1987, p.15). Kissing her gives him a sense of sexual orgasm as sensual emotions invade him and he sleeps happily as if he were an adult who appears satiated after sexual intercourse. It is evident that these female figures represent the mother whom the son is desperately trying to seduce. The alteration between illusion and reality materialises when he senses a hand on his forehead and sees his mother looking at him lovingly while fantasy locks with reality.

Another example of the Oedipus complex in Italian literature is Luigi Pirandello's short story *Un ritratto* (1922) where the relationship between mother and son is so strong that they intensely identify themselves with one another. Indeed, the author evokes a game of mirrors so as to underline the idea that one cannot live independently of the other: when looking at his mother, the son feels he is looking at his own soul, his double without flaw. This intimate bonding helps the child reach out to the outside world, as the mother 'filters' the harsh reality to provide her son with a sense of security. When this fails, the child becomes aggressive, everything acquires a feeling of illusion as he aches to return to his mother, who represents the roots, the origin of life. Yet Pirandello also stresses the adult's dependence on the child in the hope that the son becomes a better adult than himself. If this does not occur, the parent's desire for immortality is broken and the adult enters a moment of crisis (Biagini et al., 2002).

The son's obsession with the mother can also be encountered in Grazia Deledda's *Cenere* (1904) where feelings are as primitive as Sardinia, the island that serves as background to the story. Fifteen-year-old Oli gives birth to Anania, on whom she vents out all her anger after having been seduced and abandoned by a married man. The son lives only to win her love and understands that, being a 'bastard', he is the cause of all her tears. Although she abandons him, Anania is obsessed by his mother's memory, by the need to be treated as a son while questioning the reasons for his birth: 'Ma perché son nato io? Perché mi hanno fatto nascere?' (1973, p.197). This trauma provokes the loss of his future wife and the tragedy of Oli's suicide, in her desperate attempt to break the ties that bind them together.

The absence of the mother in a child's life results in an abnormal childhood and in a sense of loss as portrayed in Carlo Collodi's *Pinocchio* (1881). The puppet is given life by a male figure who has to provide food, shelter and affection; yet Pinocchio flees all the time, driven by nostalgia for the mother, represented by forest trees. The fact that he is desperately seeking his mother proves that the naughty puppet is capable of true love, denoted by his perpetual hunger. To a certain extent, the Fairy compensates for this yearning for maternal love, even though she is an ambiguous figure who performs various roles: mother, sister and child. She is an expression of strength, symbolised by her long hair like Samson in the Bible, and whose blue colour recalls the Holy Mother. Except for the Fairy, the book is populated by male figures and this explains the sense of solitude that overpowers the characters. Even in the 'Paese dei Balocchi', the land of play, the description of the boys playing alone instils

a sense of loss which culminates when they become donkeys. Many do not survive, but Pinocchio, who learns to love his father inside the womb of the whale, rises from the sea as a new being that has developed from the typical 'enfant terrible' to the desired 'ragazzo perbene'.

As in Collodi's fairytale, Giovanni Verga shows that the absence of the mother in the life of a young boy renders the latter so insignificant that others are compelled to take advantage of him. In *Rosso Malpelo* (1878), the young lad is considered unworthy of his mother's love because of the red hair that characterises him; Gregory Lucente explains that this is why he has no real name and why, according to the village people, he deserves to be treated as a beast (1995, pp.90-93). The young 'caruso' is surprised at seeing Ranocchio's mother cry for her son; his mother never touched him nor was she ever affectionate towards him. His need to counterbalance this loss makes him seek the love of another mother: the cave which binds him to his father. The cave becomes his reality, the physical space where dirt and ugliness do not matter, and where the colour of his hair, which usually marks him as an outcast, is in tune with the environment. The world outside the cave becomes alien to his real underground reality which strives to bind him with his father and where he can live his childhood. Malpelo's biological mother fails to accept him because he earns less than her husband did; this brings about a sense of guilt in the lad who is incapable of loving himself and who develops a fetish attitude towards his father's tools and clothes while touching them with devotion. Malpelo learns to identify with the father figure as, according to Eagleton, he 'symbolizes a place, a possibility, which he himself will be able to take up and realize in the future [...] the boy makes peace with his father, identifies with him, and is thus introduced into a symbolic role of manhood' (2008, p.134). In turn, the society to which he belongs rejects him; it follows in the mother's footsteps as is demonstrated by the workmates who abuse and insult him. At the end he chooses death inside the cave because down there he can maintain his uniqueness; it is where he belongs, inside the womb of Mother Earth who finally transforms him into a myth.

Whereas Verga portrays the identification between father and son, in the novel *L'innocente* (1892) by Gabriele D'Annunzio, there is a sense of rivalry between the two. The husband, Tullio Hermil, narrates with a realistic sadism how his wife's pregnancy – following an adulterous relationship – risks shattering their marriage. For Tullio, the child is an intruder and a usurper who wants to dominate his wife's life whereas for the wife, Giuliana, the son is tangible proof of her debauchery. D'Annunzio enhances the rivalry that set Tullio and the unborn child apart, especially the torment at the certainty that it will be a male child who will inherit his family name and become the rightful heir of the Hermils. The vocabulary employed evokes images of war: *lotta*, *nemico*, *avversario* (1968, p.254) as the 'father' prepares each and every detail of the child's death in order to remain the only male figure in his wife's life.

Although most literary works of the late 19th century focus on the son, in her second thesis *Speculum* (1974), Luce Irigaray questions parental ties and the marginal

role of the daughter in a society where the son has always prevailed. This explains why theories of the Electra complex developed at a later stage and concentrated on the relationship between father-daughter and mother-daughter as opposed to the studies about the son. Claude Lévi-Strauss shows in his anthropological studies that the daughter has always been considered a gift to the father, who can 'use' and 'exchange' her by marrying her to someone who will improve the economic and social situation of the family.

This attitude stands in stark contrast to Sibilla Aleramo's autobiography, *Una donna* (1906): her sense of security stems from her father's affection through which he transmits his virility and courage, upon elevating her to the apex of his world. The Electra complex is described in its full force as the daughter gloats in her realisation that she is the chosen love of the father. Their relationship is described with sensuous words that evoke incestuous allusions as the girl confesses that she lived only for his love, he who is emblematic of life's beauty:

'L'amore per mio padre mi dominava unico. [...] Era lui il luminoso esemplare per la mia piccola individualità, lui che mi rappresentava la bellezza della vita: [...] egli sapeva tutto e aveva sempre ragione. Accanto a lui, la mia mano nella sua per ore e ore, noi due soli camminando per la città o fuori le mura, mi sentivo lieve, come al disopra di tutto' (2007, pp.1-2).

She admits reaching the culmination of her senses each time her father took her hand in his as they walked together like two lovers. The writer confesses that, despite her young age, she actually deemed herself a seductive woman whose first victim was her father whereas her insignificant mother remained the Cinderella of the house. In her obsession with her father, she refuses to learn female chores and is oblivious to the village people calling her *demonietto* while making the sign of the cross when she passes by. Aleramo reveals her fear of being abandoned by her father, which in fact becomes reality when he engages in an affair. She consequently feels forced to seek the arms of a man who rapes her, while the father fails to accept that his child has been possessed by another man.

Hélène Deutsch sees the female development as exceedingly difficult and tortuous due to the fact that at some point she must transfer her primary sexual object choice from her mother to her father (and therefore to male figures), if she is to attain her expected heterosexual adulthood. According to Deutsch, the girl blames her father, not her mother, for the lack of a penis; so she stops identifying with her father and identifies herself with her mother instead. In the traditional mentality, the daughter discovers her mother only when she herself gives birth; in this way, destiny leads only to one direction which is not necessarily satisfactory, as proved by the female tragic figures of Verga's Isabella or Capuana's Giacinta. Hélène Cixous opposes this theory by saying that the mother's body can also be discovered through writing, because a woman writes not with a pen but with her milk:

Anche se la mistificazione fallica ha generalmente contaminato i buoni rapporti, la donna non è mai lontana dalla “madre” (che io intendo come ruolo, la “madre” come non-nome e come sorgente dei beni). Sempre in lei sussiste almeno un po’ del buon latte materno. La donna scrive con l’inchiostro bianco (1997, p.229).

The Electra complex is echoed in Pirandello’s *Zafferanetta* (1922) where the love of the father, Sirio, for his African daughter is far greater than the affection for his wife Norina and the son to whom she is soon giving birth. The girl is Sirio’s pride in spite of her peculiar talk (*bombo, bua, n’gu*), the strange colour of her skin, her squashed nose and her enormous lips. The girl is described enviously by the wife who fails to understand how her husband is obsessed by this *scimmietta* and whose appearance explains the nickname Zafferanetta, the colour of sulphur. The girl twists them all around her little finger and proudly describes her father as *mio* as he wolves her down with kisses. She even imposes on him to choose between his wife and baby in Italy and herself; by refusing to adapt to European life, the little girl manages to take him with her back to Africa where he can live exclusively for her.

This strong tie between father and daughter is the cause of tragedy in Francesco Mastriani’s *Medea di Porta Medina* (1882). Coletta, the main character, uses her daughter to blackmail the man who has seduced her, into staying with her. She feels like an outsider and considers her child Cesarina a rival while Cipriano consumes the baby with kisses. Coletta is a strange mother who feels excluded from the invisible bonding that ties her man to the baby. As Simone De Beauvoir explicates, the relationship between mother and daughter is complicated because it alternates between affection and hostility (1988, p.309). When the mother brings up the daughter like a copy of herself, she feels pride but also bitterness. As exposed in the novel, Coletta accuses Cipriano of loving the child more and takes out her anger on Cesarina when she understands that her lover is distancing himself from them. When Cipriano seeks the arms of another woman, Coletta fails to identify her daughter’s pain of abandonment with her own and takes revenge on the child during Cipriano’s wedding. Upon hugging her daughter to her heart for the first time, Cesarina ironically calls her *Pa* as he is the one who usually embraces her. Like a heroine of the classical Greek theatre or the tragic figures of Racine, the Medea (witch) strangles the baby he loves, bangs her head on the floor and hands the parcel to the newlyweds.

While this might seem obscene and unnatural, Elizabeth Badinter insists that a woman is not obliged by nature to love her child as it is not part of her instinct. It was Freud’s psychological assessment that rendered the contact with the mother the key to the child’s psychological health, which pushed women to feel this maternal instinct. Therefore, maternal love is a gift which a woman can refuse (Badinter, 1981, p. IX) and this explains why so many mothers abandoned their unwanted child, a mode of behaviour considered unnatural by society. An example of this can be found

in *Tortura* by Capuana, where Teresa refuses her unborn baby and describes him as *incestuosa creatura* (1988, p.314). She clings to the idea of abortion because she cannot love him and yet, she feels guilty about it. When forced to kiss her newborn son, she feels the lips of the man who raped her and psychologically rejects her son, a reaction which causes the baby's death after a long period of pain.

The above reflects how literature becomes a tool in the process of understanding how parents' roles have changed with time. In 19th century literature, the mother's role is stereotyped in that she is depicted as a symbol of equilibrium and, as the angel of the house, she is endowed with a level of beauty attributable to her good nature. During the 20th century, the mother shows signs of rebellion and fluctuates between feelings of jealousy and frustration, and is sometimes unable to love her own children. Jung states that the mother is no longer a myth and neither is she sacred because she has lost her archetypal and traditional role (1981, p.31). This ambiguous behaviour sees mothers treating their offspring like a pet, alternating kisses to feelings of irritation, thus further confusing the child, who in turn gradually loses his self-respect. In *Gli spostati* (1883), Matilde Serao presents a modern mother whose little son finds her awesome: he is fascinated by her lacy housecoat but she ignores him; at times he becomes her doll and she dresses him up over and over again, even like a female. Only appearances count as she forces the boy to accompany her in the carriage while men pass sensuous comments which the child fails to understand. His priority is to ensure that he is not abandoned by his preferred parent and his attempts at gaining her attention become fundamental to the development of a relationship within himself on the one hand, and with the world around him on the other.

As a popular saying goes, 'the hand that rocks the cradle rules the world', generally referring to the mother who is the child's first love, his original ruler, the centre of his universe. Yet the literary works analysed epitomise the importance of the father figure, at the centre of both the Oedipical and Electra complexes. As delineated, literature lists numerous examples of the significance of the parent-figure with respect to the child's psychological, emotional and social well-being.

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Bio-note

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A Bridge Too Far?

Reflections on Theory in Educational Practice

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Abstract

Praxis is a notion underlying several educational theories and it has led to the development of different models of teacher education. Locally, this has also been one of the concepts discussed during the 'masterisation' of the teaching profession, by virtue of which pedagogical content knowledge builds on prior-achieved content knowledge. As teacher education in Malta was reformed, a number of unprecedented socio-economic developments created a scenario which, at policy-making level, brought about further educational reforms. These include an outcomes-based model for learning and assessment and a drive towards vocational education. In this presentation, I refer to data regarding teacher-student ratios, as one aspect of the contextualization of education locally, and I proceed to reflect upon two educational documents, using Critical Discourse Analysis. I argue that the cyclical nature of praxis, which requires reflection and action, is somewhat side-lined within the current educational context, possibly because immediate instrumental gains are being prioritized.

Keywords: *Educational theory; Critical Discourse Analysis; Educational policy; Praxis in Education.*

Introduction

This contribution needs to be contextualised in my own narrative as an academic and as a teacher educator as this determines, to a greater or lesser extent, my interpretation of the data and of the documents that I will refer to. My main field of expertise is Italian and matters that revolve around Italian language education as a branch of Sociolinguistics and of General and Applied Linguistics. Although most of my research has been dedicated to linguistic matters, my academic home has always been the Faculty of Education, not least because I read for Bachelor of Education (Honours) and Master in Education degrees which I was awarded, respectively, in 1991 and 1996. My involvement in teacher education was always flanked by my interest in Linguistics, and these two areas found complementary grounds throughout my PhD, completed in 2001, in which theoretical linguistic notions

were applied to the acquisition and learning of Italian. Throughout my academic career, I became increasingly aware of the importance of educational theory and its contribution both to the methodology of language teaching and to the professional formation of teachers. This was especially the case when in 2013 I was appointed Deputy Dean of the Faculty of Education and subsequently served as Dean between 2015 and 2019.

While, as a methodologist, I focus mainly on the practical, day-to-day needs of teachers and student-teachers, I gained further insights into education as a political and social activity, without forgetting its personal and intimate dimensions. This materialised especially through my readings on educational theory as well as by means of engagement with local and foreign colleagues who are specialised in this area. Theory and practice come together through praxis, in a cyclical process, and while the former is sometimes implicit and not immediately evident, its effects on choices made by teachers in our classrooms, the textbooks we adopt, modes of assessment, policies that are issued, educational legislation, and so on, are extremely far-reaching.

The data and reflections I include in this paper regard reforms being brought about in our educational system, in the light of on-going changes and challenges. In the first part of my contribution, I address some of the issues that are topical today in Malta's education. I then refer to two local educational documents: *The framework for the education strategy for Malta 2014-24* (FESM), launched in February 2014 and *My journey: achieving through different paths* (MJ), presented officially in November 2016. My main tool for the analysis of these documents is Critical Discourse Analysis (CDA), as through this I delve into them from a linguistic point of view by investigating the discourse used. The main objective of this exercise, including the presentation of data and analyses of the two reforms, is to reflect on whether space is being given both to theory and practice, and on whether one is being prioritised over the other.

History and Data

Our educational system reflects the history of our country. A few milestones, thoroughly documented in Sultana (2017), include the Austin & Cornwall-Lewis 1838 report, which represented the first serious attempt to address schooling in a systematic matter and tackle the mass illiteracy of the time, Paolo Pullicino's pioneering contribution to education in the mid-1800s and the Keenan 1880 report. The language question (Hull, 1993), whereby Italian as a medium of instruction gave way to English, as well as the gradual increase of importance given to Maltese in schooling also represent important stages and they are reflected in the events that occurred in local history. The same can be said about the founding of the Malta Union of Teachers (MUT), established in 1919 as consequence of the Sette Giugno

riots, in order to strive for better working conditions for teachers since the category had been largely ignored by the government of the time, despite the political strife which led to improved conditions for a number of work sectors.

In the post-war years, teacher education gained ground as a discipline in its own right, both through the development of the field internationally and through the establishment of teacher-training colleges locally. This was largely in the hands of institutions which were administered by the Church until, in 1978, the Faculty of Education was established as a result of Amendments to Education enacted by the 'new' University. The universitisation of teacher education was characterised by the introduction and development of a number of courses on educational theory, among other ambitious goals at the time, such as the professionalisation of teaching. Theories in education were mainly within the remit of courses in Philosophy, Psychology and Sociology of Education, fields which all education graduates are highly familiar with. However, they also carried implications for the whole teacher education programme, including courses in Pedagogy, Methodology and the Practicum sessions. More recently, following agreements with all stakeholders reached in 2014, and draft legislation in this respect proposed in 2016, teacher education has been raised to Master's level.

Teacher education, and the profession in general, has a history in which matching demand and supply represents a challenge. Up to a few years ago, for example, graduates from the Faculty of Education who specialised in some subject areas found it hard to be employed in local schools. A number of them abandoned teaching without ever being engaged. The demographic rate locally was not increasing as steeply as it had been in the past and the School Networks (known as Colleges) reform in 2006 effectively led to the closure of some public schools, with students being integrated into larger institutions. This process was also the result of the introduction of comprehensive schooling by virtue of which the Junior Lyceums and Area Secondary school system was removed. This dichotomous school system, in which students were placed in different schools according to their academic achievement, determined by an 11+ examination, has now been phased out, with the last examination of this kind being held in 2010. This was replaced by a benchmarking assessment system which, reportedly, will be removed in the coming years. In addition to this reform, in 2014 co-education was introduced to state secondary schools, so today all the public schooling sector is co-ed, as is the private sector. Secondary education in church schools is still single-sex.

These changes have also had implications on teacher recruitment, for which I present figures regarding class teachers during scholastic year 2018-19. The figures I report do not include instructors, peripatetic and support teachers as well as those who carry out duties in resource centres. However, it must be noted that in 2018-19 there were 626 peripatetic/support teacher who were employed in state schools, in contrast with a total of 50 covering both other sectors. The figures reported in Tables 1-4 were provided by the Ministry for Education & Employment, in June 2019.

Table 1: Teacher data 2018-19 in State schools

State schools			
Grade	Primary	Secondary	TOTAL
Supply teacher	81	93	174
Teacher	920	2,023	2,943
Total	1,001	2,116	3,117

Table 2: Teacher data 2018-19 in Independent schools

Independent schools			
Grade	Primary	Secondary	TOTAL
Supply teacher	130	92	222
Teacher	102	198	300
Total	232	290	522

Table 3: Teacher data 2018-19 in Church schools

Church schools			
Grade	Primary	Secondary	TOTAL
Supply teacher	42	94	136
Teacher	354	841	1,195
Total	396	935	1,331

Table 4: Student data 2018-19 (obligatory schooling 5-16 years of age)

School	Primary	Secondary	TOTAL
State schools	15,492	11,279	26,771
Independent schools	3,701	2,394	6,095
Church schools	7,794	7,118	14,912
Total	26,987	20,791	47,778

When teacher-student ratios are worked out on the basis of these figures the following results are obtained (Table 5):

Table 5: Teacher-student ratio 2018-19

	Not including supply teachers	Including supply teachers
State schools (primary)	16.8	15.5
State schools (secondary)	5.6	5.3
Independent schools (primary)	36.3	16
Independent schools (secondary)	12.1	8.2
Church schools (primary)	22	19.7
Church schools (secondary)	8.5	7.6

These figures indicate that there are substantial differences between the three educational sectors, and that the best teacher-student ratios are in the public sector. In general, these figures compare favourably to those of several EU states, as referred in Eurostat data (available up to 2017). The EU average is 14.7 for the Primary sector and 12.2 for Secondary.

These ratios, however, only provide a partial picture of the situation, and they conceal the complexities of the profession. In fact, despite generally favourable teacher-student ratios, there are indications that the country is facing shortages in a number of subject areas and there is the possibility that this problem could become more acute in the future. In fact, practically all teacher education graduates of the Faculty of Education have found definite or indefinite teaching posts in the past two years, unless they decided not to join the profession out of their own choice. What has led to this change, when compared to the aforementioned situation of faculty graduates not finding employment in schools?

One of the reasons is that our schools seem to be requiring more teachers than they did in the past, although the reasons for this are not explicit. The local journalist Arena (2019), in an article published in the Times of Malta, quotes the Ministry for Education and Employment to refer that a total of 10,372 teachers are employed in our schools, 66.6% of whom are in state schools, and 33.4% in the Church and private sector. These, presumably, include also figures of peripatetic, support and guidance teachers, not included in Tables 1-4 above (in which I report figures pertaining to scholastic year 2018-19), as well as kindergarten assistants. They cater for a total of 60,940 students (including those in kindergarten settings) which effectively means that there is one teacher for slightly less than every 6 learners in class, as the teacher-student ratio stands at 1:5.85. The same article refers that there has been an overall increase in the employment of teachers with an additional 200 being engaged in 2019. Reference is also made to an increase in the amount of kindergarten assistants and learning support educators, as well as to figures regarding the number of students in public schools who have opted for a vocational subject, reportedly amounting to 60%.

On the basis of this data, we cannot ignore the possibility that several educational reforms as well as changes in school demographics may be spreading teachers out too thinly, with the consequence that some are given heavy loads, in time-tabling terms, while other have to focus their attention on smaller classes, sometimes including learners who require specific attention.

Having provided data regarding our educational system today, and having described some matters regarding the present situation in schools, I now turn to the two aforementioned educational documents: *Framework for the education strategy for Malta 2014-24* (FESM), published by the Ministry for Education & Employment (MEDE, 2014a) and *My journey: achieving through different paths* (MJ), published by the same Ministry (MEDE, 2016). These have been chosen because of the importance given to both in the discourse on education locally. The

FESM preceded the introduction of the Learning Outcomes Framework on which the recently-introduced outcomes-based model of education has been shaped, as stated in the document itself: “Other objectives include the provision of a relevant curriculum built on a learning outcomes approach, a variety of learning experiences and qualifications anchored to the Malta Qualifications Framework” (MEDE, 2014a, p.5). This model is referred to, albeit briefly, in the MJ document which led to the introduction of new vocational subjects in our state schools which are proving attractive to a substantial number of students, as reported earlier. MJ has recently been described by the Permanent Secretary (Fabri, 2019) as “our collective moral purpose”.

Although it is acknowledged that priority in both these educational documents is given to practical matters, the very notion of praxis suggests that practice devoid of theory is a misnomer in itself:

Praxis, as conceived by Aristotle and reconceptualized by Marx, requires one to practice what one theorizes while ... theorizing what one practices: reflective action and active reflection make for good praxis.

(Weltman, cited in Torres & Mercado 2004, p.61)

So, even though policies issued by educational authorities may have a strong instrumental orientation it is interesting to uncover whether there are any explicit theoretical underpinnings through their discourse and to explore what is being prioritised or sidelined. My aim is to analyse some aspects related to the discourse in both documents from the perspective of Critical Discourse Analysis.

Critical Discourse Analysis

Critical Discourse Analysis (CDA) ‘includes not only a description and interpretation of discourse in context, but also offers an explanation of why and how discourses work’ (Rogers 2004, p.2). The same author adds that “researchers working within this perspective are concerned with a critical theory of the social world, the relationship of language and discourse in the construction and representation of the social world, and a methodology that allows them to describe, interpret and explain such relationships” (Rogers 2011, p.3).

CDA therefore explores some of the hidden social, cultural and political concepts that underlie texts. It focuses on the framing of the text, including on how it is presented and the author’s point of view, on its foregrounding and on the background knowledge it presupposes. Other features are found at a conversational or dialogical level, wherein syntactic and textual constructions may be analysed in terms of the way they are structured and of how they establish relations by means of discourse. Space restrictions do not allow me to focus on all aspects of CDA which emerge from

the two documents under study and I will herein refer to the background knowledge of them both, and then carry out analyses based on word frequency, readability and lexical density.

Two official documents

The *Framework for the education strategy for Malta 2014-24* (FESM) and *My journey: achieving through different paths* (MJ) are easily accessible, both in electronic and hard formats, and they are both often cited when reference is made to recent educational reforms which will be formalised through a new Education Act, for which consultations were initially carried out in October 2016. Among the issues which represent the background to the FESM, launched in February 2014, one finds the results achieved locally in TIMSS and PIRLS studies as they “painted a worrying picture” of the educational situation. The increasing demands of the employment sector required “a skilled workforce on a local level” and a “link between education and national development in relation to skills matching” (MEDE, 2014b). The effort being made to address diversity through inclusion and by offering equal opportunities to learners is also included in the background to this document.

On the 23rd November 2016, the MJ document was presented, as part of ongoing secondary education reforms. The launch of the programme was held, symbolically, at the Lufthansa Technik premises. The declared background included reference to UNESCO’s Sustainable Development Goal number 4 with emphasis on a reform that will replace the current “one-size-fits-all system to a more inclusive and comprehensive learning system” (Maltese Eurydice Unit, 2017). The introduction of a number of vocational subjects and different modes of assessment was also given prominence, pitched at Malta Qualifications Framework (MQF) Level 3 (at par with the same European Qualifications Framework level). Parity of esteem between all different subject options “will be guaranteed” (Maltese Eurydice Unit, 2017). These different assessment modes and the equivalency to the MQF Level 3, are a direct reference to the Learning Outcomes Framework, although this was not mentioned explicitly in the presentation of MJ. Another issue that was referred to regards equitable support for all “children’s individual talents and needs through quality academic, vocational and applied learning programmes” (Maltese Eurydice Unit, 2017).

Analyses of the FESM and MJ

In order to analyse the content of both documents I processed them through two text analysers: a simple Online-Utility version, using open use software available at: <https://www.online-utility.org/text/analyzer.jsp> and the Using English advanced text analyser, for which registration is required at: <https://www.usingenglish.com>.

This software carries out text analysis at various levels of linguistic complexity although for my work I limit my considerations to lexical density, readability and word frequency. The general results pertaining to the FESM and MJ documents are presented below:

Table 6: Framework for the education strategy for Malta 2014-24 (FESM)

Parameter analysed	Value	Notes
Number of words	1,376	
Total number of unique words	543	
Number of syllables	2,500	
Syllables per word	1.8	
Lexical density	39.46%	Different words/words x 100
Lexical density (without stop words)	55.31%	Lexical words / words x 100
Readability: Gunning Fog Index	34.06	Postgraduate (29 years)
Readability: Flesch Reading Ease	-10.36	Difficult: High School or Some College

Table 7: My journey: achieving through different paths (MJ)

Parameter analysed	Value	Notes
Number of words	3,447	
Total number of unique words	872	
Number of syllables	6,713	
Syllables per word	1.9	
Lexical density	25.3%	Different words/words x 100
Lexical density (without stop words)	61.27%	Lexical words / words x 100
Readability: Gunning Fog Index	37.86	Postgraduate (32 years)
Readability: Flesch Reading Ease	-27.9	Difficult: High School or Some College

The most interesting aspect of the numerical data is that in both cases lexical density is low, 39.5% in the FESM and 25.3% in MJ. By way of comparison, Johansson (2008, p.65) reports that “the large majority of the spoken texts have a lexical density of under 40%, while a large majority of the written texts have a lexical density of 40% or higher”. Lexical density, by definition distinguishes ‘content’ words (verbs, nouns, adjectives and adverbs) from grammatical ones, sometimes also referred to as ‘stop words’, as in the tables above (prepositions, pronouns, conjunctions, articles). This indicates that both the FESM and MJ documents provide somewhat succinct information, and that they are not intended to go into depth insofar as the issues mentioned are concerned: this is also confirmed by the fact that, in either case, there is no explicit reference to educational theories or to philosophical underpinnings. The Gunning Fog readability index is 34.06 for the FESM and 37.86 for MJ. Both scores

indicate that the documents are not directed to the general public, as the reading level required is at least of graduate standard, both in relation to the terminology used (despite the low lexical density) and the syntactic structures employed. This is, by and large, confirmed by the Flesch Reading Ease index, also reported in Tables 6 and 7.

The reference in the background of both documents to employability, to the achievement of skills (including vocational skills) and to inclusion and equity, emerges also when examining content-word frequency:

Table 8: Content-word frequency in the Framework for the education strategy for Malta 2014-24 (FESM)

	Occurrences	Percentage
1. Education	20	1.43
2. Learning	15	1.07
3. Skills	13	0.93
4. Ministry; Work; Strategy; People	8	0.57
5. Employment	7	0.5
6. Process; Society; Jobs; Current	6	0.43

Table 9: Content-word frequency in My journey: achieving through different paths (MJ)

	Occurrences	Percentage
1. Learning	101	2.42
2. Education	72	1.72
3. Secondary	48	1.42
4. Programmes	45	1.08
5. Vocational; Students	37	0.88
6. System	34	0.81
7. Quality	33	0.79
8. Academic	32	0.76
9. Skills	31	0.74
10. Applied	28	0.67
11. Equitable	25	0.6
12. Schooling	24	0.57
13. Training; Level; MQF; Malta	21	0.5
14. Compulsory; Current	19	0.45

Since the MJ document is substantially longer than the FESM, n-grams – that is the phrases that are used more frequently – also shed some light on the discourse used. The frequency of these 4-word phrases is presented in Table 10.

Table 10: 4-word n-gram frequency in My journey: achieving through different paths (MJ)

	Occurrences
1. equitable quality education for	13
2. academic vocational and applied	13
3. quality education for all	13
4. vocational and applied learning	12
5. to MQF level 3	6
6. and applied learning programmes	5
7. one size fits all	5
8. framework for the education	5
9. for the education strategy	5
10. up to MQF level	5

The word frequency and n-gram patterns for MJ reveal that the words 'education' and 'learning' feature frequently in both documents, with others that refer to 'equity' and 'quality'. The word 'skills' and terms related to employability are also used regularly, especially in the FESM. The MJ document, clearly designed to introduce a vocational path, puts emphasis on this and on the equipollency of this route to MQF Level 3. In fact, the term 'vocational' is often used to make a distinction between this path and the 'academic' one which, by and large, refers to the subjects currently taught in most schools and for which a Secondary Education Certification examination has been available for a number of years. This system is also referred to by means of 'one-size-fits-all' – this catchphrase, often used on the media when referring to these documents, is repeated on five occasions. The distinction between 'academic' and 'vocational' is presented somewhat unquestioningly in MJ, although in contemporary education one may debate as to whether the two should, really and truly, be kept so distinct (Bailey & Belfield, 2019).

Albeit succinct, and by no means comprehensive, the CDA exercise carried out by referring to the background of the documents, lexical density, readability and word frequency, indicates that the two educational documents under examination are contextualized through issues regarding the educational (e.g. achievement), the social (e.g. inclusion and diversity) and the employment (e.g. skills) sectors. The analyses indicates that they can be mainly understood by readers specialised in the field, although in terms of lexical density the proportion between content and grammatical terms indicates that the former are not used frequently, especially in MJ. In both documents explicit reference to theoretical frameworks is largely absent and there is only occasional mention of an outcomes-based model of education which, by and large, has now been adopted in most local schools.

There are some indications of evidence-based considerations (e.g. international test measures, general low achievement in academic subjects, skills' gap) but these

are not corroborated by data included in the FESM or in MJ. Both documents have a very strong practical slant, with emphasis on the link between education, the acquisition of skills - vocational skills in the case of MJ - and employability. Quality education, equity and inclusion are also central features in both policies. In both cases there is no clear indication as to how the policies will affect teacher recruitment, and whether it will be necessary to have Continuing Development Programmes or re-training of teachers already in employment.

Changes and reforms: what about reflection and action?

The documents that I have analysed, albeit briefly and without the pretence that these are representative of the range of documentation issued by the educational authorities in Malta over the past years, are characterised by a discursive style which gives prominence to practical skills, through which the link between education and employability is underlined:

Our children need to be prepared for present and future jobs, and obtain more transferable skills to avoid skill obsolescence (FESM, p.6). Ensuring that our young people acquire the necessary skills and strong work ethic to enable them to take up the jobs created is also a formidable task (FESM, p.6).

In the FESM job-related skills are contextualised within a framework involving lifelong education, achievement and literacy skills:

It is unacceptable that half of our fifth formers are leaving secondary school without the skills and qualifications expected of them after at least 12 years of schooling. We need to link much better the two worlds of education and employment to ensure the relevance of MCAST and the University of Malta to sustain the current employment rate of our graduates (20-34 years), and also improve the skill base of our 25 to 64 year olds (FESM, p.6).

The MJ document hinges on the FESM “values of inclusion, social justice, equity and diversity” (MJ p.1) and refers to a comprehensive system pitched at MQF Level 3 in which learners will be ‘equipped’ with employability skills, in light of ‘current and foreseeable skills shortages’:

We need to ensure that all children develop into young people and adults equipped with the necessary skills and attitudes to be active citizens, equipped with the necessary employability skills and to give valuable contributions in society (MJ, p.2)
Learning programmes could be broadly defined to fall under either a transitional and/or a qualification stream. The former stream prepares

students to further their studies after secondary schooling both in academic or vocational institutions, while the latter prepares students with employability skills which can be used actively in employment. Both streams are complementary and essential for the Maltese labour market due to current and foreseeable skills shortages. (MJ, p.8)

This has implications for our educational system, including teacher recruitment (data on which was provided in Section 2) also insofar as the introduction of new vocational subjects is concerned. There is, however, little background in terms of how these subjects will flank the so-called 'academic' ones, although this dichotomy exists in the MJ document and should be questioned, as I stated earlier with reference to Bailey & Belfield (2019). Furthermore, whether implicitly or explicitly, the drive towards addressing skills' gap and bringing schools closer to industry leaves little space for reflection and action in this document. Rather, a direction is given, as may be seen in the quote below, without explaining whether such action would then require reflection in order to be effective in the long term, even in terms of improving literacy and achievement (as specified in the FESM), in a cyclical process which is typical of praxis:

As has been evidenced through local and international practice, it is advisable that every secondary school partners with post-compulsory general academic and vocational institutions and the industry to facilitate a seamless lifelong journey and progression for all their students. (MJ, p.9)

This, I argue, is leading to a situation where even in some teacher education programmes, which today are not offered exclusively by the Faculty of Education, educational theory - and the very notion of praxis - play second fiddle to instrumental goals. This situation, furthermore, is not only a local matter as similar trends are being witnessed in teacher education in other countries too. Educational theory may be suffering the brunt of this, and as a consequence the cycle of reflection and action has little room, or no room at all, to thrive. Prof Kenneth Wain, in his keynote to the Teacher Education Policy and Practice (TEPE) conference, organised by the Faculty of Education in 2016 summarises this poignantly when he raises alarms with respect to the fate of educational theory locally and internationally, and his arguments summarise neatly the point I wish to highlight:

It needs clarification here that I am not here arguing against teaching teaching skills or competences in teacher education. Indeed, I have been emphasising the point that teaching as a practice is a matter of knowing how, and therefore, inevitably, a matter of having skills and competences of certain kinds (like asking questions, instructing, assessing, presenting, demonstrating, and so on) that are measurable on a performative scale. (...) What I am arguing against is what

Hyland in another article describes as the “one-dimensional, technician approach reflected in the obsession with skills and competences (Hyland and Merrill 2003)” that proceeded from the “‘new vocationalist’ thrust of the late 1980s and 1990s,” for the same reason as his, that it is “‘morally impoverished.” (p.64) For that is precisely what it is; morally and, I would say, politically impoverished also. It is impoverished also by its exceedingly poor understanding of practical knowledge (which various critics have commented does poor justice to vocational education itself), especially when it is compared with the Aristotelian understanding as praxis, and therefore as rooted in the world not in a craft, which I have just described (...)

(Wain, 2018, p.58)

Conclusion

The local Maltese educational system is facing many challenges. Certain issues are the result of unpredictable trends, such as the significant increase of migrant learners in our schools (Caruana, Scaglione & Vassallo Gauci, 2019), some of whom reach our shores without any knowledge at all of either of the two languages of instruction, English and Maltese. Others, on the other hand, such as teacher recruitment, can be addressed if plans are made accordingly, both insofar as the short-term and the long-term are concerned and if educational documents also provide evidence of these plans in the light of the reforms they are proposing.

Figures concerning teacher-student ratios indicate that the teaching complement in Malta is spread out thinly and unevenly. The reasons for this are multiple and it is acknowledged that there are cases where small-group learning, and specific individual attention, reap benefits. On the other hand, it is undeniable that there are high numbers of qualified teachers who do not carry out duties with a full class, otherwise the recent shortage alarm would not be as insistent as it has been over the past months in the media.

The discourse of the two documents examined, while rightly focusing on quality and on inclusion, has a slant towards education for employability purposes. The consequent increase of subject options might complicate issues related to teacher deployment, especially if one is intent on safeguarding quality within the profession. Teachers qualified to teach ‘academic’ subjects might have to re-train to be routed to ‘vocational’ areas, although this does not necessarily mean that they will feel accomplished in the process, especially if there is a distinct separation between the two fields.

The discourse in both documents presents sporadic reference to theoretical grounding, and the notion of praxis, as described in Prof Kenneth Wain’s words quoted above, does not come across clearly. This may reinforce the erroneous, but

widespread, public perception that teaching is largely skills based and that it may not require an array of critical faculties in order to cognise that it is, ultimately, a social and political endeavour. While it is inevitable, and understandable, that aspects of a technocratic approach weave their way into official documentation, there is much at stake if schools start singing to the tune of industry, unquestioningly and unassumingly.

The masterisation of the teaching profession, brought about through the introduction of the Master in Teaching & Learning (MTL) as agreed by all stakeholders in 2014, is based on a model wherein the cyclical nature of praxis is central. During discussions leading to this, evidenced in the documentation produced (reference to which is included in Sultana, Gellel & Caruana, 2019) the Faculty of Education at the University of Malta invested a great deal of energy to reform its teacher education course and to bring it in line with some of the most successful programmes internationally, taking into account, for instance, the characteristics identified by Darling-Hammond (2013).

My main critique, in this paper, is not towards the education documents per sé but towards the fact that the current context, and the discourse linked to it, is sidelining theories in educational practice which are running the risk of becoming the proverbial 'bridge too far', thereby undermining quality in the teaching profession.

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Bio-note

Professor Sandro Caruana is Professor of Italian Language Teaching Methodology. He is a former Dean of the Faculty of Education (2015-19) and a member of the Dept. of Languages & Humanities in Education. He holds courses on Italian language teaching and learning, Italian Linguistics, Sociolinguistics and intercultural communication. His other areas of interest include multilingualism, language attitudes, second language acquisition and the Romance element in Maltese. He has participated in international projects on intercultural

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Stress-Related Factors Affecting Teachers of Foreign Languages in Maltese State and Church Schools

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Abstract

While stress, and the causes that lead to it, is widely documented in studies regarding the teaching profession, this study focuses specifically on teachers of foreign languages and seeks to shed light on whether they are affected by stress in the light of a changing local educational and sociolinguistic scenario. Our main findings reveal indications that stress levels among teachers of foreign languages are considerably high, and that these are not affected by the language that they teach. Furthermore, there are significant stress level differences between teachers in state and church schools, with the former being more negatively affected by stress than the latter. Stress levels are linked to job satisfaction, with those who feel fulfilled by teaching clearly being impacted less by stress factors related to the profession.

Introduction

Stress has been defined in many ways and, in broad terms, it may be caused by different factors and be the result of both personal (internal) circumstances and diverse (external) life situations. The American Psychological Association (<https://www.apa.org>) cites the work of Baum (1990) to define stress as any uncomfortable emotional experience accompanied by predictable biochemical, physiological and behavioral changes.

Teaching is a demanding profession and teacher stress is well documented, with findings indicating that several teachers experience stress as a result of their work. Stress in the profession is not a recent phenomenon, as attested by numerous works carried out in the past both locally (Borg & Riding, 1991; Cassar & Formosa, 2011; Mizzi, 2018) and internationally (Travers & Cooper, 1996; Pang, 2012; Richards, 2012; Zurlo et al., 2013; Ho, 2017). A recent newspaper article in *The Guardian* (UK) by Busby (2019) refers to the National Foundation for Educational Research (NFER) to report that teachers feel more stressed than other workers, with one in five reportedly feeling ‘tense’ about their occupation.

In most cases, several factors cause this, including poor recognition of the profession and its contribution to society, as well as a lack of adequate resources and

salaries, which are generally considered inadequate. Most studies carried out deal with stress as a general phenomenon, which spreads across different sectors (early years, primary, secondary and post-secondary) in which teachers are employed. In our specific case, attention is focused on teachers of foreign languages, especially towards those who teach Italian. This is because foreign language (FL) teaching and learning has undergone changes in the past years. While some of these are the result of several reforms being implemented (for example, the 2012 National Curriculum Framework, the move towards an outcome-based model of education initiated in 2015 and the recently-introduced new 'vocational' areas), both in teaching and in assessment, others are of a more generic nature and are linked to sociolinguistic changes experienced in Malta. The overarching role of English has led to a situation where learning foreign languages is not deemed as necessary, or as useful, as it was in the past, since English is generally used as a *lingua franca* for communication and work purposes both locally and internationally. Italian in Malta, as widely documented (Caruana, 2013; Caruana & Pace, 2011, 2015 & 2019), has undergone a possibly unprecedented sociolinguistic shift. In the space of a few years, exposure to it has decreased drastically and, what once was a popular language among the Maltese, has now become a *sensu stricto* foreign language. Within this context, it is therefore interesting to view whether these changes are a cause of stress among teachers of these languages.

Review of the literature

Borg and Riding (1991) carried out a local study on teacher stress, based on a self-administered questionnaire. Results, which are based on the feedback of 545 educators, demonstrate that 33.6% of the professionals consider their job as either very stressful or extremely stressful. It is interesting to note that males report greater stress than their female counterparts. In view of the Teacher Stress Inventory (TSI), especially designed for the study, the five major causes of stress are: students' demotivation, lack of adequate resources for teaching, crowded classrooms, a vast syllabus and poor prospects for career improvement.

Another study by Borg et al. (1995) was used to corroborate data from the previous study. Through another TSI, researchers concluded that the major causes of stress are those already attested in the earlier study referred to above, with the addition, however, of another factor: work overload. In fact, together with student misbehaviour, this is considered a major source of stress. An EU funded survey (Billehøj, 2007), in which Malta was represented by the Malta Union of Teachers (MUT) places the following stressors, in descending order, as the major cause of concern in the profession: workload / working intensity; role overload; increased class size per teacher; unacceptable pupils behaviour; bad school management / lack of support from management.

Another study carried out locally (Cassar & Formosa, 2011) provides similar results, with 37.3% of the sample indicating that they feel stressed. Contrarily to what Borg and Riding (1991) attest, in this study female teachers are more affected by stress than their male counterparts. Results also indicate that Area Secondary school teachers are more susceptible to stress than their Junior Lyceum counterparts. This finding is linked to these students' lack of motivation. With respect to this outcome, it is necessary to add that this dichotomous schooling system, in which students were placed in different schools according to their academic achievement determined by an 11+ examination, has now been phased out, with the last examination of this kind being held on May 6th, 2010. This was replaced by a benchmarking assessment system which, reportedly, will be removed in the coming years.

A more recent study conducted by Attard Tonna and Calleja (2018) revealed similar findings. 62% of the respondents to a questionnaire declared that despite the challenges of the profession, they are satisfied with their career. Yet, a perturbing finding emerges from this study: 36% of the respondents indicated that they would leave the profession if the right opportunity arose.

Although Attard Tonna & Calleja (2018) do not refer directly to stress, they document several factors regarding the choice made by teachers to join the profession and their contentment with this choice:

"I have an innate passion for teaching, the way a teacher can inspire others to pursue what their heart desires is what motivated me to get into teaching."

(Attard Tonna & Calleja, 2018, p.25)

A high percentage of professional educators is clearly gratified with their chosen career: 89% claim not to imagine themselves in another profession, which is a proof of their commitment towards teaching. Nevertheless, recent reforms in the education system, the lack of respect towards the profession and a salary deemed inadequate have led the remaining 11% to declare that they cannot keep on doing what they have studied for.

The researchers conclude that in order to attract new teachers and to keep those that are already in the profession, some measures are needed. These include a fair increase in current salaries, adequate working conditions, and the reassurance that necessary actions taken in class are met with the right structures, both within the school and beyond (Attard Tonna & Calleja, 2018).

Mizzi (2018) carried out a study based on semi-structured interviews with six teachers employed in state secondary schools, the outcomes of which are studied through interpretive phenomenological analysis. The main aim of her work is to "explore educators' notions of wellbeing so as to develop an understanding of teacher wellbeing as it relates to the Maltese context" (Mizzi, 2018, p.22). Results indicate that teachers need time to 'acclimatise' to the profession and that wellbeing is related to students' behaviour. Misconduct is, in fact, considered a matter of serious

concern, while conversely, collegiality among professionals is seen as mitigating negative feelings and contributing to one's wellbeing. The role of school leaders is also mentioned, with lack of support also causing concern insofar as one's wellbeing is involved. Within the limited remit that this study entails, with results based on a qualitative methodology that cannot be generalised, it is important to note that for all participants, despite being relatively young, "the prospect of teaching as a lifelong career was considerably daunting" (Mizzi, 2018, p.47).

Locally, there is no specific study that deals with issues of stress regarding teachers of foreign languages. Internationally, however, among the plethora of research carried out on this matter, some of which were mentioned earlier, some studies have been dedicated specifically to teaching and learning languages.

In a study carried out by Weinstein and Trickett (2016), the authors develop a measure in order to highlight stress factors specifically related to teachers of English language learners (ELL) across the United States. These are teachers who work with immigrant and refugee students, who offer support in addition to the teaching and learning that occurs in mainstream settings. Despite being limited to 98 participants, this study reveals some stress factors which are subject and context related, including preparing ELL for mandated testing, dealing with 'inappropriate' placements of students in relation to their level and carrying out administrative paperwork that is not usually done by mainstream teachers. In this case, one must point out that the language dealt with – English in the US – is a context language, and therefore bears a different status to FLs.

A qualitative study (Acheson et al., 2016) with teachers of Spanish, French and Latin was carried out in the state of Georgia, US. What emerges is a milieu characterised by a lack of interest in foreign languages because of the overarching role of English in this state. The rich thematic analysis yields five reasons for which practitioners in this particular environment perceive difficulties in their career. These include a perceived lack of community and institutional support for FL teachers, difficulties related to motivation, emotional burnout and an apparent lack of teacher efficacy. Together, these can inexorably lead to burnout and attrition.

Settings and Sample

This study, in which we refer to some of the main findings of the Master in Teaching & Learning dissertation by Borg (2019), stems from the outcomes reported above regarding teacher stress. It is based on the same Teachers' Stress Inventory (TSI) originally designed by Borg and Riding (1991), since this is the only standardised inventory which has been used in the local context. Having obtained permission from the main author to modify some items, the inventory was adapted in order to align it to today's educational scenario and to relate specifically to the 108 teachers of foreign languages in State and Church schools comprising the main sample of this

work. These represent 33.7% of the number to whom the questionnaire was sent via Google Forms, namely the full complement of 160 teachers of Italian and 160 teachers who teach other foreign languages in the State and Church sector.

The two tables below provide information regarding the age, sex, school sector and the subject taught by the participants:

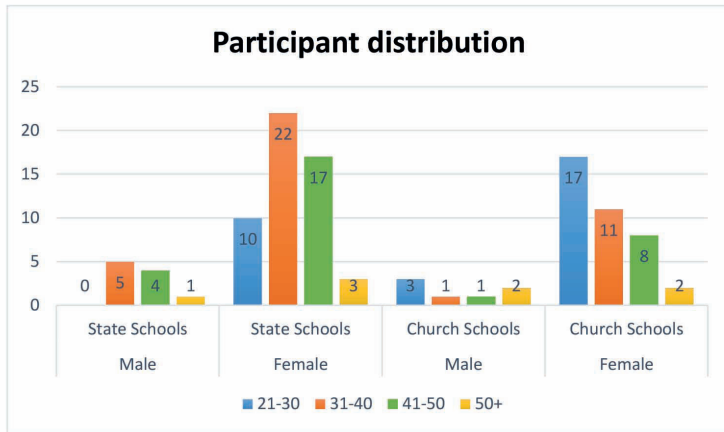


Table 1: Sample by age, sex and school sector

As shown in Table 1 above, out of the 108 respondents, 90 (83.3%) are female and 17 (15.7%) are male. One respondent chose not to indicate one's gender. The average age of the respondents is 36 to 37 years old. 63 (58.3%) respondents are employed in the state sector, whereas 45 (41.7%) are employed in church schools.

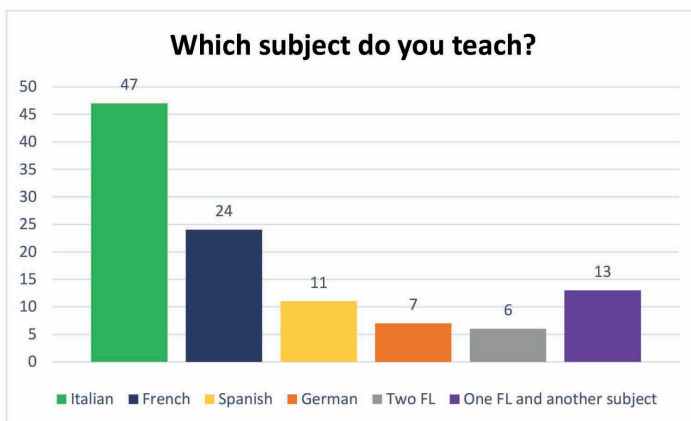


Table 2: Sample by subject taught

Research questions

The research questions addressed in this paper are threefold:

1. What are the main factors that lead to stress among teachers of foreign languages?
2. Are there stress-related differences between teachers of Italian and teachers of other foreign languages, and does the school sector in which they teach (church vs state) affect their stress levels?
3. Is stress related to levels of satisfaction within the profession and, if so, to what extent?

Quantitative analyses were carried out using the licensed software IBM SPSS Statistics 25. The overview of the results (Section 5.1) is presented using means that result from the choice of response to the TSI inventory, namely 1 = no stress; 2 = mild stress; 3 = high stress; 4 = extreme stress.

Since the data did not generate a normal distribution, relations between the variables that address the above research questions (Section 5.2) were carried out via a Mann-Whitney U test. In cases where the relationships involved more than two variables, the Chi-squared test was used (Section 5.3) in order to document any variance resulting between any one of the variables under study.

Results

In the following paragraph, each research question is considered separately and the results obtained are outlined. Several considerations presented are the result of a combination of factors, as shall be highlighted in the subsequent discussion and conclusion.

5.1 Research question (1): What are the main factors that lead to stress among teacher of foreign languages?

Table 2 below is based on the Teachers' Stress Inventory (TSI) designed by Borg and Riding (1991) as adapted for this study. Thirty indicators which are possible sources of teacher stress are listed hierarchically in descending order starting from those which are said to be the most stressful by our subjects, as per the mean included in the table. Results reveal that stress affecting teachers' work is mainly related to having too much paperwork to complete, to the perceived low status of the teaching profession, to time pressures and to the students' lack of motivation and indiscipline.


Sources of stress	N	Mean	Standard deviation	Skewness
1. Too much paperwork	108	3.14	0.767	-0.496
2. Low status of the teaching profession	108	3.14	0.901	-0.670
3. Covering the syllabus in the time available	108	3.11	0.753	-0.321
4. Not enough time for marking and lesson preparation during school hours	108	3.09	0.803	-0.391
5. Pupils who are poorly motivated or not interested	108	3.03	0.779	-0.290
6. Non-acceptance of teachers' authority	108	3.03	0.891	-0.540
7. Individual pupils who continually misbehave	108	3.01	0.942	-0.428
8. Mixed ability groups	108	3.00	0.865	-0.265
9. Inadequate salary	108	2.99	0.779	-0.225
10. Unrealistic syllabus requirements	108	2.90	0.710	-0.011
11. Demands on after school time (e.g. marking)	108	2.89	0.753	0.053
12. Responsibility for pupils' learning	108	2.87	0.876	-0.337
13. Large classes	108	2.87	0.977	-0.470
14. Pupils' impolite behaviour or cheek	108	2.84	0.909	-0.138
15. Difficult classes	108	2.81	0.912	-0.130
16. Lack of recognition for good teaching	108	2.71	0.967	-0.150
17. Noisy pupils	108	2.49	0.779	0.333
18. Lack of time spent with individual pupils	108	2.44	0.660	0.407
19. Punishing pupils (e.g. for misbehaving)	108	2.41	0.832	0.201
20. Pressure from parents	108	2.38	0.944	0.389
21. Maintaining class discipline	108	2.38	0.974	0.099
22. Pressure from head teacher and education officers	108	2.37	0.903	0.436
23. Lack of equipment and resources for teaching	108	2.32	0.841	0.381
24. Poor school organisation	108	2.25	0.939	0.307
25. Lack of participation in school decision-making	108	2.24	0.807	0.292
26. Noise and other disturbances from classes, school playground, or surroundings	108	2.05	0.911	0.664
27. Lack of support from head teacher	108	2.00	0.976	0.675
28. Attitudes and behaviours of other teachers	108	1.93	0.770	0.504
29. Lack of support from colleagues	108	1.88	0.817	0.541
30. Lack of friendly atmosphere among staff	108	1.83	0.848	0.702
1 = No stress  4 = Extreme stress				

Table 3: Sources of stress listed in descending order

When the above data was investigated on the basis of the school sector in which teachers are employed, some differences emerged in the hierarchy. While the perceived low status of the profession and exceedingly high paperwork are considered in similar terms among all teachers of foreign languages, in the state sector the indicators regarding the non-acceptance of teachers' authority and indiscipline rank more highly when compared to church schools. Means are respectively of 3.21 and 3.17 for state schools, in comparison to 2.78 for both indicators in the church sector.

5.2 Research question (2): Are there stress-related differences between teachers of Italian and teachers of other foreign languages, and does the school sector in which they teach (church vs state) affect their stress levels?

For comparability purposes, the statistical analysis related to differences in stress levels regarding teachers of Italian and teachers of other foreign languages was limited to those 89 respondents who only teach a single foreign language.

Insofar as all factors taken into consideration are concerned, no statistically significant differences are registered. This leads to the conclusion that teaching Italian or teaching another foreign language does not have a marked effect on teachers' stress levels. Having said this, two trends do emerge, albeit at a descriptive, non-statistically significant, level. The first is that a larger number of teachers of Italian relate stress to an inadequate salary (85% of the sample, vs 64% of teachers of other foreign languages), and that class size is also a larger cause for concern for the same group. Indeed, 34% of the teachers of Italian state that this causes stress while this figure decreases to 26% for the other group. A possible reason for the latter outcome is the size of the class, with classes of Italian being usually larger than those of other foreign languages.

In contrast to the above, statistically significant differences clearly emerge between respondents in the state and church sectors when a number of factors are taken into consideration, as listed below:

	State schools				Church schools				Mann-Whitney
	1	2	3	4	1	2	3	4	
Difficult classes	7.9	23.8	33.3	34.9	4.4	46.7	33.3	15.6	U = 1089.0 p = 0.032
Non-acceptance of teacher authority	3.2	19	32.7	46	8.9	24	46.7	20	U = 1032.5 p = 0.011
Pupils' impolite behaviour or cheek	3.2	27	30.2	39.7	8.9	42	35.6	13.3	U = 962.5 p = 0.003
Individual pupils who continually misbehave	4.8	22.2	23.8	49.2	6.7	33.3	35.6	24.4	U = 1069.0 p = 0.022
Noisy pupils	4.8	39.7	41.3	13.3	8.9	62.2	22.2	6.7	U = 1025.5 p = 0.008
Punishing pupils	7.9	39.7	38.1	14.3	17.8	53.3	24.4	4.4	U = 1019.0 p = 0.008

Legend: 1 = No stress; 2 = Mild stress; 3 = Much stress; 4 = Extreme stress.

Table 4: Differences in stress levels between state and church schoolteachers (values included as percentages)

5.3 Research question (3): Is stress related to levels of satisfaction within the profession and, if so, to what extent?

Apart from thirty indicators linked to various sources of stress, the TSI also included two more general questions. One was aimed at understanding the perception of how stressful it is being a teacher, whilst the other was more focused on job satisfaction. The latter was given prominence in Attard Tonna and Calleja (2018) locally, as well as in Klassen and Chiu (2010; 2011) internationally, as lack of job satisfaction is linked to stress and burnout. According to 80.5% of the participants, teaching causes much stress or even extreme stress: this means that only one out of five subjects view stress as mild or do not feel any stress.

With regards to job satisfaction, on the other hand, the results are more positive: 60.3% view their profession as rewarding and they feel satisfied with their occupation. Interesting findings are obtained through a comparative analysis of the two questions above, with the chi square test leading to a statistically significant outcome ($p = 0.017$). Results indicate that the more stressful the teaching profession is considered, the less it is viewed as rewarding and satisfying. Consequently, if levels of stress in the profession are lessened by tackling the matters that lead to it, then there will be a likelihood of the profession being perceived more positively, thereby increasing work-related fulfilment. This is illustrated in table 5 below:

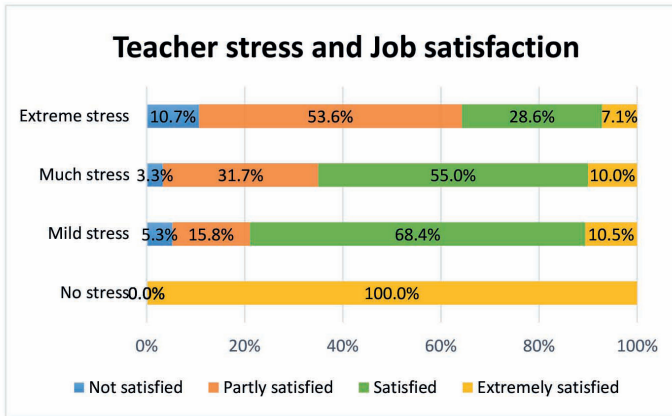


Table 5: Teacher stress and job satisfaction compared

Discussion and Conclusion

Our main findings can be summarised as follows: there are indications that stress levels among teachers of foreign languages are considerably high, and that the language that they teach does not lead to differences in the said levels. Furthermore, there are significant stress level differences between teachers in state and church schools, with the former being more negatively affected by stress than the latter, especially because of reasons related to class management. Student behaviour patterns are linked to teacher burnout, as documented in Hastings and Bham (2003), among others. Finally, stress levels are linked to job satisfaction, with those who feel fulfilled by teaching clearly being impacted less by stress related to the profession.

In the study, the number of subjects who indicate that they are affected by ‘much’ or ‘extreme’ stress is considerably higher than that reported by Borg and Riding (1991) and by Cassar and Formosa (2011). This may also be because we opted for a four-point Likert scale in this study, rather than for a five-point one. Nevertheless, there is sufficient evidence to conclude that among our participants, namely teachers of foreign languages in state and church schools, stress levels are higher than those documented in past studies. These studies were carried out with teachers of all subjects, that is they did not focus specifically on teachers of foreign languages as we did. The higher levels of stress we document is also evident in the slight, albeit noticeable, decrease of the figure of those who do not experience stress at all: 23.3% in Borg and Riding (1991) compared to 19.5% in this study.

These stress levels can also be attributed to the subjects that these teachers specialise in: foreign languages. They tally, to a certain extent, with observations made in previous studies (Pace, 2017; Caruana & Pace, 2019) that students’ motivation towards foreign language learning has declined over the years. The

reasons for this are generally attributed to the over-arching effects of English as a global language of communication, but also to the unfortunate perception that learning a foreign language may not be directly useful from a professional career's point of view. Our results are quite similar to those reported in Acheson, Taylor and Luna (2016), referred to in Section 2.

The reasons which lead to stress in foreign language teaching are related to out-of-class tasks, such as paperwork, and lack of time for marking and lesson-planning. This is analogous to results obtained in previous studies such as the ones in Borg et al. (1995) and Lui and Ramsey (2008). The stressors listed in Table 3 also find remarkable analogies when compared those listed in the EU-funded study carried out by Billehøj (2007) in which Malta participated. Time pressure, in the sense that there is a syllabus that must be covered on time, also relates to stress, and so are difficulties related to class management and students' motivation.

It may come as a surprise that the often-mentioned inadequate teachers' salaries is not among the main causes to which stress is attributed, although similar findings are also documented in Attard Tonna and Calleja (2018). On the other hand, the perception that the teaching profession has a low status has a stronger impact. This indicates that the profession requires, first and foremost, better recognition and that there is a dire need to inform the public adequately of the responsibility it entails and of the importance that it plays in society. Educating the general public about educators' professions is crucial, both to attract quality teachers as well as to retain those who have chosen teaching as a career.

This study provides some important indications of stress-levels as related to teachers of a specific area in the Maltese curriculum. It would be useful, for comparability's sake, to investigate whether similar results are also present in other areas, including among teachers of the two local context languages, English and Maltese. Results document stress related to the profession as a rather widespread phenomenon that cannot be ignored. Furthermore, it seems clear enough that if measures are taken to increase teachers' fulfilment – especially by addressing 'out-of-class' tasks such as excessive paperwork and by providing better support structures to address class management issues – the profession could stand to gain significantly. This would be especially the case since in Borg (2019), which also included a qualitative component through interviews, there is evidence that some teachers of foreign languages are resilient and that they can deal with stress despite the difficulties they face, as aptly put by a teacher in a local church school:

Although I love teaching, I feel a bit stressed because on entering class you have to deliver a lesson; you would have planned this but, often, you must abandon this plan: you realise that your students cannot reach the level you expect, or you may have planned too much ... this causes stress. Not to speak of other causes that increase stress. However, whatever happens, we put stress aside and do it day after day.

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Bio-note

Matthew Borg was awarded a Bachelor of Arts (Hons) summa cum laude in Italian by the University of Malta in 2017. He furthered his studies in the subject, by reading for a Master's in Teaching and Learning (2017/2019) at the Faculty of Education. His research focused on stress among teachers of foreign languages in local schools.

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Theory, Praxis and Puppet Plays in Cervantes and Pirandello

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Abstract

Constantly throughout his literary career, the Italian writer Luigi Pirandello (1867-1936) had always seen in Miguel de Cervantes Saavedra (1547-1616) a precursory inspiration of his own poetics. This paper delves into the complex nature of this literary influence, and particularly into the nature of the theoretical premonitions which Cervantes' *Don Quixote* has pragmatically bequeathed to Pirandello's oeuvre. After a brief glance at various testimonies on Cervantes enunciated by Pirandello himself during his lifetime, this study tackles the meaning of two emblematic passages in Pirandello's long essay *L'umorismo*, in which he traces the development of his very own poetics by linking it to Cervantes' comic element in *Don Quixote*. Finally, the paper shall embark on a textual and thematic analysis of two emblematic puppet play episodes portrayed in *Don Quixote* and in Pirandello's novel *The Late Mattia Pascal*.

Keywords: *Luigi Pirandello, Miguel de Cervantes, Don Quixote, The Late Mattia Pascal.*

Introduction

In 20th century Italian literature, *Don Quixote's* presence has been as striking and as prominent as in other Western literatures. Constantly throughout his literary career, the Italian writer and Nobel laureate Luigi Pirandello (1867-1936) had always seen in Miguel de Cervantes Saavedra's (1547-1616) *Don Quixote* (vol.1 – 1605; vol.2 – 1615) an exemplary and precursory opus of his very own poetics of *umorismo* and *il sentimento del contrario*. Cervantes not only became a sort of mythical hero of modernity to Pirandello but, in a more specific meta-literary sense, he inspired reflections on the relations between literature and the modern condition. My paper shall highlight how Pirandello's reading of Cervantes strongly intertwines with the theoretical configuration and subsequently, with the pragmatic development of his very own poetics. I am particularly interested in seeing which thematic premonitions Cervantes' *Don Quixote* has bequeathed to Luigi Pirandello's 1904 novel, *The Late Mattia Pascal*. Through these novels, Cervantes and Pirandello

enact a transformation of the genre by imbuing it with a strong dose of modernity. They bring about the consciousness of the fragmented nature and the polyphonic perspectives of reality which, at the end of the day, reveal themselves to be quite partial and relative. Cervantes and Pirandello also bring about the demise of the author's authority and voice in the text, and they contrast various forms of truth. They have truly marked the distance of the genre of the novel, as well as the literary expression of modernity, from the classical epoch. Whilst classical works had demanded in literature and theatre a certain aura of solemnity, noble thoughts and an authoritative voice in the text, the relativism of Cervantes' and Pirandello's novels prefers the comical, the grotesque, parody, the demystification of authority. The classical and mono-logical hero, who expressed himself in one type of language and gave one version of reality, is now substituted by Cervantes' and Pirandello's anti-hero and inept figure, condemned to observe himself living while doubting his own self-identity. As Romano Luperini (2005) so aptly points out, in Cervantes and Pirandello, the once classical hero now becomes a character. And I shall show that it is a destroyed puppet theatre in *Don Quixote* (or else another one with a ruptured papier-mâché ceiling in *The Late Mattia Pascal*) that will cancel out every certainty in the character and reveal a vast array of multiple possibilities that were previously hidden by literary representation.

Pirandello's views on Cervantes

A comparative study looking into Cervantes and Pirandello would reveal that their cultural backgrounds were not as diverse as one might believe them to be. They were groomed amidst the traditional values of Catholicism, towards which they adhered in the early stages of their lives, but which they rejected as they matured as writers. Zangrilli (1996) highlights that both of them were imbued with that Mediterranean culture of their native villages that could be envisaged as an osmosis of various cultures: Greek, Sicilian, Latin, Arabic, Jewish, Norman, Hispanic; hence a cultural background full of myths and fables (especially those recounting Medieval knights' chivalry and heroic deeds) which were portrayed by theatre companies, puppet masters, as well as by traditional oral culture which was passed on from one generation to the other. Their intellectual formation was based on a classical and humanistic one, which is clearly demonstrated in their opus. Pirandello had constantly shown a fervid interest in *Don Quixote*, whose image was projected since his childhood through Sicilian popular culture, particularly in the puppet theatres (De Fusco, 2015). I shall be looking in this paper into the portrayal of puppet scenes in *Don Quixote* and in *The Late Mattia Pascal* since they offer a fertile common ground of affinities between Cervantes and Pirandello. However, before looking into these texts, we have to grasp the genesis of Pirandello's interest in Cervantes.

Without neither minimising the importance of Cervantes' texts and

commentaries about him present in Pirandello's libraries, nor by detracting anything from Pirandello's many references to Cervantes during his lifetime (in articles, letters, book reviews and conferences), the most eloquent testimony to Pirandello's relationship to Cervantes is to be found in his 1908 essay *L'umorismo*. In this essay, Pirandello traces and explains the development of his very own poetics by linking it to Cervantes' comic element in *Don Quixote*. If we are seriously attempting to understand the extent of how much the humoristic temperament of Cervantes has fascinated Pirandello, we have to read the essay *L'umorismo* just as Luperini (2005) recommends that we read it, i.e. as "la coscienza pirandelliana del moderno sul piano letterario" (i.e. by seeing Pirandello's essay as a roadmap of modernity, as expressed in the history of literature; Luperini 2005, p.49). The essay contains two sections. In the first, through a multitude of examples, Pirandello traces the development of his concept of *umorismo*, starting from the philological definitions and ending in its direct application in literary works. But then, surprisingly, in a long discussion about the various texts of humoristic writers and philosophers, Pirandello gives a highlighted emphasis on the relationship between Ludovico Ariosto and Cervantes. He states that Ariosto lacks those moral tensions that are necessary for a *scrittore umorista*, because he lacks humoristic contrast. On the other hand, in Cervantes, Pirandello discovers the main elements of his *umorismo*, and thus identifies him as the first writer of this poetics in Modern literature.

The second part of the essay, which goes by the title *Essenza, caratteri e materia dell'umorismo*, is decisive to understand Pirandello's theory on humour. To Pirandello, humour is *il sentimento del contrario* (the perception of a contradictory reality) and through this perception, he defines the threshold between the comical and the humoristic. Hence, through the perception of the absurd and the ridiculous, the subject may perceive "il lato serio e doloroso della realtà" (Pirandello 2006, p.913). Pirandello affirms that humour is the only authentic form of art and through it, thanks to reasoning, the writer highlights the contradictions of reality. To explain this concept, Pirandello turns to Cervantes once again: he defines him as the only true father of his concept of *il sentimento del contrario*. Further on, we see Pirandello depicting Cervantes in prison whilst having an interview with the character of Don Quixote, in a non-dissimilar way to what Pirandello himself used to enact with his very own characters: "Il Cervantes non può consolarsi in alcun modo perché, nella carcere della Mancha, con Don Quijote – come egli stesso dice – genera *qualcuno che gli somiglia*" (Pirandello, 2006, p.930). According to Zangrilli (1996), this proves that what Jorge Luis Borges had said about this relationship was correct: Pirandello creates a precursor of his own modernity in Cervantes. Don Quixote thus becomes an emblem, according to Pirandello's *umorismo*, of the permanent conflict between reality and speculative idealism, between reality and the projections of our imagination. In this essay, Pirandello portrays in essay form what he had already described in narrative in his previous opus, *The Late Mattia Pascal*, to whose protagonist he dedicates the first edition of the essay.

The puppet theatres of Cervantes and Pirandello

Literary criticism has always seen elements of *pirandellismo* in writers that preceded Pirandello, from Antiquity right up to the Renaissance. Both cervantine as well as pirandellian criticism have noticed a whole series of thematic affinities between *Don Quixote* and Pirandello's oeuvre. Some of the most consistent ones are the following: Américo Castro's article '*Cervantes y Pirandello*' (1924); Leonardo Sciascia's chapter '*Con Cervantes*' in his monograph *Pirandello e la Sicilia* (1968); Wladimir Krysinki's concept "*la linea Cervantes-Pirandello*" in his monograph *Il paradigma inquieto* (1988), as well as other more recent studies by pirandellian scholars Franco Zangrilli (*Le sorprese dell'intertestualità: Cervantes e Pirandello*, 1996) and Carla De Fusco (*Il fascino di don Chisciotte: Unamuno e Pirandello*, 2015). The one which deserves mostly our attention is Carla De Fusco's analysis of the meta-fictional aspect of their puppet theatre scenes (De Fusco, 2015). De Fusco looks at Cervantes' and Pirandello's self-conscious and systematic use of the literary device of metafiction to draw attention to their work's status as an artefact of modernity. Cervantes' and Pirandello's metafiction poses questions about the relationship between fiction and reality, usually by using irony and self-reflection.

Like many writers who preceded him, Pirandello could not help seeing in *Don Quixote* an irreverent novel which parodies chivalric romance; in other words, a humoristic meta-novel. And when one comes to think of *The Late Mattia Pascal*, one understands the importance of Cervantes' lesson to Pirandello, especially in chapter 12, when we read about the discussion between Anselmo Paleari and Adriano Meis on the fundamental difference between classical and modern theatre. Anselmo Paleari, the landlord where Adriano Meis lives, announces that a puppet theatre company shall put up Sophocles' Greek tragedy *Electra*. However, in commenting upon this portrayal, Paleari indicates - in a comment marked by parody - that if Orestes could notice the perforation in the puppets' papier-mâché sky prop ("*lo strappo nel cielo di carta*"; Pirandello, 2005, p.467), he would transform himself into Shakespeare's Hamlet; hence, he will not remain an implacable instrument of vengeance anymore but he will become a modern character assailed by doubt:

Oreste sentirebbe ancora gl'impulsi della vendetta, vorrebbe seguirli con smaniosa passione, ma gli occhi, sul punto, gli andrebbero lì a quello strappo, donde ora ogni sorta di mali influssi penetrerebbero nella scena, e si sentirebbe cader le braccia. Oreste, insomma, diventerebbe Amleto. (Pirandello, 2005, p.467)

This reflection on the meta-theatrical nature of the automatons of *The Late Mattia Pascal* recalls one of the most complex episodes of Cervantes' novel: the encounter of Don Quixote with the puppet theatre. This episode is an icon of expired heroic fiction in which we find revealed the lustre of fiction as well as the twilight of its meaning. In this tavern scene, Don Quixote watches a puppet play managed by

Maese Pedro, who is actually the criminal Ginés de Pasamonte, currently engaged in impersonating a puppet master. The play narrates and parodies the plot taken from the Carolingian cycle of adventures pertaining to Don Galiferos, who rescued his wife Melisendra from an evil knight's captivity. When the play describes the enemy army chasing the unfortunate couple, Don Quixote springs up to defend them and destroys all the puppets and props with his sword. This episode, unlike other adventures circumscribed in one chapter, evolves in chapters 25, 26 and 27 of the second part of *Don Quixote*, which bears testimony to the relevance that Cervantes wanted to assign to it (De Fusco, 2015). In what seems like a genetic premonition to Pirandello's meta-theatre trilogy, Cervantes describes the audience that watches, comments and finally intervenes during the puppet play, climaxing with Don Quixote's unexpected invasion and destruction of the puppet theatre apparatus, as well as the final revelation of the puppet master's true identity. Cervantes gives a more ample and articulated treatment of the theme than Pirandello, in his puppet scene in *The Late Mattia Pascal*. In 1904, when Pirandello published this novel, he had still not matured as the 1921 mature meta-theatre playwright of *Six Characters in Search of an Author*, and hence he assigns to it the brevity of a note, or of an aside reflection, during the dialogue between Paleari and Meis. However, notwithstanding this difference, both narrate the end of a literary tradition, the irrevocably compromised illusion of fiction and the exilic condition of the writer (De Fusco, 2015).

In the Spanish novel, the puppet master Maese Pedro is not only the expert manipulator of stage illusion but also the owner of a monkey of miraculous skills: for two crowns, the monkey reveals the past and the present, in such a way that all travellers surround it and pose questions about their future. The monkey in fact springs onto her master's shoulders and whispers into his ears the reply, which Pedro then reveals to his stupefied audience. Even Sancho, initially reluctant to believe the soothsaying qualities of the monkey, was amazed to learn about his wife Theresa who was working with a glass of wine close-by to lighten her difficult task. All the clients of the tavern admire the soothsaying qualities of the monkey and this preparation of the audience will now allow the puppet master to commence the puppet play, with a baton in hand, which he uses to indicate and identify the puppet characters on stage in such a way as to create an epiphanic effect during the play. The play which is being put up requires indeed all the care and attention of the puppet master since it is a piece from the popular tradition of the Spanish Carolingian cycle of epic tales (De Fusco, 2015). However, the courageous puppet knights will not conclude their glorious epic because Don Quixote invades the theatrical space to defend the Christian heroes. Maese Pedro uselessly tries to quell Don Quixote's fury by telling him that the Moors are just papier-mâché puppets on a string; Quixote thinks that this is a trick since in the Land of the Giants, fiction is reality, and reality is an illusion. Hence, Don Quixote continues destroying the puppet theatre props. All the theatrical props which had created the stage illusion of reality are now destroyed; and the shattered puppets, now lying on the floor, are

deprived of that magic of chivalric fiction, just as Pirandello's sky prop is ruptured for the automaton of Orestes to stare at, in awe, because now his heroic qualities as a character are vain (De Fusco, 2015).

When Don Quixote and all the other spectators see the destroyed puppets of Charlemagne, of his knights, of Melisendra, lying on the floor, they are all astonished, and their arms drop down just like those of Pirandello's automaton of Orestes. Since to Cervantes and Pirandello, the stage fractures itself as soon as reality collides with it, theatrical illusion has now been terminated, and the fable can no longer be told or portrayed (De Fusco, 2015). This is the unavoidable fate for Cervantes' and Pirandello's characters that had stepped onto the threshold of modernity; they are perceived as incapable of contemplating chivalric virtues; they are unable to understand the ancient legends of heroes; they are capable only of covering up deceit, a role for which Pirandello designates the character of Papiano who is described as "pago del cielo di cartapesta, basso basso, che gli sta sopra" (Pirandello, 2005, p.468). This is also a role which Cervantes assigns to Maese Pedro, who praises not the heroic quality of his characters but solely their monetary and market value, since he wants Don Quixote to pay up for the damages he caused (De Fusco 2015).

Another affinity in these puppet scene episodes concerns the element of parody and meta-textuality. In Cervantes' case, the meta-text is the episode of Melisendra which was taken from the solemn epical source of the Carolingian cycle; it is parodied without even Don Quixote realizing it as he is so engrossed by the task of destroying the puppets that threaten Melisendra. In a similar way, even in *The Late Mattia Pascal*, the parody of the sublime models of Sophocles and Shakespeare is not noticed by the characters of Paleari and Adriano Meis; both are immersed in their thoughts on the philosophical implications of modernity (De Fusco, 2015).

Cervantes and Pirandello are thus narrating the crisis of narrative forms that had portrayed the values of Renaissance Humanism and those of late 19th century Naturalism, respectively. The crisis they write about also concerns the literary conventions that had regulated writing itself, i.e. the relationship between author and opus (De Fusco, 2015). Hence, in chapter 27 of *Don Quixote*, which concludes the puppet theatre trilogy, it is revealed who Maese Pedro actually was, and what sort of trick he had contrived with his monkey. In reality Maese Pedro was Gines de Pasamonte and the monkey obviously does not speak; it is only trained to leap onto the shoulder of her trainer whilst he pretends to listen to its whispers, thus faking a prophecy which in reality was only based on rumours which he had heard beforehand whilst journeying from town to town with his puppet theatre in La Mancha. The theatre thus becomes a metaphor of reality which is controlled by the devices of theatrical fiction, and characterized by the cases of mistaken/reinvented identities, just like the case of Mattia Pascal and Adriano Meis. Apart from this, Cervantes and Pirandello are not even the 'real' authors of the narration. Cervantes states that he is simply transcribing faithfully the translation of the manuscript of Cide Hamete,

a Moor who however swears as a Christian catholic that whatsoever he narrates is truthful. The ambiguity of having an Arab chronicler and the improbable justification of the translator make Cervantes, the 'Author', unreliable (De Fusco 2015). In a similar way, Pirandello is not the real author of *The Late Mattia Pascal* since he declares to have transcribed it from a manuscript belonging to Mattia Pascal himself, whose identity is suspended between the past and the present.

In this dissolution of traditional narrative forms, Cervantes and Pirandello have denounced both the crisis of an entire cultural system as well as the useless role of the intellectual who, first and foremost, cannot even claim the authenticity of his own writing. The destruction of the puppet theatre will always remain an interpretative paradigm of *Don Quixote* for pirandellian scholars, as well as an archetype of the later implosion of the space on-stage, in late 19th century bourgeois theatre, which Pirandello himself has denounced in his meta-theatre trilogy. In this sense, Pirandello reveals himself to be a very careful and precocious reader of Cervantes and of his meta-fictional pragmatics. Pirandello's poetics was lured by that uncanny image of the broken puppet theatre, relegated to uselessness and incapable of representing any contemporary poetical imagination.

Conclusion

In both writers, the decadence of literature and its system of representing reality not only compromises the identity of the author but provokes simultaneously the absence of a mature audience capable of understanding the legends of their heroes (De Fusco, 2015). This issue brings into view the sense of the 'unpresentable', as J.F. Lyotard might have intended it (Lyotard, 1992) and the incommunicable poetics of the writer who finds it difficult to reach his audience. The audience of the puppet master Maese Pedro was in fact known as the people from the braying town, and was quite popular in the neighbourhood for being very capable in imitating the braying of a donkey, and hence incapable, through their metaphoric coarseness, to understand the legends of past chivalry. They remain silent and static whilst they disappear into the narration amidst Don Quixote's destructive fury, because they have lost ages ago that sensitivity to chivalric virtues and fables; in fact, they limit themselves to being careful observers of a puppet market very ably organized by Maese Pedro himself (De Fusco, 2015). Pirandello himself, in the *Premessa* of the *The Late Mattia Pascal* describes the public library of Miragno, totally neglected by his townfolk, as a 'braying' society in the cervantine sense, a society insensitive to the lustre of culture and literature. This dismal end of literary civilisation has caused, in Pirandello's view, the crisis of identity at a subjective and an objective level, and in the *Premessa seconda (filosofica) a mo' di scusa*, Mattia Pascal, reminiscent of Giacomo Leopardi's poetics, gives to the character of Don Eligio Pellegrinotto his explanation that absolves modern Man from responsibility for this crisis (De Fusco, 2015). The blame lies with Copernicus who had ended the anthropocentrism of

the Ptolemaic system of the universe, and with it, the reassuring certainty that God had created the universe solely for mankind, who now wanders listlessly in a world completely unknown to him. In a method, typical to Pirandello's literary pragmatics, tradition is contemplated in all its complexity and then reinterpreted: hence, in the character of Mattia Pascal, one can perceive Pirandello's juxtaposition of Cervantes' and Leopardi's poetics in all their estranging and displacing suggestiveness (De Fusco, 2015).

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Bio-note

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Spectral Graph Theory – From Practice to Theory

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Abstract

Graph theory is the area of mathematics that studies networks, or graphs. It arose from the need to analyse many diverse network-like structures like road networks, molecules, the Internet, social networks and electrical networks. In spectral graph theory, which is a branch of graph theory, matrices are constructed from such graphs and analysed from the point of view of their so-called eigenvalues and eigenvectors. The first practical need for studying graph eigenvalues was in quantum chemistry in the thirties, forties and fifties, specifically to describe the Hückel molecular orbital theory for unsaturated conjugated hydrocarbons. This study led to the field which nowadays is called chemical graph theory. A few years later, during the late fifties and sixties, graph eigenvalues also proved to be important in physics, particularly in the solution of the membrane vibration problem via the discrete approximation of the membrane as a graph. This paper delves into the journey of how the practical needs of quantum chemistry and vibrating membranes compelled the creation of the more abstract spectral graph theory. Important, yet basic, mathematical results stemming from spectral graph theory shall be mentioned in this paper. Later, areas of study that make full use of these mathematical results, thus benefitting greatly from spectral graph theory, shall be described. These fields of study include the P versus NP problem in the field of computational complexity, Internet search, network centrality measures and control theory.

Keywords: *spectral graph theory, eigenvalue, eigenvector, graph.*

Introduction: Spectral Graph Theory

Graph theory is the area of mathematics that deals with networks. In its simplest form, a graph, or network, is a set of points called vertices, connected to each other by edges (Wilson, 1996). Such a graph may represent things as diverse as, but not limited to, molecules, road networks, computer networks, interconnections of a brain, electrical networks and social networks. This vast array of representations

allows graph theory to be applied in virtually all areas related to science, technology, engineering and mathematics.

Spectral graph theory is a subfield of graph theory in which a matrix is used to represent the underlying graph, then the graph is studied using the eigenvalues and eigenvectors of this matrix. (Cvetković et al., 2009). The simplest graph matrix representation is the so-called adjacency matrix \mathbf{A} , which is the $n \times n$ matrix (n being the number of vertices in the graph) whose entry in its j th row and k th column is 1 if vertices j and k are connected by an edge in the graph and is 0 otherwise. But other matrices are possible, for example the Laplacian matrix $\mathbf{L} = \mathbf{D} - \mathbf{A}$, where \mathbf{D} is the diagonal matrix of vertex degrees of the graph (by degree is meant the number of vertices that are incident to a particular vertex) and the generalized adjacency matrix $\mathbf{A} + y\mathbf{J}$, where \mathbf{J} is the matrix of all ones and y is any real number (Cvetković et al., 2009).

If, for some $n \times n$ matrix \mathbf{M} , there exists a nonzero vector \mathbf{x} (an $n \times 1$ matrix) that satisfies the following equation:

$$\mathbf{M}\mathbf{x} = \lambda\mathbf{x} \quad [1]$$

then λ is called an eigenvalue of \mathbf{M} and \mathbf{x} is called an eigenvector associated with the eigenvalue λ . The set of all the n eigenvalues obtained in this way is called the spectrum of \mathbf{M} (Horn & Johnson, 2012).

Spectral graph theory deals with discovering properties of a graph from the spectrum (and, sometimes, the eigenvectors) of some matrix representing it. Doing this may seem unnecessary and devoid of any applications at this point, but this couldn't be further from the truth.

Hückel Molecular Orbital Theory

In 1926, the Austrian Erwin Schrödinger (1926) published what would later be called the Schrödinger equation. The time-independent version of this equation is of the form

$$\hat{H}\Psi = \mathcal{E}\Psi \quad [2]$$

where Ψ is the wave function of the system modelled by the partial differential equation above, \hat{H} is the Hamiltonian operator of the system and \mathcal{E} is the energy of the system. If the Schrödinger equation is applied to a molecule and is solved, then its solutions end up describing the behaviour of the electrons in the molecule, as well as their energies (Majstorović et al., 2009). Unfortunately, solving the Schrödinger equation proved difficult.

In 1931, Erich Hückel, a German scholar, proposed the following method to approximate solutions of [2], the Schrödinger equation for unsaturated conjugated hydrocarbons. Hückel's approach (1931), nowadays called the Hückel Molecular Orbital theory (HMO) was to express Ψ as a linear combination of a finite number of suitably chosen basis functions. This transforms [2] into

$$\mathbf{H} \Psi = E \Psi \quad [3]$$

so that the Hamiltonian operator \mathbf{H} is now a finite matrix. The similarity of equations [1] and [3] is apparent.

The matrix \mathbf{H} was defined such that its diagonal entries are all equal to a constant α and any entry in the j th row and k th column is equal to a constant β if the (carbon) atoms j and k are chemically bonded and is equal to 0 otherwise. In other words, $\mathbf{H} = \alpha \mathbf{I} + \beta \mathbf{A}$, where \mathbf{I} is the identity matrix and \mathbf{A} is the adjacency matrix of the graph corresponding to the carbon-atom skeleton of the conjugated molecule. Interestingly, this relation became known only in 1956, a full 25 years after Hückel proposed his HMO theory (Majstorović et al., 2009).

This means that the energy levels of the π -electrons are $E_j = \alpha + \beta \lambda_j$ for all $j = 1, 2, \dots, n$, where λ_j is the j th eigenvalue of the adjacency matrix \mathbf{A} . The eigenvectors, in turn, were taken as discrete approximations to the molecular orbitals Ψ_1, \dots, Ψ_n . Thus, a clear association between the π -electron energy levels of the hydrocarbon, the molecular orbitals and the eigenvalues and eigenvectors of the adjacency matrix of the underlying graph has been established. The area of spectral graph theory was born.

From here, Ivan Gutman deduced the total π -electron energy as being

$$E_\pi = \alpha n + \beta (|\lambda_1| + |\lambda_2| + \dots + |\lambda_n|).$$

Because of this, he called the expression in brackets $|\lambda_1| + |\lambda_2| + \dots + |\lambda_n|$ the energy of the graph (Gutman, 1978). Researchers ignored this achievement until around the turn of this century, when suddenly the graph energy concept started to attract attention. This resulted in what Gutman himself called an 'energy deluge' of papers! (Gutman, 2017, pers. comm., 17 April).

Vibrating Membranes

Another problem that contributed to the birth of spectral graph theory was the study of vibrating membranes. It is assumed that a vibrating membrane is held fixed along its boundary, which may have any shape. A simple example of such a membrane is a drumhead, which is hit by hands or sticks to produce certain frequencies. Its displacement $F(x, y, t)$ orthogonal to the (x, y) plane at time t is given by the wave equation (Cvetković et al., 1978; Cvetković et al. 2009). When the harmonic vibrations, given by solutions of the form $F(x, y, t) = z(x, y) e^{i\omega t}$ are substituted in this wave equation, a partial differential equation of the following form is obtained:

$$\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2} + \lambda z = 0, \quad z(x, y) = 0 \text{ at boundary.}$$

Solutions to the above equations are approximated by forming a regular lattice, for example a square lattice, and only considering the z coordinates that lie on this

lattice. The lattice, of course, is a graph. The value of $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2}$ at the point (x_0, y_0) can be approximated by

$$\frac{1}{h^2} (z(x_0 + h, y_0) + z(x_0 - h, y_0) + z(x_0, y_0 + h) + z(x_0, y_0 - h) - 4z(x_0, y_0)).$$

By substituting this in the partial differential equation and summing up over all internal points z_j (points within the boundary) that neighbour the point z_i , the following equation is obtained:

$$(4 - \lambda h^2)z_i = \sum_{j \sim i} z_j.$$

Considering the subgraph of the lattice induced by the internal vertices, the above equation is just the eigenvalue equation for this graph, which are then used to obtain approximate solutions to the original partial differential equation (Cvetković et al, 2009).

This led to Mark Kac (1966) asking the question “Can we hear the shape of a drum?”. In other words, if the vibrating frequencies of a drum are heard, can the shape of the drum be reconstructed uniquely? Or are there two different drum shapes that produce the same frequencies? In spectral graph theory terms, this question asks whether one can reconstruct a graph uniquely given its spectrum. As shall be presented in the subsequent sections, the answer is, in general, no.

Back to Spectral Graph Theory

Research in spectral graph theory thus began roughly in the late fifties. In 1978, the very first monograph on spectral graph theory called *Spectra of Graphs: Theory and Application* (Cvetković, Doob & Sachs, 1978) was published. This book attempted, and largely succeeded, to serve “as a unifying collection of material in the subject” of spectral graph theory. Its bibliography contains 683 papers on different aspects of this topic, which the authors claimed to comprise most papers written in this area up to that point in time. A survey of the important mathematical results stemming from spectral graph theory, taken from this monograph and its modern follow-up *An Introduction to the Theory of Graph Spectra* (Cvetković et al., 2009), shall now be presented.

One important aspect of spectral graph theory is discovering what information of the graph can be extracted from the eigenvalues of the adjacency matrix. Early on, researchers, including the notable Frank Harary, thought that the eigenvalues characterize the graph completely, that is, no two graphs share the same eigenvalues. This was shown to be incorrect by several researchers, the earliest of whom can be traced back to 1957 (Collatz & Sinogowitz, 1957). Thus, from a set of eigenvalues, one cannot, in general, uniquely reconstruct the original graph.

Researchers thus turned their attention to what aspects of the graph can be deduced from its spectrum.

It is assumed henceforth that the eigenvalues $\lambda_1, \lambda_2, \dots, \lambda_n$ are in non-increasing order, so that λ_1 is the largest and λ_n is the smallest among the n eigenvalues. The k th spectral moment s_k is defined as the sum $\lambda_1^k + \lambda_2^k + \dots + \lambda_n^k$. A closed walk of length k in a graph is a sequence of vertices $v_1, v_2, \dots, v_k, v_1$ having $(k + 1)$ vertices where the first and last vertex are identical and every two consecutive vertices in the sequence are connected by an edge. An early result states that s_k is precisely the number of closed walks of length k in the graph (Cvetković et al., 2009). There is also the reverse result that states that if the spectral moments $s_0, s_1, s_2, \dots, s_n$ are known, without prior knowledge of the eigenvalues, then the n eigenvalues themselves can be extracted uniquely. Thus, knowledge of the spectrum of a graph is equivalent to the knowledge of the number of closed walks of length $0, 1, 2, \dots, n$ in the graph (Cvetković et al., 2009).

For any graph, the number of closed walks of length zero is n , while the number of closed walks of length one is 0. The number of closed walks of length two is equal to twice the number of edges – this tells us that the number of edges of a graph is deducible from its spectrum. The number of closed walks of length three is equal to six times the number of triangles – cycles of length three – in the graph. This implies that the number of triangles is also recognisable from the spectrum.

A graph is regular if its vertices have the same degree, that is, if each vertex has the same number of edges incident to it. Collatz and Sinogowitz (1957) proved that the largest eigenvalue λ_1 is at least equal to the average degree and at most equal to the maximum degree in the graph. This immediately implies that λ_1 is equal to the (common) degree of the graph if the graph is regular. Remarkably, this condition is also sufficient. Thus, a graph is regular exactly when $n\lambda_1 = s_2$, showing that whether a graph is regular or not is also recognisable from its spectrum (Cvetković et al., 2009).

A graph is k -colourable if it is possible to assign k colours to the vertices of the graph such that adjacent vertices have different colours. If a graph is 2-colourable, then it is said to be bipartite. Many hydrocarbons studied by chemical graph theorists are, in fact, bipartite. Whether a graph is bipartite or not is also deducible from the spectrum; indeed, a graph is bipartite if and only if $\lambda_1 = -\lambda_n$. Moreover, when this is true, the other eigenvalues would also share a similar trait; $\lambda_2 = -\lambda_{n-1}$, $\lambda_3 = -\lambda_{n-2}$, and so on (Cvetković et al. 1978). (It is known that $\lambda_1 > -\lambda_n$ except when the graph is bipartite.)

The chromatic number of a graph is the smallest possible k such that the graph is k -colourable. For example, bipartite graphs have chromatic number 2. The calculation of the chromatic number is, in general, an NP-complete problem – see the next section. However, Wilf (1986) showed that the chromatic number is at most equal to $1 + \lambda_1$, while Hoffman (1970) showed that it is at least equal to $1 -$

$\frac{\lambda_1}{\lambda_n}$. These results are striking, because even though determining the chromatic number is NP-complete, spectral graph theory provides bounds for what it can be, and clearly determining the spectrum of a graph can be performed in polynomial time.

Recent Applications of Spectral Graph Theory

Computer Science: the P versus NP problem

The P versus NP problem in computer science asks, informally, whether any problem that can be *verified* in polynomial time (NP) can also be *solved* in polynomial time (P) (Cook, 1971). This question is made relevant by quite a few problems that can be verified in polynomial time but that, so far, their solution does not seem to be possible in polynomial time. Some of these problems are also known to be NP-complete; this means that any NP problem can be transformed to an NP-complete problem in polynomial time (van Leeuwen, 1998). Examples of NP-complete problems include the games of Sudoku, Rubik’s Cube and Lemmings (Kendall et al., 2008). There are many problems related to graph theory that are also NP-complete; as mentioned earlier, finding the chromatic number of a graph is one of them. Many experts believe the answer to the P versus NP problem is “no”.

Some NP problems are not known whether they are also NP-complete. One of them is the graph isomorphism problem, which asks whether two graphs are isomorphic, or essentially the same (Schöning, 1988). There is a class of graphs called strongly regular graphs for which deducing whether two such graphs are isomorphic is particularly hard. However, spectral graph theory characterizes strongly regular graphs completely – they are the regular graphs whose spectrum contains three distinct numbers only (Shrikhande & Bhagwandas, 1965). Thus, a strongly regular graph cannot share its spectrum with another regular graph that is not strongly regular, and this provides a way of recognising that two such graphs are non-isomorphic in polynomial time. Moreover, if two graphs have different spectra, then they must clearly be non-isomorphic, irrespective of whether they are strongly regular or not.

We have already mentioned, however, that two graphs may share the same spectrum without being isomorphic. Such pairs of graphs are called *cospectral*. Sometimes, such graphs are distinguished by using a more general matrix, different from the adjacency matrix \mathbf{A} , to represent them. A popular choice is the generalized adjacency matrix $\mathbf{A} + y\mathbf{J}$ described in the introduction (Abiad & Haemers, 2012; Farrugia, 2019a). Unfortunately, some graphs are cospectral with respect to this matrix for all real numbers y (called *generalized cospectral*), even though they are not isomorphic! Indeed, the author of this paper recently

described a method to generate thousands of pairs of non-isomorphic, generalized cospectral graphs from just one pair of such graphs (Farrugia, 2019a).

Internet Search – The Google PageRank Algorithm

It is perhaps surprising that spectral graph theory is at the heart of the PageRank algorithm, which millions of people use every day to perform Google searches (Brin & Page, 1998). It assumes a directed graph on n web pages, with an arrow from web page x to web page y if x contains a link to y . The adjacency matrix \mathbf{A} is, as usual, the matrix containing an entry 1 at the x th row and y th column if x is a web page linking to web page y . Note that, for this application, it's not always the case that the reverse arrow exists. The algorithm uses matrix \mathbf{M} , equal to $\frac{1-\alpha}{n} \mathbf{J} + \alpha \mathbf{D}^{-1} \mathbf{A}$, where \mathbf{D} is the matrix where each diagonal entry contains the number of links that web page links to externally and α is some constant between 0 and 1 (the authors suggest $\alpha = 0.85$). If some web page has no external links, the relevant diagonal entry of \mathbf{D} is 1 instead of 0 (otherwise \mathbf{D}^{-1} would not exist). The spectrum of \mathbf{M} is then found and the eigenvector \mathbf{u} of the largest eigenvalue λ_1 is focused upon. The web pages displayed in the search are then ordered according to the entries of \mathbf{u} . Intuitively, each entry of \mathbf{u} represents the expectation of finding oneself at that web page, either by clicking on a random link on the current page, with probability α , or by selecting an Internet web page at random, with probability $1 - \alpha$ (Brouwer & Haemers, 2012).

Network Centrality Measures

In many networks, measuring which vertices are deemed more important than others is paramount. This is what we mean by network centrality. The Google PageRank algorithm measures the more important web pages on the Internet that correspond to the user's search query; in this sense, the PageRank algorithm can be understood as pertaining to this section as well.

There are various other ways to measure network centrality. One of them, due to Estrada (2000) calculates the number of closed walks of the graph and then combines them together by assigning a weighting to each of them, giving priority to the shortest walks, and adding them up. The vertices that score highest are deemed more important. Note that, as was mentioned earlier, the number of closed walks of any length in a graph is obtained from the knowledge of the n eigenvalues of matrix \mathbf{A} .

The Estrada index (Estrada, 2000) is a way of totalling these network centralities to give an overall score to the graph. Its initial application was in biochemistry, to quantify the degree of folding in proteins (Deng et al., 2009). Only later was the Estrada index used to measure the centrality of complex networks like metabolic, communication and social networks (Estrada, 2007). The Estrada index has also

found utility in statistical thermodynamics (Estrada & Hatano, 2007) and information theory (Carbó-Dorca, 2008), so much so that its importance is now widely accepted and used by scientists, not just mathematicians.

Another way to interpret network centrality is as clustering a large data set given as a graph. An effective way of doing this is by using the eigenvectors associated with the m smallest eigenvalues of the Laplacian matrix \mathbf{L} (or a normalised version) and producing an m -dimensional plot of points obtained from these eigenvectors, to obtain a visual clue as to which data points ‘cluster’ together (Brouwer & Haemers, 2012).

Control Theory

A control system is represented by a diagram showing how several agents are linked together, exchanging information to move from one state to another. This is akin to a graph where the agents are represented by the vertices and edges are represented by their interconnections. The controllability, or otherwise, of such a system can be investigated by considering the eigenvectors of the matrix associated with the underlying graph and applying the Popov-Belevitch-Hautus (PBH) test (Kailath, 1980). Since spectral graph theory deals with the revealing of the structure of a graph from its eigenvalues and eigenvectors, control system theory has recently received much research attention from leading graph theorists such as Cvetković (2011) and Godsil (2012). Their research has applications in the control of biological systems (Julius et al, 2008) and quantum spin networks (Christiandl et al., 2005).

Another way to check for the controllability of a system is by using Kalman’s controllability criterion – a system is controllable if and only if its controllability matrix has an inverse (Kailath, 1980). It so happens that the controllability matrix is precisely the same as the matrix containing the enumeration of walks in the underlying graph, called a walk matrix in the graph-theoretical literature. This adds to the value of using spectral graph theory to analyse the controllability of systems. The graph theory community defined a controllable graph as one that represents interconnected agents that can be controlled by an external agent that can communicate with all agents with equal sensitivity (Cvetković et al., 2011). The author of this paper has also contributed to the research of controllable graphs and has recently generalised the concept of a walk matrix to one where the starting and ending points of walks is arbitrary (Farrugia, 2019b). This allows the future study of controllability of systems whose control requirements do not necessarily start and end at the same set of vertices.

Conclusion

With this paper, the reader has gone through the history of the practical needs of what required the introduction of the theoretical subject of spectral graph theory, to the subsequent applications of this theory to other fields. Together, we have thus progressed from practice to theory, and then from theory back to practice again.

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Bio-note

Dr Alexander Farrugia was awarded a Ph.D. in Mathematics by the University of Malta in 2016. He is a senior lecturer at the University of Malta, Junior College and a part-time lecturer at the same university. His areas of expertise include algebraic and spectral graph theory applied to control theory, molecular chemistry and, more recently, to the study of cospectral graphs. His research led to him publishing several papers in prestigious journals and to being included in the editorial teams of two journals. He is also a Quora writer with a substantial following, where he writes primarily about mathematics, and occasionally contributes articles on mathematics in local newspapers including The Sunday Times.

Students' Attitudes & Motivation during A-level Chemistry Practical Work (exploring and addressing the needs to enhance the students' laboratory experience)

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Abstract

This study investigates students' attitudes and motivation during their practical work which forms an integral part of their A-level chemistry curriculum. It analyses the factors which determine the student's engagement in learning chemistry through laboratory activities and explores students' expectations to enhance their laboratory experience at this level of education.

The research involved the design and administration of an anonymous survey to a cohort of students studying A-level chemistry in 6 different Maltese post-secondary educational institutions. The respondents represented a good cross-section of students currently preparing for the A-level chemistry exam in Malta and Gozo.

Analysis of the survey confirmed evidence from literature sources suggesting that students in general found their laboratory experience as strongly motivating. Students' attitudes were found to be positively influenced by factors such as teacher support, well-equipped laboratories and the chance to work more regularly and independently in the laboratory. On the other hand, students expressed concern on having to deal with repetitive tasks, a vast syllabus, examination-related pressures and an unfair method of assessment. They suggested that the laboratory programme needs to be revamped to address their concerns by consolidating the link between theory and practice, allowing more space for teacher-student interaction and student collaboration, and revising the assessment criteria for the practical exam.

Findings of this study confirm that Maltese sixth form students share similar attitudes and motivations to their counterparts in other parts of the world.

Educators and other stakeholders are therefore urged to heed students' voices and considerations prior to deciding about any changes in policy-making and curriculum development aimed at enhancing the student's learning experience in the subject.

Keywords: *A-level Chemistry, Chemistry Laboratory, Chemistry Practical Work, Student Laboratory Experience.*

Introduction

Maltese students studying chemistry at an advanced level usually prepare for the local MATSEC examination, although they may opt to sit for an equivalent A-level exam set by foreign boards. The local A-level chemistry exam has 3 components, 2 written papers covering the bulk of the theory and an open-book practical paper which tests a number of students' skills and knowledge in a laboratory setting. The practical exam carries a weighting of 20% of the final score and although not being considered as failing, it plays a determining factor in the overall performance and ultimate grade attained by the candidate.

My rather long first-hand experience of working in a teaching chemistry laboratory shows that students manifest mixed feelings and are somewhat critical about their participation in chemistry practical sessions. Their attitudes and motivation may not always be conducive to exploiting in full the different learning opportunities that a laboratory provides to chemistry students at post-16.

Brief Literature Review

Research suggests that students' perceptions and behaviours in the school laboratory depend on a number of factors including teachers' expectations, methods of assessment and resources available (Hofstein et al., 2005).

Separate studies carried out with Canadian and Australian students found that half of them perceived it as a way of 'doing science' while the other half considered it as mostly focussed on 'learning science'. The studies found a number of students who were primarily concerned with completing tasks, getting correct results and completing the report, rather than thinking about the purpose of the laboratory activity itself (Hodson, 2005).

Another study in Israel found that an inquiry-type laboratory experience which was more 'student-oriented' than other traditional settings, proved to be highly stimulating for participating students. The reasons given by students involved in this study included the opportunity provided to develop scientific skills and be in control of their own learning, standing a better chance to learn through mistakes, sharing ideas and cooperating with other students, having the teacher's support and encouragement and enjoying a challenging laboratory learning experience (Hofstein et al., 2005).

Extensive literature in the area of science education, points to the fact that the school laboratory plays a crucial role in the shaping and improvement of students' attitudes and motivation to learn science (Hofstein & Manlok-Naaman, 2011).

Research Question

Although much has been written on the educators' views on practical work in the teaching of science, it would be interesting to ask students, with at least a four-year background of chemistry, to give their views on their expectations and motivations during their A-level chemistry practical experience.

Hence, the overarching research question of this study is rather simple and straightforward.

“Does practical work motivate students to learn chemistry at A-level?”

In order to answer this question, the researcher seeks to address also a number of related sub-questions:

- What are the main aspects which motivate students during their chemistry practical sessions?
- What are the students' concerns of the current laboratory programme provided by their school / college?
- What can be done to improve their learning experience in the lab and make it more appealing and relevant to students studying the subject at A-level?

Methodology

The method chosen to collect data was a self-administered questionnaire converted to an anonymous educational survey. This method was preferred in order to avoid any intervention from the teacher-researcher which could inevitably lead to interviewer bias and contribute significantly to the total survey error. This method also secures privacy and anonymity from each respondent (Je Jong, 2016).

The survey was designed to gather substantial data from chemistry students, to give an insight to the researcher on the participants' views on various aspects of their experience in both secondary and post-secondary school laboratories. It was intended to be completed within 20 minutes.

The survey was created in a student-friendly way using Microsoft Forms software and was disseminated online, so that potential participants could easily access it directly and complete it anywhere at their own leisure, over summer holidays, even using their own hand-held gadgets.

The survey, which was only eligible to post-16 students studying A-level chemistry was divided into 3 sections:

- **Section A** involved questions seeking background information about the participants;
- **Section B** included questions regarding the students' experience in the secondary school laboratory;
- **Section C** asked students to reflect on their experience (partial or complete) in the A-level chemistry lab. It included questions on activities carried out in the lab and provided a space where respondents could voice their opinion on how to make chemistry practicals more appealing and a more effective learning experience to all students concerned.

The survey consisted of a set of 51 items, including multiple choice questions, Likert-scale responses, and a number of open-ended questions. The survey was validated by academic peers and trialled online prior to being sent for approval, authorisation and dissemination. The study was fully endorsed by the University Research Ethics Committee, and by the relevant educational authorities, schools and colleges who accepted to participate in this research investigation.

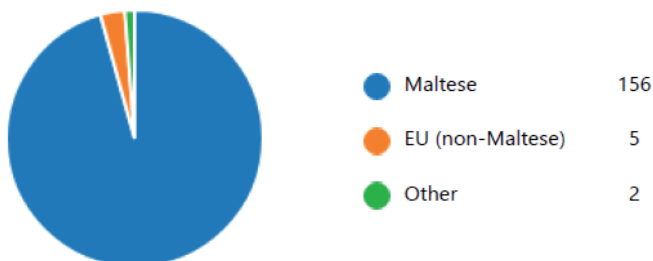
The survey weblink was eventually distributed by the colleges to their A-level chemistry students through an e-mail which included also an information letter by the researcher to all participants. All data was collected over a 20-day period, from 19th July to 7th August 2019.

Context and Participants

There were six local post-secondary institutions who accepted to participate in the study. These consisted in 3 state and 3 non-state sixth forms, 5 based in Malta and 1 in Gozo. These sixth forms represented the bulk of chemistry students (771) who were studying A-level chemistry during academic year 2018-19. In fact, this number compares well with the total number of candidates who sat for A-level chemistry in the last 2 main sessions which amounted to 888 (MATSEC, 2018; 2019).

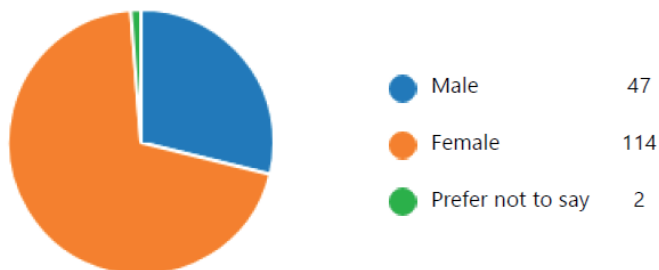
The total number of survey respondents by 7th August was 163, representing a reasonable response rate of 21%. The majority of respondents (96%) were Maltese with the rest being partly from EU countries (3%) and partly from non-EU regions (1%), as shown in figure 1.

Figure 1: Nationality of Participants (N=163)



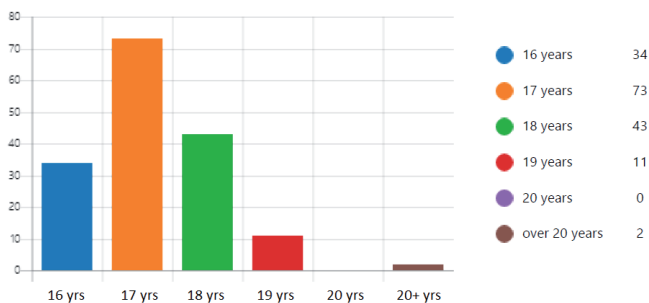
The male to female ratio of participants was approximately 3:7 (or 29% males, 70% females) as shown in figure 2.

Figure 2: Gender of Participants (N=163)



Respondents were predominantly within the 16-18 years age bracket (92%) at the time of the survey with the rest (8%) claiming to be over 18 years of age (refer to figure 3).

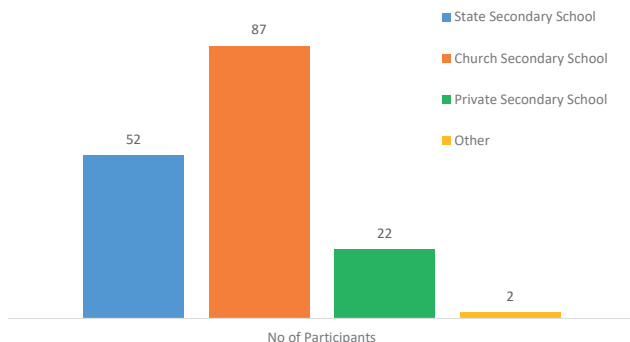
Figure 3: Age of Participants (N=163)



Participants represented a good cross-section of the Maltese society as they resided in 43 different areas, 39 localities in Malta and 4 in Gozo.

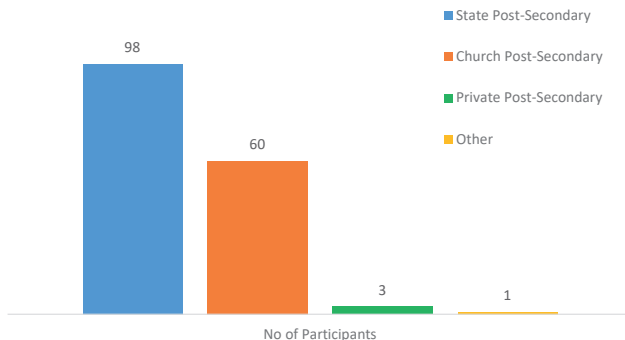
More than half of the chemistry survey participants (54%) received their secondary education in a Church school, with about one third (32%) having attended state secondary school and the rest (14%) having received similar education in an independent school (refer to figure 4 hereunder).

Figure 4: Secondary Schools attended by Participants (N=163)



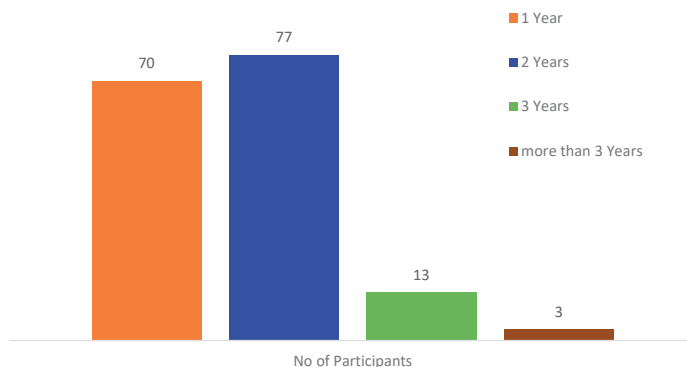
On the other hand, the number of participants who attended state sixth forms (61%) was significantly higher those following same education in Church sixth forms (37%), with the remaining participants (2%) originating from an independent sixth form college, as illustrated in figure 5.

Figure 5: Sixth Forms attended by Participants (N=163)



Almost half of the respondents (47%) had completed their 2 years of A-level chemistry studies at the time of the survey. This was only slightly higher than number of participants who were still half way through their course (43%). There was also a minority of students (10%) who extended their A-level chemistry studies beyond 2 years. This means that the survey responses represented a good mix of participants representing students at the end of their first and second years of their course of studies, as shown in figure 6.

Figure 6: Time Spent Studying A-level Chemistry (N=163)



Virtually all participants studied Biology (95%) as their second A-level subject, with Physics being the next most popular choice (4%), followed by Pure Maths.

Respondents were almost equally divided on their intentions to continue studying chemistry, 51% agreeing and 49% disagreeing. The main reasons why some participants wished to continue studying chemistry at tertiary level included:

- pursuing a career in medicine (chemistry being a pre-requisite for the course);
- following other courses requiring chemistry;
- pursuing a chemistry-related career.

Participants who were inclined to stop studying chemistry cited various reasons such as:

- interest in other courses which do not require chemistry;
- the subject was too hard and vast;
- interest to follow careers unrelated to chemistry;
- decreasing interest in chemistry;
- stronger interest in biology and other subjects;
- lack of career opportunities related to chemistry.

When asked about their immediate future plans upon finishing post-secondary education, the majority of participants (92%) expressed their interest in furthering their studies at the University of Malta, others (6%) showed preference in joining a different educational institution, while very few (2%) opted to take a gap year.

The university course which generated most interest among participants was that in medicine and surgery (49%). Other courses that appealed to participants were those related to the pure sciences (12%), pharmacy and pharmaceutical technology (12%), dentistry (6%), applied biomedical science (5%), medical biochemistry (5%) and veterinary medicine (3%). Very few survey participants showed interest in humanities courses (3%) while the rest were still undecided.

The Secondary School Laboratory Experience

The following represents a brief summary of the outcome of the section of the survey dealing with students' experience in their secondary school chemistry laboratory.

The three aspects that participants liked most about their secondary school experience was:

- serving as a bridge between theory and practice;
- giving them the chance to learn by a hands-on approach;
- providing the opportunity to work independently.

The survey showed also that the following were the students' main concerns at this level were:

- enjoying limited laboratory practice;
- problems related with health and safety;
- issues relating with the teaching style.

The majority of participants expressed their overall satisfaction with their secondary school laboratory experience, as shown in figure 7.

Figure 7: Level of Satisfaction with Secondary School Laboratory Experience (N=158)



Participants attributed their positive attitudes to reasons such as:

- the use of well-equipped laboratory facilities;
- clear explanations and professional guidance by the teachers;
- good organisation of practical sessions.

Participants who had a less positive laboratory experience, complained of a number of shortcomings such as:

- inadequate laboratory facilities;
- frequent demonstrations and group work;
- issues related with the method of teaching.

Some argued that experiments were not regular, not always well-organised and below their expectations. Other negative issues mentioned were the rushed syllabus, time limitations and lack of student feedback. Some respondents also declared they never had any formal practical sessions at all at secondary level.

The Sixth Form Laboratory Experience

The survey analysed the students' laboratory experience through a series of questions aimed at eliciting the students' views on several aspects of their practicals, what affected their attitudes and suggestions to increase their overall interest and motivation in lab work.

The survey found that while most students were able to understand written and verbal instructions from the tutor, only about half of them demonstrated full understanding of the theory involved. The analysis showed that one of the main issues in understanding theory / calculations supporting practical sessions was that these might not have been previously covered in class.

Results show that students generally worked in very safe laboratory conditions. In fact, responses showed that:

- an overwhelming majority of students always felt safe working in the lab, and well prepared on risks and hazards linked with the use of equipment and chemical reagents;
- participants were always aware of safety precautions required for every chemical practical session;
- students were also well-informed of methods of disposal of broken glassware and chemical waste.

The survey participants underlined their motivation during chemistry practical sessions and most of them (62%) usually looked forward for the next practical. One of the main student motivations in chemistry practicals remains the A-level exam. In fact, most of the participants thought that the practical sessions were solely meant to train students for exams (42%). Fewer students recognised that there were other motivating factors beyond the exam (28%) while a significant number (31%) were undecided.

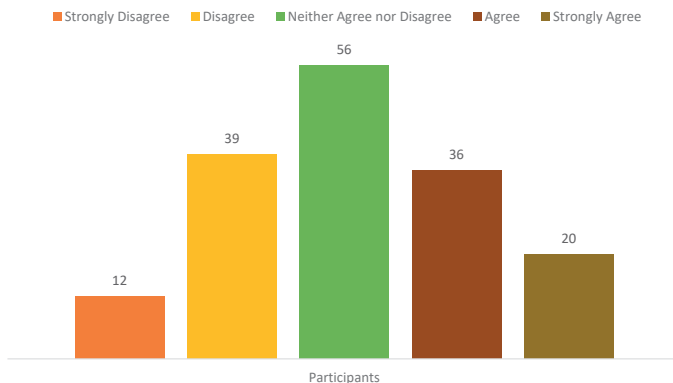
The survey analysed also the aspect of time during the practical and found that:

- three fourths of students managed their time well on a regular basis;
- most students also succeeded to complete writing their laboratory report regularly by the end of the practical;
- students also generally found enough time to clean and re-organise their workstation by the end of each session.

The analysis also showed that participants generally received sufficient attention and support by their tutor during practicals, with more than two thirds (69%) being satisfied with such help.

One interesting finding of this survey was that respondents who felt that the laboratory experience was crucial in learning chemistry was only marginally higher than those who thought otherwise (refer to figure 8).

Figure 8: Won't Choose Chemistry without a Laboratory Experience (N=163)



However, survey participants were overwhelmingly satisfied with their laboratory experience, with only a minority of participants (3%) showing contrastingly negative attitudes. Evidence suggests that level of student satisfaction in laboratory practice was considerably higher than in their earlier experience at secondary level, as shown in figure 9.

Figure 9: Level of Satisfaction with Sixth Form Chemistry Laboratory Programme (N=163)



The main reasons given by students to explain their positive attitudes towards the A-level laboratory experience were:

- greater teacher support;
- better laboratory facilities;
- greater sense of ownership and empowerment.

There were several variables which rendered the students' lab experience less satisfactory than their expectations. Negative attitudes originated from factors such as:

- issues related to teaching style;
- the occurrence of repetitive work;
- time constraints.

Analysis showed that the aspects of the A-level laboratory experience which generated most positive attitudes among students included:

- investigating unknown substances (qualitative analysis);
- performing titrations (volumetric analysis);
- applying theory to practice by using always an individual hands-on approach.

Students' attitudes were also influenced positively by the actual visualisation of concepts learnt in theory lessons, discussion of results with classmates, the occasional chance to work in teams, the type of lab report required and the teacher-student interaction.

Titrations and qualitative analysis featured again as the most disliked laboratory activities (in reverse order) for another section of participants, but for different reasons. In fact, the aspects that clearly affected most negatively the students' attitudes towards laboratory work were:

- titrations (volumetric analysis);
- qualitative analysis;
- problems related with time management.

Other tasks and aspects of their A-level laboratory experience which students disliked involved repetition, mathematical calculations, teachers' demonstrations and practicals involving synthesis or analysis of organic unknowns.

Students' Viewpoint to Improve the Laboratory Experience

The survey also gave the chance to the students to have their say on what improvements they would like to see in order to make the laboratory experience more student-friendly and a more effective learning activity.

Reduce Content, Intensity & Repetition

Participants suggested that the syllabus content for the practical component should be reduced to allow more time to think more critically and re-visit parts of the experimental procedures, if necessary.

One common idea was to reduce titrations which involves substantial repetitive techniques. Another idea was to shift emphasis from 'procedure following' to 'problem-solving' tasks.

Participants argued that even the number of unknown substances to be investigated during qualitative analysis can be reduced to a defined set, making it reasonably less difficult and complicated to arrive at correct identifications, whilst limiting also the load of examinable tests in this area of practical work.

Non-examinable Material & Outreach Activities

Students thought also that practical sessions need not be always examination-oriented as this puts extra stress on students in the lab, rendering the sessions less appealing. They suggested the design of practicals to introduce modern concepts and real-life applications of chemistry. Others came up with the idea of setting up outreach activities such as visits to specialised laboratories. They explained how this dimension of practicals would expose students to other laboratory settings, introducing them to new analytical techniques including instrumental analysis.

Stronger Link between Theory and Practice

Survey participants also agreed that it was time to update practicals radically to reinforce the link between theory with laboratory activity. This could be done in a number of ways including better use of demonstrations and visual aids.

They also proposed exposure to a greater variety of experiments and hands-on activities including other techniques encountered in the syllabus. Students also believed that experiments should touch on more areas of the A-level curriculum, enabling theory to be more relevant and easier to understand and remember.

Increased Student-teacher Interaction

Students also wanted an increased teacher involvement during the practical, with greater emphasis on explanation, guidance and individual attention in all tasks including working calculations and writing chemical equations. Whenever tested under examination conditions, students also expected a stronger feedback from the teacher which they consider as crucial in their preparation for the exam.

More Student Collaboration

One finding of the survey pointed towards the benefits gained by students when given the space to cooperate and collaborate with each other during the chemistry practical sessions. Participants felt that exercises which encouraged teamwork would allow them to share their ideas and knowledge, thereby allowing them to learn from each other's experience.

Revise Methods of Assessment

One concern shared by most of the participants was the way volumetric analysis was being assessed during practical exams. They suggested that there should be less emphasis on accuracy and an increased evaluation of other skills employed.

The survey also showed that some students preferred to have practical examination replaced in part or completely by coursework which would reflect the student's participation and aptitude throughout the entire two-year laboratory experience. They thought that this system would provide a fairer way of judging their skills and knowledge, based on continuous formative assessment.

Improve the Laboratory Environment

Some participants felt that their experience could be enhanced further if their school laboratory facilities were modernised and upgraded accordingly. Participants thought also that working in small groups in well-equipped labs would be more conducive to a less stressful and more motivating learning environment.

Radical Ideas

The survey found also a cluster of radical ideas such as the suggestion to spread the content of the current curriculum over a period of 3 years to reduce stress and allow more space for enjoyable learning activities including practical sessions.

One drastic idea was that of removing completely the practical component of chemistry in the exam and replace it with a paper involving tasks in applied chemistry or data analysis. Others thought that there should be no teacher demonstrations at all during the practical sessions as these tended to be disruptive and would distract students' from focussing on their main laboratory assignments.

Conclusion

This paper aimed at investigating sixth form students' views on their laboratory experience at school, which formed part of their A-level chemistry curriculum, and explored whether it motivates them sufficiently to learn the subject at this level of education.

The analysis clearly confirmed that students found their chemistry laboratory experience even more motivating than the one at secondary level. Reasons include; a greater support and guidance from experienced qualified tutors, the use of well-equipped teaching laboratories and the chance to learn more independently using individual hands-on activities. Students' attitudes were also affected positively by other factors such as being exposed to increasingly challenging laboratory activities, being given the chance to carry out so many different investigations on a regular basis and the increased chance to share and discuss results with teacher and other colleagues.

While younger chemistry students were mostly concerned with a lower exposure to direct laboratory work, safety issues, problems related with teaching and some learning difficulties, A-level students had to deal with a different set of concerns related to their more regular laboratory work. Such issues include the; occurrence of repetitive laboratory activities, the challenges related with frequent exercises in qualitative and volumetric analysis and the examination-related pressures such as time management during the practical and the way the practical component was assessed by examiners.

The students were quite clear in their message addressed to their educators and curriculum developers with regards to their laboratory experience. They feel the need to have a revamped laboratory programme allowing less content and more thinking time, less repetitive activities, new non-examinable techniques, better alignment of chemistry theory and practice, access to external chemistry laboratory settings, increased teacher involvement and student collaboration in the lab, and revised methods of assessment. Some students also wanted to have an improved physical environment allowing students to exploit better this very effective way of learning the subject.

The findings of this study are strikingly similar to those reported by other researchers in science education and confirms that Maltese sixth form students showed the same attitudes and motivation towards the practical aspect of chemistry education as their counterparts in other parts of the world. It is therefore high time that we as educators, and other stakeholders, listen to these students' voices and consider them seriously in future decisions in policy making and curriculum development in a bid to address their educational needs in a more holistic and enjoyable way.

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Bio-note

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Parents Know Best – An Examination of Parent Perceptions and Subsequent Proposals for a More Efficient Bilingual Education Experience in the Primary Years Cycle

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Abstract

In the light of Mayo's definition of 'praxis' (Mayo, 2018) where it is posited that this involves a critical evaluation of a concept through the adoption of impartiality and consequently seeks to bring about change as necessary, this paper evaluates the results of a large scale quantitative survey with 1318 parents whose children attended Grade V - the penultimate class in the primary years' educational cycle. The paper examines these respondents' perceptions on current Maltese and English language practices in their children's classrooms and presents what parents perceive as possible solutions towards an improvement in the quality of bilingual education experience for young learners.

Keywords: *Primary Years Cycle, Maltese, English, language proficiency, bilingual education.*

Introduction

This paper presents the results of a large-scale quantitative survey conducted amongst 1316 parents whose children were attending Grade 5 primary school at the time. This exercise was undertaken in order to gauge whether parents were generally satisfied with the progress their children had made in terms of proficiency in the two official Maltese languages: Maltese and English, and if they felt that proficiency or progress was not what it should be, parents were also asked what could be done in order to improve the status quo. Obtaining insight from parent respondents was necessary in order to have a complete picture that would then complement data obtained from another large-scale quantitative study conducted over a four year period with 987 Grade 5 primary school children as well as a third qualitative study conducted with Grade 5 primary school teachers. Hence parents were asked a series of questions through a questionnaire sent home for them to complete and then return to the researcher. Primarily parents were asked how satisfied they were with

their children’s spoken and written Maltese and English proficiency; whether they thought their children would be age-appropriate bilinguals towards the end of the primary years’ cycle, whilst being invited to contribute any suggestions towards improving the primary education bilingual experience.

Parent satisfaction with Spoken Maltese Proficiency

A total of 686 parents in State schools claim to be either ‘very satisfied’ or ‘satisfied’ with their children’s spoken Maltese proficiency. Considering the fact that 745 State school parents participated in the study, this translates into a percentage of 92% State school parents who are the most satisfied with their children’s proficiency levels of spoken Maltese. Yet another high percentage of 88.7% of Church school parents also declared themselves to be satisfied with their children’s spoken Maltese progress, however the same cannot be said of Private school parents, where only 52.9% described themselves as being either ‘satisfied’ or ‘very satisfied.’ A common factor across the three school types is the fact that most respondents (46.4% from State schools, 48.8% from Church schools and 39.1% from Private schools) only go as far as claiming themselves to be rather ‘satisfied’ with their children’s spoken Maltese – a surprising fact, considering that the Maltese language is the L1 for the majority.

Table 1.1 Parent Satisfaction with their children’s Spoken Maltese Proficiency

	School Type			Total
	State	Church	Private	
Very Satisfied	340	193	12	545
	45.6%	39.9%	13.8%	41.4%
Satisfied	346	236	34	616
	46.4%	48.8%	39.1%	46.8%
Dissatisfied	50	44	29	123
	6.7%	9.1%	33.3%	9.3%
Very Dissatisfied	9	11	12	32
	1.2%	2.3%	13.8%	2.4%
Total	745	484	87	1316
	100%	100%	100%	100%

$$\chi^2(6) = 130.98, p=0.000$$

As shown in the next table, Table 1.2, percentages dwindle somewhat (when compared with those obtained for spoken Maltese) when parents were asked to

gauge their satisfaction with their children’s spoken English. In this instance, the parents who rated themselves as being ‘very satisfied’ with their children’s spoken English goes down to 37.8%, whilst a little less than half of the sample (49.1%) stated that they were ‘satisfied.’ The percentage of those parents who recorded their dissatisfaction with English oracy rose to 13.1% (11.1% + 2%).

Table 1.2 Parent satisfaction with their children’s Spoken English proficiency

	School Type			Total
	State	Church	Private	
Very Satisfied	249	193	12	545
	45.6%	39.9%	13.8%	41.4%
Satisfied	346	236	34	616
	46.4%	48.8%	39.1%	46.8%
Dissatisfied	50	44	29	123
	6.7%	9.1%	33.3%	9.3%
Very Dissatisfied	9	11	12	32
	1.2%	2.3%	13.8%	2.4%
Total	745	484	87	1316
	100%	100%	100%	100%

$$\chi^2(6) = 58.08, p=0.000$$

The highest percentage of those parents claiming to be ‘very satisfied’ with their children’s spoken English are those parents whose children attend Private schools. Contrastingly, percentages featuring this response are lowest (33.5%) in State schools, with a slightly higher percentage of 39.9% of Church school parents, standing in middle of the spectrum.

The constant exposure to English oracy in the Private school domain, coupled by the fact that it is also the language mostly used at home, makes this a win-win situation for Private school children and their parents. Nonetheless, despite all this, there are still 6.9% Private school parents who are not pleased with their children’s spoken English progress. While it seems to be evident that there is certainly no lack of exposure to English in Private schools, the fact remains that those parents who cannot or do not make use of English within the home domain, are going to witness their own children struggle when compared with their peers who hail from a predominantly, English-speaking background.

When compared with Private schools, the percentage of those Church school parents claiming to be dissatisfied is quite similar in both schools (6.9% in Private schools and 7% in Church schools); however dissatisfaction is the highest in State schools, with 17.8% clearly showing that parents are less than happy with their children’s progress, towards what is mostly the end of the Primary Years Cycle.

Table 1.3 Parent satisfaction with their children's Written Maltese Proficiency

	School Type			Total
	State	Church	Private	
Very Satisfied	142	61	6	211
	19.1%	12.6%	9.2%	16.1%
Satisfied	446	287	32	765
	60%	59.45%	36.8%	58.3%
Dissatisfied	134	118	32	284
	18%	24.4%	36.8%	21.6%
Very Dissatisfied	21	17	15	53
	2.8%	3.5%	17.2%	4%
Total	743	483	87	1313
	100%	100%	100%	100%

$$\chi^2(6) = 73.81, p=0.000$$

Out of a total sample of 1313 respondents (as three respondents did not answer this question), only 16.1% claimed to be 'very satisfied', while a further 58.3% described themselves as being 'satisfied.' It would mean that 74.4% of all parents are relatively pleased with their children's progress, whilst 25.6% (21.6% + 4%) of the total sample, have voiced their dissatisfaction. Parent dissatisfaction with written Maltese is generally lowest in State schools (20.8%) and highest in Private schools (54% - from the 36.8% + 17.2%), with Church schools parents standing between these two extremities, having 27.9% reporting dissatisfaction with the written aspect of Maltese.

Table 1.4 Parent Satisfaction with their children's Written English Proficiency

	School Type			Total
	State	Church	Private	
Very Satisfied	180	133	40	353
	24.2%	27.5%	46%	26.8%
Satisfied	426	301	41	768
	57.2%	62.2%	47.1%	58.4%
Dissatisfied	120	47	6	173
	16.1%	9.7%	6.9%	13.1%
Very Dissatisfied	19	3	0	22
	2.6%	0.6%	0%	1.7%
Total	745	484	87	1316
	100%	100%	100%	100%

$$\chi^2(6) = 37.21, p=0.000$$

Yet again, when asked about satisfaction with written English proficiency, it transpires that only 26.8% respondents from the total sample of 1316 respondents reported feeling ‘very satisfied’ with their children’s written English proficiency. Most respondents (58.4%) reported being just ‘satisfied’, whilst a total of 14.8% proved to be dissatisfied with the command of written English. Church school parents rank second in terms of satisfaction with their children’s written English skills with 89.7% (27.5% + 62.2%) reporting this. Out of the three school types, parent satisfaction with written English is relatively the ‘lowest’ in State schools with 81.4% claiming to be ‘satisfied.’

A comparative analysis of the data for both spoken and written Maltese and English as presented in Table 1.5 allows for a comparative analysis for parent satisfaction with both the oral and written aspects for both languages

Table 1.5 Comparative analysis – parent satisfaction with oral and written aspects for both Maltese and English

	Spoken Maltese	Written Maltese	Spoken English	Written English
Very Satisfied	41.4%	16.1%	37.8%	26.8%
Satisfied	46.8%	58.3%	49.1%	58.4%
Dissatisfied	9.3%	21.6%	11.1%	13.1%
Very Dissatisfied	2.4%	4%	2%	1.7%

Satisfaction with written proficiency in both languages is perceivably weaker when compared with spoken proficiency in both languages according to data provided by parents in this study, therefore validating the hypothesis in this respect. As is evident in Table 1.5, whereas 41.4% are very satisfied with spoken Maltese, only 16.1% are ‘very satisfied’ with written Maltese. The same applies for English where more respondents (37.8%) are ‘very satisfied’ whilst only 26.8% are ‘very satisfied’ with written English. Therefore parents’ satisfaction with written skills is far lower than that for spoken skills.

Whether parents think that their children are going to be fluent in Maltese and English by the end of the Primary Years’ Cycle

The low p value presented in Table 1.6, proves the presence of the alternative hypothesis, signifying the relevance of the two categorical variables being analysed. Parents were asked to state whether they thought that the goal of NMC (1999) and the NCF (2012), which identified bilingualism at the end of the Primary Years Cycle as the optimum ideal, could actually be reached by their children. Despite the ratings given initially by parents, at the end of the day, only half of the total sample of 1313

respondents who answered this question (since there were three respondents who did not indicate any answer) believed that their children were going to be the age-appropriate bilinguals that the Maltese educational system aims for them to be.

The differences in terms of the language exposure being received by the respondents' children, are more apparent in the variety of responses acquired from Table 1.6. Twenty point four percent (20.4%) of the respondents (a total of 268 respondents) said their children were going to be more fluent in Maltese, whilst almost just as many, 18.5% (a total of 243 respondents) have been described by their parents as being more likely to be fluent in English. Four point six percent (4.6%) do not know which language their children are going to be more fluent in.

Table 1.6 Whether parents believe that their children will be bilingual by the end of the Primary School years by Type of School

	School Type			Total
	State	Church	Private	
Yes	358	273	25	656
	48.1%	56.6%	28.7%	50%
No	60	20	5	85
	8.1%	4.1%	5.7%	6.5%
More fluent in Maltese	198	70	0	268
	26.6%	14.5%	0%	20.4%
More fluent in English	82	106	55	243
	11%	22%	63.2%	18.5%
	46	13	2	61
Don't know	6.2%	2.7%	2.3%	4.6%
	744	482	87	1313
Total	100%	100%	100%	100%

$$\chi^2(8) = 188.04, p=0.000$$

It is only Church school parents who believe that their children do stand a chance of reaching the ideal stage where they are fluent in both languages by the end of the Primary Years Cycle. This was the opinion as expressed by more than half the respondents (56.6%) whose children attended Church schools.

Less than half of the State school parents (48.1%) believe that their children will end up being fluent in both languages. As many as 26.6% of the respondents stated that their children are going to be more fluent in Maltese and this would be no surprise given the dominance of Maltese language exposure both within the home as well as the school domain. A further 11% said their children are going to be more fluent in English, whilst 6.2% of the State school respondents did not indicate an answer other than a 'Don't know.'

Towards improving Maltese language proficiency – parents’ perspectives

Respondents were asked what could be done to improve the level of Maltese teaching from their point of view and were able to select more than one answer from a list of pre-coded responses. Being a multiple-response type of question, the total number of answers selected by respondents add up to 1875 individual responses.

Table 1.7 shows that the response most-commonly selected by parents 26.1% of the time was the move to have ‘specialised teachers’ teaching in schools, so that the level of spoken and written Maltese used by teachers when delivering classroom content, would be a reflection of their own area of specialisation thus enhancing the quality of teaching.

Table 1.7: Parents’ suggestions towards improving Maltese language proficiency in schools by Type of School

		Type of School			Total
		State	Church	Private	
Specialised teachers in Maltese	Count	302	165	23	490
	% within school types	29.3%	23.8%	15.1%	26.1%
	% across school types	61.6%	33.7%	4.7%	100%
Earlier exposure to Maltese	Count	130	108	33	271
	% within school types	12.6%	15.6%	21.7%	14.5%
	% across school types	48%	39.9%	12.2%	100%
More time for spoken Maltese in class	Count	225	168	52	445
	% within school types	21.9%	24.2%	34.2%	23.7%
	% across school types	50.6%	37.8%	11.7%	100%
More use of Maltese in the curriculum	Count	158	128	27	313
	% within school types	15.4%	18.4%	17.8%	16.7%
	% across school types	50.5%	40.9%	8.6%	100%
Use only Maltese in the early years	Count	50	19	2	71
	% within school types	4.9%	2.7%	1.3%	3.8%
	% across school types	70.4%	26.8%	2.8%	100%
Use Maltese exclusively during lessons	Count	2	0	0	2
	% within school types	0.2%	0%	0%	0.1%
	% across school types	100%	0%	0%	100%
Other	Count	57	56	6	119
	% within school types	5.5%	8.1%	3.9%	6.3%
	% across school types	47.9%	47.1%	5%	100%

Don't know	Count	105	50	9	164
	% within school types	10.2%	7.2%	5.5%	8.7%
	% across school types	64%	30.5%	5.9%	100%
Total	Count	1029	694	152	1875
	% within school types	54.9%	37%	8.1%	100%
	% across school types	100%	100%	100%	100%

$$\chi^2(14) = 52.85, p=0.000$$

A closer look at Table 1.7, specifically at the row percentages across school types, indicates that there are more State (61.6%) and Church school parents (33.7%) who tend to believe there is indeed need for teachers to be specialists in the language they are teaching so as to provide learners with a more authentic language learning experience. On the contrary, only 4.7% Private school parents chose this response. It must be pointed out that this support for having specialised teachers in English is not new. In fact, in her monograph, 'Profiling English language use in Malta', Sciriha (2013, p.64) had also found that parents were all for having specialist teachers to teach English because the general mind-set was that quality of the content being passed on, and more importantly the way lessons would be imparted through the use of accurate pronunciation and use of the language would prove to be beneficial to the students.

The second most common response indicated by parents in this present study was a response that was selected 23.7% of the time. Parents indicated the need for more time to be devoted to spoken Maltese within the classroom. Unfortunately, both teachers and parents complain about vast curricula, sometimes loaded with information that is not always that relevant to the students' needs in addition to the fact that there is little time that may be spared to having spoken interaction within the classroom. On the other hand, although the researcher believes that more participation in class would certainly allow students to practice their target language and enrich themselves by being exposed to the language when they listen to their peers, there is very little time that may be devoted to the spoken medium, keeping in mind the fact that class numbers are not small.

The third most-cited suggestion by parents was to have more use of Maltese in the curriculum (16.7%). The National Minimum Curriculum (1999) had directed schools to make use of English for subjects such as English, Maths and Science, whilst other subjects such as Maltese, Religious Studies and Social Studies were to be taught through the medium of Maltese. The fact that parents cited this suggestion amongst others, shows the understanding that exposure to quality Maltese is somewhat limited in some schools.

Amongst other initiatives, parents recommended:

- a) keeping the two languages separate - the One Parent, One Language approach has helped in raising bilingual children successfully. Having part of

a sentence spoken in English and part spoken in Maltese was not helping improve proficiency in either language.

- b) giving more importance to Maltese by making further use of the language through the use of e-books and other technology - the need to have more interesting books in Maltese in all school libraries, as well as the need to have Maltese language programmes that would be of interest to young children was also frequently cited by parents.
- c) that they themselves adopt a proactive approach through collaboration with the school to give priority to both languages, without the constant code-mixing that does little to help students acquire proficiency in either language.
- d) empowering parents to help their children on their journey towards bilingualism. At times, parents themselves are at a loss, particularly when they themselves cannot cope with Maltese or with the subject matter being tackled at school.

Towards improving English language proficiency – parents’ perspectives

Parents were asked what may be done to improve the level of English teaching in school. As shown in Table 1.8, the most commonly-selected response selected by parents to help improve the level of English being learnt by their children was to allow for ‘more time for spoken English in class.’ This was a response selected no less than 552 times (27.5%). The second most common suggestion was that of having ‘specialist teachers in English’, a response selected 525 times (26.2%), whilst the third more popular suggestion was to have ‘earlier exposure to English’ a response indicated 436 times or 21.8% of the time.

Table 1.8: Parents’ suggestions towards improving the level of English in schools by Type of School

		Type of School			Total
		State	Church	Private	
Specialised teachers in English	Count	326	175	24	525
	% within school types	26.2%	26.2%	26.7%	26.2%
	% across school types	62.1%	33.3%	4.6%	100%
	Count	280	136	20	436
	% within school types	22.5%	20.4%	22.2%	21.8%
Earlier exposure to English	% across school types	64.2%	31.2%	4.6%	100%

More time for spoken English in class	Count	337	195	20	552
	% within school types	27%	29.2%	22.2%	27.5%
	% across school types	61.1%	35.3%	3.6%	100%
More use of English in the curriculum	Count	164	71	12	247
	% within school types	13.2%	10.6%	13.3%	12.3%
	% across school types	66.4%	28.7%	4.9%	100%
Use only English in the early years	Count	35	12	3	50
	% within school types	2.8%	1.8%	3.3%	2.5%
	% across school types	70%	24%	6%	100%
Use English exclusively during lessons	Count	2	0	0	2
	% within school types	0.2%	0%	0%	0.1%
	% across school types	100%	0%	0%	100%
Other	Count	30	32	2	64
	% within school types	2.4%	4.8%	2.2%	3.2%
	% across school types	46.9%	50%	3.1%	100%
Don't know	Count	71	47	9	127
	% within school types	5.7%	7%	10%	6.3%
	% across school types	55.9%	37%	7.1%	100%
Total	Count	1246	668	90	2004
	% within school types	62.2%	33.3%	4.5%	100%
	% across school types	100%	100%	100%	100%

$$\chi^2 (16) = 20.05, p=0.218$$

a) - More time for spoken English practice in class

As has already been mentioned, it is no secret that syllabi in Maltese schools are rather loaded. Teachers know it is always a struggle to manage to cover a syllabus in good time. Giving children the opportunity to be able to express themselves through the spoken medium of the target language is of course ideal and necessary and a re-evaluation of the curriculum content might be necessary.

Potentially, educational authorities could look at the successful Finnish educational systems, where the focus during the early primary school years is more on active engagement and understanding of the world and the way it works, possibly putting literacy on the back burner, whilst immersing young children in a world of spoken interaction, where creativity and expressive skills are put on the forefront, rather than exposing children to curriculum content which might be unnecessary and inappropriate during the primary years. This is a crucial time when the critical period for language learning should be fully exploited with attention being given to the development of comprehension skills which precede production. This might be one of the sectors that we may truly improve upon.

b) - Introducing Specialist English language teachers in the primary classroom

The second most-commonly selected response was the need to once again have ‘specialist teachers in English’ (26.2%), a selection indicated 525 times. This response was the highest in State schools (62.1%), followed by Church school parent respondents (33.3%). Only 4.6% of Private school parents (4.6%) selected this response.

Parent respondents further commented that ‘The teachers should have better English. In general, some texts given at school are very poor’ (This was a comment made by a Church school parent hailing from the Northern Harbour area). Yet another parent complained that ‘We should have teachers who are able to speak and write good English’, and in the words of another, ‘The children need to be exposed to English without switching or reverting to Maltese – no translating or code-switching.’ Yet another parent went as far as to say that we should have where possible, ‘British teachers with a good British accent (because when) Maltese people learn English in school, they think they might be good (at it but) when they come to talk to a British person, (the latter) can’t understand anything (that the Maltese people say).’

c) - Making English a priority during the early years

The third most commonly selected response (21.8%) selected 436 times, was the call for earlier exposure to English in the primary school sector. This response was most commonly selected by State school parents (64.2%), followed by Church school parents (31.2%) and lastly by Private school parents (4.2%).

d) - Parents providing adequate target language exposure in the home domain

Other parents also rightly believed that a school and its teachers cannot perform miracles and that support from home was crucial if successful language learning was to take place, ‘My children are English speakers and they have no problem with this language’, whilst another parent maintained that, ‘It has to come from the family.’ This is all very well, if the parents or the guardians in the home domain can support quality English language use and are at home long enough to expose their children to quality English language use. If this is not the case, then a child would only receive English language exposure from television programmes and the rest of social media.

Concluding comments

Data collected revealed that 71.4% of all parent respondents claimed that they used Maltese with their children in their home domain and this reaffirms the fact that Maltese is the predominant L1 spoken within the Maltese household. Moreover results have also shown that in the majority of State schools as well as in some Church schools, students are exposed to what is a predominantly Maltese language environment in the school domain.

Forty-seven point one percent (47.1%) of the respondents are aware of the fact that Maltese is the predominant language in the school domain. What is surprising is the relatively high percentage of 32.5%, who are under the impression that English is the language that dominates the school environment. This impression is rather misleading. As Camilleri-Grima (2012) has noted,

In Maltese classrooms, there is continual interaction between the written text in English as the basic point of reference, and the oral discussion in Maltese (with code-switching) through which participants reiterate, interpret and reinterpret the written text. By using Maltese and code-switching, participants reason out problems for themselves, and find their ways to the solutions required

(Camilleri-Grima 2012, p.556).

This study has revealed that although 41.4% of all parents are 'very satisfied' with their children's spoken Maltese, only 16.1% described themselves in such positive terms when asked about their satisfaction with written Maltese. Therefore this raises some questions, since if one is able to speak a language but has limited written proficiency, there is the danger of missing the necessary threshold levels of competence (Cummins, 1976) that is absolutely vital if cognitive advantages yielded by a sound bilingual education are to be reaped.

Moreover, parents rated their children's spoken English far better than they rated their children's written English, with most (58.4%) claiming to be 'satisfied' with performance at this stage. Those respondents claiming to be 'very satisfied' with written English only amounted to 26.8%. It seems to be evident that whereas parents consider themselves as being satisfied with the spoken aspect of English, there are yet again differences which show written English to be more challenging. A distinction however must be made between students attending the three school types. This study has shown Private school parents to be the most satisfied with both English oracy and literacy, whilst far lower percentages exhibit this same degree of satisfaction from both State and Church school parents.

Private school children hail from a home background where the L1 is predominantly English. They are then immersed in an education system where their L1 is further developed and hence parent satisfaction with progress made is thus understandable. On the other hand, the situation in State schools is one wherein some students struggle with a system that would make comprehension much easier had the language of instruction been the language they felt most confident in. The relatively high rate of dissatisfaction with written English is thus made evident in the responses of State school parents, where 18.7% express dissatisfaction; whereas this percentage decreases to 10.3% for Church school parents, given that Church schools expose their students to far more English in a context where English is more than simply a language of instruction. Indeed it is the medium of communication between students themselves, whilst also being used as the language of communication in most Church schools.

This gap between spoken and written proficiency in both Maltese and English is reflected in the overall finding - only 50% of the parents who participated in this second phase of the study, predicted that their children would be sufficiently fluent in both languages. Hence, it is Church school parents who mostly believe that fluency was potential reality for their children at the end of the Primary Years' cycle.

In contrast, less State school parents (48.1%) and even less Private school parents (28.7%) said that bilingual fluency was going to be a reality for their children. This goes to show therefore, that not all children are being equipped to deal with the challenges or reap the advantages that an intensely additive bilingual programme should offer. Despite current standards and current practices and despite parent satisfaction at this stage in their children's lives, children will be making the leap into the secondary school system however some students will be offset by the apparent disadvantage of being fluent in one language but not in the other, when both are needed for their academic success. A lack of fluency in either one or the other language, act as a spoke in the wheel of success and is one of the reasons why some students inevitably lag behind or falter. Unless rigorous, quality exposure to both languages occurs as from the earliest days of primary school education and unless parents contribute by exposing and supporting their children's first and second target languages, then it seems that illiteracy, or weakness in either or both languages will hold some children back from achieving their full potential.

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Bio-note

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Gramsci's *Philosophy of Praxis*

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Abstract

Gramsci's *Philosophy of Praxis* was an attempt to present Marxism as a political philosophy promoting the inter-definable relation between theory and practice. No practice without theory; every man was a philosopher. Marx's call to change the world (act) more than interpret it (think) did not repudiate philosophy. It re-affirmed the unity theory-practice contextualising it in history. This characterised the intellectual project of the *Prison Notebooks* as the way ahead for the political affirmation of the working class. Praxis became a pedagogical, consciousness-raising practice. Enriched by other concepts – structure-superstructure (mode of production), intellectuals-working class (historic bloc) – Gramsci's praxis was also an attempt to prevent Marxism, philosophically presented as *historical materialism*, from morphing into metaphysics and vulgar materialism. Respecting the strictures of 'translatibility', praxis is adopted to discuss the 1970s industrialisation and its aftermath in Malta.

Keywords: *Gramsci, praxis, philosophy, politics, Malta.*

Introduction

Antonio Gramsci was born in 1891 in Ales (Sardinia). Following his education on the island, he gained a scholarship and began to study modern linguistics at the University of Turin. However, political and economic developments in Italy and outside, turned his attention away from academic exercise to political activity and journalism. He was elected to parliament in 1924 as a member of the Italian Communist Party he helped co-found. When the Fascist government relinquished basic freedoms, Gramsci was arrested on November 8, 1926, still an MP, and sentenced to a 20-year prison term. He began his *Prison Notebooks* (henceforth *PNs*) in February 1929 and stopped in April 1935, physically and mentally exhausted. Extremely weak, in April 1937 he was released and died a few days later in a health clinic.

In the *PNs*, Gramsci studied the relation between theory and practice within the Marxist tradition. This included how the study of *philosophy* contributed to political and economic practice. The goal was to cleanse Marxism, philosophically framed as historical materialism, from mechanistic and deterministic trends; the tradition was transformed into a *philosophy of praxis* (henceforth *PoP*). Gramsci followed this

path heralded by Marx's call in his *Critique of Hegel's Philosophy of Right* for the realisation of philosophy by a combative progressive movement that transcended prior German philosophy, considered strong in theory but weak in achieving the emancipation of the masses.

The head of this emancipation is philosophy, its heart the proletariat. Philosophy cannot realize itself without the transcendence of the proletariat, and the proletariat cannot transcend itself without the realization of philosophy.¹

Re-affirming its unity with practice, "theory also becomes a material force as soon as it has gripped the masses." (ibid.)

This re-iterated the call in the *Theses on Feuerbach* (1845; henceforth *Theses*) to change the world rather than merely interpret it. These two facets of the PoP can be derived from this.

Italy

In Italy, the PoP was developed as an autonomous philosophical system by the Italian Marxist, Antonio Labriola. The "marrow of historical materialism", he wrote, it moved "from life to thought, and not from thought to life; this is the realistic process" (in Haug, 2000, p.6). Besides its *Theses*-based call to arms, the autonomous status inspired Gramsci to take the intellectual challenge to high culture (Burgio, 2014, 414-447). In retaliation to Croce's downgrading of Marxism to a canon of research, Gramsci rectified:

... at the level of theory PoP cannot be confounded with or reduced to any other philosophy. Its originality lies not only in its transcending of previous philosophies but also and above all in that it opens up a completely new road, renewing from head to toe the whole way of conceiving philosophy itself. (Q11:27)²

Both Croce, Labriola's moral philosophy student at the University of Rome, and the other Italian philosopher, Gentile, wrote texts on Marxism but both took praxis to the political Right. Croce was to have an impact on Gramsci (Hegel and Machiavelli). His secularism and anti-positivism, a moral and intellectual stance more progressive than other alternatives, and relations with the French syndicalist Georges Sorel, made him popular with the Left. Gramsci's youthful Croceanism was revised in the *PNs*.

1 Available from <https://www.marxists.org/archive/marx/works/1843/critique-hpr/intro.htm>. [Accessed on August 31, 2019].

2 Q stands for *Quaderno* (Notebook), followed by the note number. This accords with Gerratana (Gramsci, 1975).

Gramsci thought the outspoken anti-communist Croce was correct in his attack on materialist Marxists and the need to liberate Marxist thought from positivist dogma. Notwithstanding authorship, all intellectual material had to be subjected to the same critical rigour. Croce's role also drew attention to culture and philosophy in politics, and the role of the great intellectuals in creating (or not) a historic bloc of intellectuals and working class (Q10/I:12). For Gramsci, he was a prop for passive revolution with its "dialectic of conservation and innovation" (Q8:27). In line with this concept re-elaborated from Vincenzo Cuoco's reference to the 1799 Neapolitan top-down democratic experiment lacking popular support, Croce's histories express a liberal fear of the masses. In *Theory and history of historiography*, Croce countered Marxism's totalitarian ideology with his 'religion of freedom' but, as Gramsci counter-attacked, his ethico-political history was a "taming of Hegelian dialectics" and "part of a liberal utopia that aims to banish from history the destructive moment and transform contradictions into differences" (Haug, 2000, pp.3-4). Gramsci considered this elite intellectual practice as philosophic obfuscation.

He believes he writes a history in which the element of class is exorcised and instead he describes with great accuracy and merit the political masterpiece by means of which a determinate class manages to present and to have accepted the conditions of its existence and its class development as a universal principle, as a conception of the world, as a religion, that is, he describes in reality the development of a practical means of government and domination. (Q10/I:10)

Conceptions of the world and consciousness

In 1929, on the first page of Q1, Gramsci set forth the need to study the "theory of history and historiography". This resurfaced in a letter of the same year to Tania, his sister-in-law. Concurrently, he translated Marx's *Theses* and the historico-political 'Preface' to *A Contribution to the Critique of Political Economy* (1859; henceforth *Preface*), both fundamental texts for the PoP. Discussing it in terms of historical materialism, Gramsci placed the accent on 'historical' instead of 'materialism', the latter more prone to metaphysical temptation. This spurred him to criticise Bukharin's Marxism as "metaphysical or mechanical (vulgar) materialism" (Q11:22) in terms of causal laws explaining both natural and social world; determinism and rejection of free will. This was regress to pre-Marxian metaphysics searching for the eternal (Q4, p.40). Instead, to understand the 'nature of man', one starts from social relations in historically determined social formations rather than via 'pure' metaphysics. As "absolute historicism", he wrote, the PoP was "the absolute secularisation and earthliness of thought, an absolute humanism of history" (Q11:27). Althusser (2006) was to remain unconvinced: the role of philosophy was ahistorical. Countering metaphysics was one thing; drowning theory in historicism,

another. For Althusser, Marxist dialectical philosophy (not historical materialism) corrects knowledge and defends theory from ideology and is not a conception of the world. However, this suggested theory as science's gatekeeper, alienated from class struggle. This dialectical materialism was rather undialectical when what was needed instead was for it not to be a "a philosophy of Marxism, but a philosophy for Marxism" (Thomas, 2009, p. 34).

For Gramsci, class conflict had to do with consciousness building and philosophy was a tool in class ideological relations. However, besides external challenge, this faced problems within Marxist theory. In his *Preface*, Marx describes social relations being independent of the will of the agents while social consciousness corresponded to the economic structure.

The mode of production of material life conditions the general process of social, political and intellectual life. It is not the consciousness of men that determines their existence, but their social existence that determines their consciousness.³

Gramsci was to conceptually re-integrate *will* and redefine Marx's superstructure(s) as the consciousness-forming political and ideological context outside the exclusive determination of the economic structure. Superstructures are not "mere appearances" or "less real", as suggested by Croce (Malinowski, 2005, pp. 971-2). 'Appearance' is attributable to superstructural mutability and not to historical validity: "'Man acquires consciousness of social relations in the ideological terrain': is not this an affirmation of the necessity and the validity of 'appearances'?" (Q8:60). The terrain is where, in Gramsci's terms, "every man is a philosopher", developing a concept of the world, not necessarily elaborate or specialised, but reflected in his action, common sense, and language. This is where civil society becomes a central concept, similarly re-elaborated by Gramsci. Thankful for its bourgeois creation, the subaltern masses had an opportunity for ethico-political emancipation subverting traditional dominant-subaltern relations (Finocchiaro, 2002). To protect it from metaphysics, following Lenin, Gramsci developed the *hegemonic apparatus*. Buci-Glucksmann described how this "qualifies the concept of hegemony and gives it greater precision ... as a complex set of institutions, ideologies, practices and agents (including the 'intellectuals')" (1980, p. 48). Far from speculative and generic political theory, the PoP has to tackle concrete and established hegemonic apparatuses expressing the materiality of class— the Church, schools, trade unions, etc.—and dismantle their social basis. It also confirms the *extended state* concept combining formal, political institutions with civil society's hegemonic forces. Faced with crowded 'trenches' and 'permanent fortifications' in civil society, politics becomes a war of position. In it, the PoP does not exclude the ethico-political and instead attaches "full weight" to the cultural factor, to cultural activity, to the necessity for a

3 Available from <https://www.marxists.org/archive/marx/works/1859/critique-pol-economy/preface.htm>. [Accessed on August 31, 2019].

cultural front alongside the merely economic and merely political ones" (Q10/I:12). This pulls philosophy toward politics.

Praxis, a pedagogical concern

As a politician and journalist, Gramsci was in a constant relation with the social milieu projecting a specific role for the intellectual. There are individual intellectuals with their "more or less subjective and arbitrary ideologies" and the 'elite' Renaissance intellectuals who educate people 'from above', shying away from political action; others are "organic" or "collective" (the Party), ensuring the "'hegemony' of a ruling class by carrying its 'conception of the world' (or organic ideology) into the everyday life of all men" (Thomas, 2009, p. xxiv). Gramsci historicizes this in the transition from castal logic to capitalist modernity's fluid inter-class mobility. Caste survives amongst the clergy, high officers in the army and bureaucracy and traditional intellectuals in academies and university, etc. Caste is also recalled when profitable to the dominant class (Burgio, 2014, pp. 176-7). Still, the bourgeoisie recognised "the will of conformism" and hence, ethnicity in the conception of the law and function of the State as it attempted to absorb and assimilate other classes. For Gramsci, this extended state beyond the formal was an educator not exclusively limited to private economic interests. This is associated with "Hegel's doctrine of parties and associations as the 'private' woof of the State", a French Revolution legacy, and described as,

... government with the consent of the governed—but with organised consent, and not generic and vague as it is expressed in the instant of elections. The State has and demands consent, but it also 'educates' this consent, by means of the political and syndical associations; these, however, are private organisms, left to the private initiative of the ruling class. (Q1:47)

Nonetheless, the dominant class still has the initiative in civil society creating a social basis for its hegemonic leadership. Suggestions of passive revolution follow when the state's ethical or emancipatory claims are shown to be empty words, and political debate is bureaucratised and technicised. Once again, philosophy has a role.

The philosophy of an epoch... is, therefore, nothing other than the 'history' of that epoch itself, nothing other than the mass of variations that the leading group has succeeded in imposing on preceding reality. History and philosophy are in this sense indivisible. They form a 'bloc'. (Q10/II:17).

The PoP becomes the alter ego even when considering transitions to socialism that were complicated in the West:

It is the expression of these subaltern classes who want to educate themselves in the art of government and who have an interest in knowing all truths, even the unpleasant ones, and in avoiding the (impossible) deceptions of the upper class and—even more—their own. (Q10/II:4)

Malta

Taking philosophy, politics and history integral to Gramsci's PoP in order to elicit meaningful links between two separate realities, and furthermore, across time, is open to a number of traps, first and foremost that of pushing theory beyond its context. Significantly, this association is a bedrock criterion of PoP. Liguori consoles: "Something is always lost in translation" (2015, p.210). It suggests caution. Another suggestion is to advance from history. The first step is to set the Maltese context in the 1970s. Beforehand, one final reflection. The arguments here deal with political and ideological, historically-determined social relations.

The Malta Labour Party (henceforth MLP) won the 1971 general elections and remained in office for sixteen years. It realised an export-based industrial manufacturing agenda. The social structure was affected. The mass of local industrial bourgeois was never enough and when state-assistance (wage freeze and protectionist policies) stopped, they went back to traditional merchant capital and real estate (Vella, 1994). Industrial workers employed by private capital, not colonial administration, were a novel sector represented politically by the governing MLP and its ally, the General Workers Union. Forced to be "functional substitute" to a weak bourgeoisie (Vella, 1989, p.194), government provided political leadership (populist and, with the Nationalist Party, henceforth PN, dispelling structural tensions in the parliamentary arena); economic entrepreneurialism (welfare, investment incentive schemes, vocational training, etc.); and cultural innovation (secularisation, State-Church separation, etc.). The petty bourgeoisie was less homogenous. The number of traditional, small-scale producers, traders and small-holding farmers decreased; the new recruits, increasingly university-trained, of engineers and technicians, accountants and managers, or state administrators, blossomed.

Academics, unless directly disturbed, appeared unperturbed. Amongst others, there was an "apparent inability or unwillingness (or both) of Maltese sociology to consider Malta's economic development in a balanced way" and, Vella added, specifying industry, it was "a clear indication that sociologists are hardly free from the influence of hegemonic pressures in society" (2012, p.243). Other intellectuals remained aloof, not feeling the need for cultural contact with the 'simple' (Liguori, 2015, p.105), except to reify traditional tools, legends, etc. Some did not escape change. Rev. Peter Serracino Inglott (henceforth PSI) ousted the scholastics as he reorganised the philosophy department at the University of Malta (henceforth

UOM), only for the Faculty of Arts and that of Theology to be suppressed from campus in 1978, not fitting in the major UOM reform by the MLP government to rid the campus from pre-industrial professions – notaries and lawyers, doctors, priests and teachers. The Theology case confirmed the need to secularise public space; eventually, under a post-1987 Demo-Christian PN government, it was important enough to return to campus and to give the Church privileged approval of full-time staff appointments by the UOM's Philosophy Department. Whilst the MLP Reform aligned structure (industry) and superstructures (social reproduction), for PSI, the 'contemplative' scholastics were ill-prepared for new dynamics. He intended to break the detachment from society of "Catholic spirituality and praxis" (Montebello, 2009, p.109). Public space, not least in the ever-growing social media where culture industries were becoming popular, socio-political tools aiming to shape social consciousness, had to be re-occupied. Foremost in media expertise, Rev. Joe Borg's page on the UOM website illustrates his presence and practice. PSI's agenda was still on at the turn of the century; Anthony Spiteri proposed a transcendence discourse within "incarnational and praxical coordinates" intent on socio-political action (1997, pp.121-2).

This makes the role of PSI, given obvious differences, arguably close to that of Croce as discussed above. Both were popular across social class boundaries, attracting Left followership. Both innovated as they faced traditional intellectuals. Croce, who was minister for Public Education in Giolitti's government, developed a conservative Liberal philosophy of practice (Q15:62); PSI supported the 'liberalising' conservative PN amongst others as policy-maker, as the prime minister's private consultant, and in the 1988 Education Act (which received heavy criticism for content and gestation by the Liberal philosopher Wain in *The Maltese national curriculum: A critical evaluation*, 1991). J. Friggieri, provided a seamless continuity in succeeding PSI as head of the Philosophy department and was also a PN MEP election candidate. Similar to Croce (the Italian from outside university circles), PSI introduced a relatively more liberal, non-dogmatic language and non-provincial morality in philosophy (Montebello, 2009, p.109) and wanted philosophy to tackle political and scientific issues. And yet, Montebello adds, his texts were unhistorical and severed links between philosophy and the social context or else confirmed a conception of the world based on the age-old reason-and-faith balance. As in the case of Croce, one needed to discover what was left out. PSI was unable or unwilling to appraise real problems historically or politically, reducing them to "exclusively linguistic (or artistic) problems", argued Vella (1989, p.177). This "dialectic of conservation and innovation" (Q8:27), understood here as "the critical search for what is equal in the apparent diversity, and distinct and even opposite in the apparent uniformity" (Q13:36), draws PSI to the same 'cultural innovation' boat as MLP Prime Minister Mintoff. The odd coupling is focal. Within their organisations there was a recognition of deep-cutting crises as the Church struggled against secularisation and the MLP faced late peripheral industrialisation. This uncovered contradictions

that determined immediate efforts by groups and personalities bent on conserving the relevance of their organisation, showing the structure is correctible and their role defensible. In their different fields, PSI's popular status amongst philosophers and Mintoff's high reputation amongst politicians appears to indicate 'success'. As with PSI's innovation and conservation, Mintoff's praxis, with an "explicit distrust of 'theoretical' discourse and of 'intellectuals' generally" (Vella, 1989, p.190), increased popular participation in politics but participants remained supporters, exhibiting "doses of the traditional adaptations to powerlessness for many years to come" (Zammit, 1984, p.130), while his concentration of power increased.

Conclusions

The **Marxist tradition** was absent in Malta in political practice (excluding the activities of a restricted group), and a combative movement that could realise a progressive philosophy was identifiable instead in the anti-colonial stream represented by the Dockyard workforce. The Liberal fear of the destructive moment (see Croce above) was exploited and transformed into a counter-praxis against this politicised movement. Mintoff on his part managed to ensure its integration within his political agenda by tackling the GWU pragmatically. He was assisted by the fact that the overwhelming majority of GWU members were MLP supporters.

Marxism was almost absent in theoretical practice; it could always guide **research towards meaningful and comprehensive observations**. Gramsci's conceptual armature qualifies it further. Thus, **passive revolution's** dialectic of conservation and innovation was identified in the praxis of PSI and Mintoff. The former's intellectual practice of philosophy performing as a renovated conception of the world, worked for the PN's building of class alliances with the new petty bourgeoisie (and associated expectations). PSI provided valuable assistance to Church and Party. Gramsci's critical descriptions of how historic blocs of intellectuals and social classes/sectors are created is valuable in this case. PSI's contribution worked against the MLP already suffering the backlash of its historically necessary political and cultural protagonism promoting its economic agenda.

Gramsci's redefinition of Marx's **superstructure(s)** as the consciousness-forming political and ideological context outside the exclusive determination of the economic structure gave resonance to civil society's concrete and established *hegemonic apparatuses* of Church, political parties, schools, trade unions, etc. PSI's contribution to state responsibilities confirms the **extended state** concept combining formal political institutions with select civil society hegemonic forces illustrating the 'full weight' of the cultural factor. Instead of becoming an opportunity for subaltern ethico-political emancipation subverting traditional dominant relations, civil society was the terrain that made the transition to socialism, promised by the MLP, complicated, and it hardly left the ideological field. It indicated the dominant

'history' of the time, i.e., what the ruling political group attempts to impose as reality. This is how history and philosophy become indivisible and form a 'bloc' (Q10/II:17). Paradoxically, the world projected by strong economic groups supporting the PN would, arguably, be more of a game-changer of conceptions promoted by the conservative stream than by the MLP's socialism.

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Bio-note

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Perchlorate Environmental Occurrences, Health Effects, and Remediation Technologies

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Abstract

Perchlorate is a widespread pollutant in the environment. It can be produced naturally by atmospheric photochemical reactions or synthesized in large quantities for industrial, military, and pyrotechnic applications. Perchlorate can affect human thyroid function by interfering with iodide uptake and thus has significant public health ramifications. This presentation will provide the current state of science and technology with respect to the source and occurrence of perchlorate in natural environments, its risk assessment, and recent advances in treatment technologies to remove perchlorate from contaminated water. Although perchlorate is a powerful oxidant, it is highly soluble and stable in water and soil and can thus persist in the environment. The discussion will focus on various treatment technologies such as selective ion exchange, reverse osmosis, and biological reduction which can be used to remove perchlorate from contaminated water and thus to minimize its health risks to the public.

Perchlorate contamination in groundwater and soil is an emerging environmental concern in many parts of the world. For many decades, synthetic perchlorate in the form of ammonium perchlorate (NH_4ClO_4) or potassium perchlorate (KClO_4) salts has been widely used as the primary oxidant in a variety of solid rocket propellants and explosives produced for military and aerospace applications (Gu & Coates, 2006). Besides military propellants and explosives, synthetic perchlorate has also been used in many commercial products, including fireworks, air bags, pyrotechnics, matches, safety flares, and perchloric acid (Aziz et al., 2006). As a result, widespread contamination of perchlorate has been found in soil, lakes and rivers, and even in drinking water and some food products, and thus has significant ramifications ranging from public-health concerns to potential impacts on agriculture, crop production, and environmental cleanup.

Man-made perchlorate is perhaps the largest source of contamination, and it is mostly synthesized via electrolysis. However, perchlorate has also been found in nature as a minor component in nitrate salt deposits in the hyperarid Atacama Desert in northern Chile (sometime referred to as Chilean caliche) (Bao & Gu, 2004; Ericksen, 1981) and other parts of the world (Böhlke et al., 2005; Dasgupta et al.,

2005; Jackson et al., 2005). The Chilean caliche contains an average concentration of perchlorate about 0.1% of the salt, but with concentrations as high as about 6% reported (Dasgupta et al., 2005; Ericksen, 1981). It was used previously as a source of inorganic nitrogen fertilizer. In California alone, it was reported that more than 477,000 metric tons of Chilean nitrate were used as fertilizer between 1923 and 1998 and may thus have contributed significantly to perchlorate contamination in soil and groundwater. Perchlorate is highly soluble in water, and this characteristic results in its ability to move from surface soil into groundwater when it enters the environment. Perchlorate is an anion (ClO_4^-) or an ionic substance and, therefore, it does not volatilize from water or soil surfaces. It is very stable and known to remain unreacted in the environment for a long period of time, unless it is under highly reducing conditions where some anaerobic microorganisms can cause degradation of perchlorate to other substances such as chloride.

Perchlorate can affect human thyroid function by interfering with iodide intake or absorption. Iodine is a nutrient required for the synthesis of thyroid hormone, which regulates certain body functions after it is released into the blood. Children and developing fetuses are more sensitive to be affected by perchlorate than adults because thyroid hormones are essential for normal growth and development. People exposed to high levels of perchlorate for a long time may develop a low level of thyroid activity, so-called hypothyroidism. On the other hand, perchlorate also has been used as a drug to lower thyroid hormone levels to treat people with overactive thyroid glands, so-called hyperthyroidism.

While costly, various treatment technologies are available to remove perchlorate from contaminated water and soil and thus to minimize its health risks to the public. Among these treatment technologies, ion exchange, reverse osmosis, and biological reduction are perhaps among the most widely used, although each treatment technology has its own advantages and disadvantages with respect to the treatment efficiency and cost effectiveness. Their pros and cons have been described in detail by Gu & Coates (2006). In general, reverse osmosis is a physical separation technique, in which a high pressure is applied on one side of the semi-permeable membrane to force water molecules to pass through the membrane, leaving behind the salts and contaminants. It is effective in removing perchlorate but is energy intensive and costly. Additionally, the presence of dissolved organic and particulate matters in water could easily cause fouling or plugging of the membrane so that it must be replaced frequently.

The ion exchange technology is commonly used, particularly for drinking water treatment at low perchlorate concentrations. In this process, perchlorate anion is exchanged with chloride adsorbed on ion exchange resins. The technology has been used widely for water treatment for more than half a century because of its simplicity and capability of operating at a high flow rate. However, different ion exchange resins are available commercially for perchlorate removal from contaminated water. They can be generally categorized as: (1) selective but non-regenerable strong-base

anion-exchange resins, (2) nonselective or low-selective anion-exchange resins with sodium chloride (NaCl) brine regeneration, and (3) highly selective and regenerable strong-base anion-exchange resins. In the first case, the spent resin cannot be regenerated using conventional brine washing technique (Gu & Coates, 2006), so it is either discarded or incinerated after reaching its sorption capacity. The resin bed must then be replaced after reaching its capacity. The change-out time for the resin depends on the feed perchlorate concentration and water quality. In the second case, the resin is regenerated by flushing with concentrated brine solution. However, because of its relatively low selectivity (or low sorption efficiency and capacity for perchlorate), the resin removes other common anions indiscriminately, such as sulfate (SO_4^{2-}) and nitrate (NO_3^-). Because these anions exist in contaminated groundwater or surface water usually at orders of magnitude higher concentrations than perchlorate, they occupy most of ion-exchange sites on the resin (>99%), resulting in an extremely low efficiency for perchlorate removal (Batista et al., 2000; Gu & Coates, 2006). Therefore, the spent resin bed must be regenerated frequently, producing large volumes of secondary brine wastes containing perchlorate. These factors contribute to relatively high capital and operating costs of conventional ion-exchange technologies.

Therefore, selective ion exchange is usually the preferred technology for treatment of drinking water with low perchlorate concentrations because of its treatment efficiency, longevity, simplicity, and minimal impact on water quality. The selective and regenerable ion-exchange technology is based primarily on the use of so-called bifunctional anion-exchange resins developed at the Oak Ridge National Laboratory and University of Tennessee (Gu et al., 2000; Gu & Coates, 2006). The bifunctional resin consists of two trialkylammonium functional groups optimized for its performance and sorption capacity. The technology has been demonstrated in both laboratory and field studies to have high efficiency and longevity in removing perchlorate from contaminated water at very low concentrations. It can treat about 100,000 bed volumes of water before a breakthrough of perchlorate occurs at an influent perchlorate concentration of about 50 $\mu\text{g}/\text{L}$ (Gu et al., 2000; Gu et al., 2007). This translates to a treatment period of about 5 months if it operated at 0.5 bed volumes per minute or about 1 year at 0.2 bed volumes per minute prior to resin replacement or regeneration. It is also important to note that the regeneration technology allows the resin to be reused while producing minimal secondary wastes and can therefore substantially reduce the capital and operational costs (Gu & Coates, 2006).

Biological treatment of perchlorate is also commonly used, in which perchlorate is break down by certain species of anaerobic bacteria when supplied with sufficient quantities of nutrients as electron donors (e.g., acetate or lactate), whereas perchlorate serves as the electron acceptor. The technology could be cost-effective and efficient, especially for treatment of groundwater or wastewater containing relatively high concentrations of perchlorate, dissolved organic matters, and/or high

total dissolved solids required for the growth of microorganisms. The technology has been used for both ex-situ water treatment and in-situ soil/groundwater treatment, such as the source contamination area containing high perchlorate concentrations. However, biological degradation could be ineffective or costly for treating drinking water with low concentrations of perchlorate (e.g., at tens or hundreds of $\mu\text{g/L}$ concentrations). This is mainly because biological reduction of perchlorate requires a high reducing environment, in which a highly active biomass must be maintained by continuously supplying nutrients (both electron donors and acceptors) to the treatment system. Additionally, post-treatment is often required in order to remove residual nutrients, anaerobic microbes and potential pathogens in water.

In summary, while perchlorate can form naturally, especially at Atacama desert, synthetic or manmade perchlorate is perhaps the largest source, which has resulted in widespread contamination of perchlorate in soil and water in the world. Perchlorate can impair human thyroid function by inhibiting iodide uptake or thyroid hormone production. Children and developing fetuses are particularly sensitive because thyroid hormones are essential for normal growth and development. Various treatment technologies are available to remove perchlorate from contaminated water, although it is important to consider site specific conditions (e.g., water quality, perchlorate concentrations, etc.), treatment criteria, cost and feasibility, regulatory requirements, and ecological concerns when selecting the most appropriate technology for removing perchlorate.

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Bio-note

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Good Practices to Managing Projects Better

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Abstract

The XXI. century increased the value of projects in the life of companies. Our economic system has not become simpler, and the tasks that companies need to manage on a daily basis have been further complicated. Having a really good project manager has become a key issue for a project success, because without proper project management practice, teamwork cannot be effectively coordinated. What kind of person should be an effective project manager? What does a good project manager need to know nowadays? This study addresses these issues and attempts to summarize the characteristics of a good project manager.

Keywords: *project, project management, project culture, project based organisation.*

Introduction

There is no doubt that several factors can determine the success of projects. The project itself is a unique, one-off, non-repeatable process that has the exact purpose and expected results, works on a budget, needs to be completed on time, and has a certain amount of resources needed (Verzuh, 2008). We initiate the project because some task, challenge, or problem cannot be satisfactorily solved by the usual, well-proven management solutions of the management, so a novel and planned combination of the applied solutions is needed. By definition, project success is achieved when the project triangle is realised in the classic sense, meaning that the project is executed within the given budget, on time and in the required quality (Daróczy, 2011). But would that really be the success of a project? Do these three pillars really determine how to talk about project success? What else is important for project success? This study seeks to address these issues very briefly and concisely.

New types of projects and especially the XXI century work environment requires us to be extremely human-centered and to find the right project leader. Project success can only be achieved if the right set of cost, time and quality requirements are put in place at the same time, but there is also a factor that can play an exclusive role in their development. Project management has evolved because we need the coordinated and targeted work of people who, through their activities, can meet the project's goals and expectations (Görög, 2007). Project management nowadays

is not only about managing resources efficiently, but increasingly about working together effectively with people and organising harmonious and effective work together. Environmental changes and the increasing complexity of our economy have resulted in more and more projects having to be solved by businesses. However, a growing number of projects increasingly require people who understand the project, who, through their capabilities, can contribute to the success of the project, and there is a great need for those who know how to manage them effectively. Project management is really nice because we can never manage a project twice in the same way; tasks, problems and solutions are always different (Görög, 2007, 2013).

There are no standardised tools, no replicable models, we always have to make the best decision for the situation, which is not always easy to make. By applying solutions from many other disciplines, project management aims to broaden the choice of decision support tools. There is a peculiar shift in terms of project success, as while the success of the project was mostly dependent on budget or availability of resources, project management has become a major factor in the human factor, people's behaviour, people's relationship to each other, mentions it as a success factor. Great emphasis is placed on working together, being collaborative, communicating, managing the project team, or creating a supportive environment for the project. This branch of project management, which is largely dependent on the human factor for successful project implementation, is called emotional project management. Project management is no longer just about cost or resources, it is not just "hard", meaning difficult and quantifiable, measurable factors that are important to the success of a project, it is also about people's motivation, goals, commitment to the project, and it also makes the work of the project manager more interesting (Kotter, 2009).

It is often said that project management is now an art of dealing with people, as the individual motivation and desire of the people working in the project team must be maintained, since without the creation of a project supportive environment there is less chance of working together effectively. Performance ultimately depends on working ability and motivation, so it is very important to include people with the right skills in the project. By doing so, they can contribute to the success of the project or work continually, enthusiastically and motivatedly to deliver the results, otherwise the lack of these will reduce the drive to deliver the expected results. People are among the determinants of project success, but this is not just about the effectiveness of the project team (Varga, 2017). The team can contribute to project success if it has the right dynamics, that is, individuals with the right abilities work together in the project team and can work well together to achieve the goal. In addition, an important role is played by a project leader who can properly coordinate the work of these actors, has the necessary motivation, and has clear ideas on how to achieve project success by well managing its people (and thus the project). Generally speaking, a project manager should understand many things at the same time, so it is not enough to have just the right project knowledge (Varga, 2017).

The project manager must be a good person to be able to accept the team members more widely, to communicate well with them, and to develop the relationships between the stakeholders that will facilitate the most effective work. For even though the best plan is the best valued resource, if the project manager is not able to motivate his or her people enough and drive them to the right performance. This is a key issue for project success, as international studies clearly confirm that 7 out of 10 projects end up failing, and in most cases, approximately 70% is due to inadequate human factors (Mochal, 2009). This proportion must be improved and the role of the person in the project work must be emphasised. These findings were supported by organisations such as the Standish Group, Ernst and Young or the Wellington Group. In addition, domestic project management organisations have been studying factors influencing project success and have come to the same conclusion as international research (Ernst & Young, 2006 (PMI, 2017; Standish Group, 2018).

Material and Method

In this hands-on overview, we sought to map the professional experience of several project managers and to identify the skills needed in general to help project success. We have had professional interviews with project managers who are leading project specialists in large companies, including MOL, IBM or Stadler. Each of these project leaders had one important point in common: All project leaders ranked the human factor as the most important. In addition, the project managers emphasised that each of them had some specific principles that they would always like to keep under all circumstances. Therefore, in general it can be emphasised that all project managers in the project management profession should have certain principles and be loyal to them. We made interviews with 20 Hungarian project managers.

As a results of the interviews: the project leaders agreed that they had principles. These principles showed only minor differences. It was also surprising to us that these principles really do appear and that a summary list can be drawn up in which these project managers generally agree. The most important principles can be summarised as follows.

- always be honest with the project and board members,
- no need to escalate, but if you really need to, you have to,
- enable scope expansion if timing and budget are not compromised,
- keep project information up to date,
- be in constant contact with stakeholders,
- be able to handle the emotions of team members properly,
- ensure that all communications are initiated by the project manager and not be missed,
- involve everyone in the planning process,

- in addition to project tasks, opportunities for personal reconciliation should be sought,
- the interests of the external supplier must always be balanced with the interests of the project,
- credibility is extremely important in maintaining trust,
- be able to show that we understand what we are doing.

The project leaders also agreed that involvement is extremely important and should be strongly built on members' abilities. Because the power of the team really lies in the community, it is imperative to take advantage of the opportunities that this offers. Valuable ideas, suggestions, alternative solutions should not be wasted. To the question of involvement, one of the project leaders answered only that: Post it! This is a general tip. Efforts must be made to promote that everyone can contribute to the identification of risks and additions. Conventional techniques may also be employed, e.g. the post it technique, which is real teamwork and really everyone's problem solving ability. However, post it does not only refer to technique, so it is not just traditional sticky notes to be placed on the flipchart. This also means that there must be an opportunity for stakeholders to be involved, whatever the factors influencing the project. Therefore not only involving people when there is a problem or identifying a risk, but practically anytime. Project Stakeholders can go beyond their traditional role and do more than just what is stated in the Activity Responsible Matrix (RACI) to achieve project success. RACI (be responsible for the given tasks!)¹ Assigning activities and tasks to stakeholders is essential for project success. Not only does the RACI matrix exist to define this, but many other matrices of this kind are known in the art (e.g., DACI matrix). However, whatever matrix you consider, each one has a very important project management function. They help you settle disputes with simplicity, mitigate and prevent conflicts, and help you clearly assign tasks. If the rules of the game are clear and precise, we can avoid misunderstandings, disputes, and, in particular, increased tension, resistance or feelings in the members of the project team that hinder the project work and its effectiveness.

The project leaders also agreed that the project manager can only be interpreted in conjunction with the team. The project manager is not a stand-alone player, though we call him a project manager (Varga, 2015). Without the team, the project manager would not be able to be interpreted, so the project manager himself can only perform his function through his project team. The key to a good project manager is to have a well-functioning project team, for which the project manager himself or herself takes specific and targeted steps. However, it is also important that the project managers take care of the interrelated and interdependent tasks. An important aspect is up-to-date and proper communication as it is the most important tool for managing the project team.

1 Responsible Accountable Consulted Informed

Communication is the most important tool in project management. According to the project managers, the role of human resources in project success has also increased. There are also some basic principles of human resources that every project manager should adhere to.

- Listen to project concerns!
- Treat stakeholders properly (eg based on their abilities).
- Keep trying to keep their enthusiasm!
- Listen to those who over-dimension problems and deal with them!
- Recognise the negative contributors!
- Identify the black sheep (s) of the project!
- Confirm that they have an important role in the project!
- Always ask for their opinion, but do not let them decide!
- Be one of the super users so they feel that they will be important after the project!
- Never escalate, always consult with him/her personally!
- We reward successes and partial successes and celebrate them!
- Don't break the enthusiasm of team members!
- Do not collectively punish. Let's be fair, objective!

As discussed earlier, project managers have general principles that they always adhere to or pass on to others. According to the project managers we interviewed, we have created a list that summarises the most important qualities. This list is by no means exhaustive and the Reader is left with the task of supplementing it.

What are the principles a project manager still needs to follow (enforce)? What they need to be good at?

- Focus on results and plans (task oriented)
- flexibility
- compromise
- being organised
- confidence building power
- proper communication
- openness and risk-taking
- honesty and trust
- political sensitivity
- Cultural sensitivity (people - centered)

The list was started by the task-centeredness and the human-centeredness that we already discovered in the Blake-Mouton grid (Varga, 2015). If we look at this list of 10 above, we can say that these capabilities may be needed for any project. In fact, it can be emphasised that each project manager should have a list of 10.

If you look at the list above, it is clear that the overwhelming majority of the factors appearing in the project management conditions are people-related. If the project

manager is not really able to communicate properly or understand the language of the project team, then the team's work and efficiency will be significantly lower.

There will be resistance, conflict, debate, confrontation, there will be more and more who will drill the project, in other words, the most important step is the attitude of the project manager and how to start managing the project (Varga, 2015). Another very important Top 10 list has recently been published in a Project Management Association blog post. Here, too, Tom Mochal lists 10 factors that can be helpful in managing successful projects (Mochal, 2009) Not all of these „list 10” are related to the human factor, but there are several that are directly related to people's abilities and attitudes.

- Design on the basis of a project definition document - the emphasis is on planning.
- Plan in detail - and only within the appropriate timeframe.
- At the beginning of the work, document the project management procedures.
- Monitor schedule implementation and costs, and keep track of work plan!
- Pay attention to signs of possible problems!
- Make sure that the sponsor of the project has agreed to make changes to the scope.
- Prevent the volume from slipping (scope creep).
- Identify risks at the start of work.
- Continuously evaluate the risks that may arise during the project.
- Address any issues as soon as possible.

The project managers we interviewed also emphasised that planning is extremely important, but in many cases, a very detailed schedule is not needed at the beginning of the project. It is more important to carry out rational planning that is tailored to the project result and purpose, as often changes in the project environment fundamentally rewrite the terms and conditions. The project leaders also emphasised that the following factors should always be taken into account when managing a project team:

- Meetings should be held at a sufficient frequency and should not over-manage the project team
- Do not end a meeting without producing results (eg deadlines, naming those responsible)
- In addition to the results, the steps required to achieve them should be monitored
- The project is never completed when the tasks are completed, so follow-up, stabilisation and periodic recheck are necessary, as well as continuous improvement
- Insist on the continued involvement of people.
- And one of the most important principles in managing a project team: emotions should be influenced instead of intelligence in most cases.

The project leaders also agreed that a precise project definition phase is essential for project success. Eric Verzuh, a renowned project expert, has identified five key factors for project success (Verzuh, 2008). These can be summarised as follows:

1. agreement amongst the project stakeholders on the project objective and project outcome
2. a properly designed plan to measure progress
3. accurate and continuous communication
4. controlled scope
5. support for management

The above list is clearly related to realisable project success. If we do not pay sufficient attention to these factors, we are more likely to expect the project to fail. The project leaders also agreed on this list, and one of them also pointed out that the Bible for Projects is the Project Statement. It is important to mention that the project charter should not be created for our own purposes and it is important that all key players accept it. These key players include Project owner, External PM and key stakeholders. Keep everything up-to-date, which can be said for other project documents. The project leaders stressed the importance of communication besides the statutes a good project manager communicates, communicates and communicates. In addition, it should be emphasised that a good project manager is constantly able to delegate, measure and make suggestions. A good project manager assesses the potential outcome of each task and only convenes Board members for a decision when it is really needed. Weekly status meetings should always be held with core members and team members from the relevant project phase. In addition, a really good project manager is able to keep a to-do list of tasks and questions, so that nothing can distract members and the project manager. Let's have a To Do list and a Q&A list! With continuous communication and availability, it would be extremely important for us to be able to build as much as possible on controlling and reporting activities. In order to measure the progress of the project, we need to carry out project monitoring on an ongoing basis, where we develop a special information system for ourselves to identify plan - fact differences. Project leaders agreed that this activity is one of the most important tools for measuring progress. There was also a consensus that the development of this system should always be on the agenda and efforts should be made to produce simplified, but meaningful, reports for managers and project members. Controlling needs to be continuous, with budget attention to milestone payments, and not to be afraid of project re-planning. One project manager briefly pointed out that what we can do to become a better project manager is that interpersonal competencies are key and must be developed first. How to learn that?

- a. the experience and tasks at work
- b. from the people we come in contact with

- c. from the difficulties that had to be overcome in previous assignments
- d. formal training / learning (we can also train ourselves)

Finally, the project leaders agreed that one of the most obvious reasons for dealing with problems is to find the roots and try to combat them. It will be very important to use the tools of thoughtful attention during project management, and project managers must be closer to team members than ever before. A really good project manager is credible, trustworthy and able to energise your work environment. A good project manager will find common ground with stakeholders in other departments of the organization and be able to find consultative solutions to any problem. The project manager also manages his own time well. An effective coalition of project leader and project team results in project success. If these two actors can work together effectively in implementation, there is a much greater chance of success in project success. Otherwise, the best and most ingenious project plan will fail if we cannot win over the stakeholders to implement the plan. Project marketing is already working on how to find sponsors for your projects so that fewer potential stakeholders are obstructing your project.

Summary

This brief summary paper set out a simple objective. We had to determine that the best way to influence a project success is to be able to manage project team members properly. A project manager should ensure that the project stakeholders contribute as much as possible to the achievement of the project objective, in other words to facilitate the achievement of the project objective. Clearly, with the right project environment and well-managed teams, success is much easier to achieve. It is also clear to us that in such a short study it is impossible to list the criteria for good project management. This would require more extensive research and more substantial analysis, which in fact has not been undertaken by any international organization on a larger scale. Although there have been minor studies, a truly comprehensive analysis is still needed today. Nonetheless, we trust that the above advice can be useful, as it has been formulated by project managers who have been working for many years on project implementation and management. Special thanks go to Izabella Papp, IBM Project Manager, Mihály Panyi, MOL Project Manager and Virág Vasas, Project Specialist at KÉSZ Group. Alongside them, several smaller project specialists and higher education professionals in project management have expressed their views, which we have incorporated into this study. In conclusion, the human factor will continue to emerge, and the advancement of emotional project management will be visible in the next few years. We also need to state that the project's golden triangle will indeed need to be reinterpreted, and it is really worth considering whether an effective human factor can really be the fourth pillar of project success.

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Bio-notes

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Own Capital to Credit - The Financial Practice of the Sme Project in Hungary

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Abstract

The project as action in the 21st century is one of the strongest calls. Without a project, no company can be imagined. Growth is the fundamental interest of every organisation and the most obvious way to do this is to start successful projects that also end successfully. Projects allow for corporate value growth and qualitative progress in time. Larger companies are at the forefront of project management, following best practices that can be copied by the SME sector. Many tools and literature are available for project management but success, in many cases, does not depend on the methodology. In order for a project to be truly successful, one should always pay attention to the evolution of the three baselines from initiation to closure. However, the cost of the three baselines is the most important: from where and to what extent the project can be financed. The aim of this study is to present the financing practices of the Hungarian SME project based on the results of a research, highlighting the most favoured and rejected sources based on the opinion of the responding companies.

Keywords: *project, financing, SME, primary research*

Introduction

Research shows that the Small and Medium-sized Enterprises sector is less financially conscious compared to larger firms. However, it is also true that their ability to obtain resources are rather limited. This statement is especially true when it comes to financial resources (Beck et al., 2015). The SME's credits were expansive before the crisis (Balogh & Nagy, 2014); they decreased since then and the situation worsened in the first half of 2013 (Fábián, 2014). Due to lack of finance, the sector is unable to grow, as demonstrated by those years after the crises. The financing of the SME sector has been examined by various studies, in terms of both its development and financial growth (Ahmed, 2013; Bumann et al., 2013; Liu-Hsu, 2006; Shabbaz et al., 2013). These studies examined this topic from many angles from the financial opening and liberalisation up to the developmental effect of the sector's financial economic growth.

The financing of enterprises will be discussed through two aspects. On the one hand we differentiate between internal resources which derive from the companies' operations and external resources deriving from the financial and capital market. On the other hand, there are short term resources- within one year – and long term ones – more than a year. The integration of these resources into a company's operation and finding the right ratio has been the interest of many professionals researching this topic. One thing that can surely be said is that there is not a single proved ratio which can be used universally for one given sector and same sized companies. They operate from different resources, they are older, have more experience and their financial relationships make them capable of receiving other types of resources (Cabra & Mata, 2003).

The Hungarian SME sector has been widely criticised in the past because of its financial dependence. At the same time, it needs to be mentioned that besides the financing aspect, these companies' competitiveness and their strategic management are also not based on high standards (Varga & Csiszárík-Kocsir, 2016). The local SME sector's capital market relations are very weak since they are restricted only to the share and debt financing. This method is highly influencing the practical financial strategy too (Csiszárík-Kocsir & Varga, 2015). The share financing does not come from the capital market but as IPO to the company. Consequently, it cannot be used for operation finance or only in a limited way. This is supported by the Hungarian National Bank's data.

Investment and financing are crucial topics in the life of the enterprises. The finance decisions determine those frames which guarantee the companies' long term competitiveness and success. An effective financial strategy tailored to the company's size and maturity enables the company to grow, invest and develop. The investment and finance decisions should always be handled together and both should be measured in context and with consistency. These investments' developments are key questions in the life of a country, in a national economy as well as in an enterprise. If the economy grows, GDP growth increases, leading to subsequent growth in enterprise.

The investments concrete interactions are the projects. However, an enterprise is only starting out with a project if it is able to run a sufficient source of funding. Inadequate financing decisions are also able to bring a well-designed project to failure. Thus it is very important to carefully and thoroughly plan the financial situation and funding. The planning is also important through all life-cycle of the project. The iterative model needs a very accurate planning process, instead of the agile method, when the planning is only a high-level planning (Rosenberger & Tick, 2018; 2019a; 2019b). The research described in this study has also examined the project risks (Csiszárík-Kocsir & Varga, 2017). The investigation showed that the vast majority of the risks are because of inadequate financial planning, incorrect funding decisions and poor cost management.

The literature provides a variety of sources and offers the opportunity to finance

projects. Before the crisis in 2008, funding was fundamentally credit-driven because unlimited liquidity makes it much easier and much more viable to lend a capital from banks. The 2008 crisis was a milestone in this respect, as the era of unlimited liquidity ended and banks became more cautious and prudent. After 2008, the banks were willing to finance a project by risking their money only after careful consideration. Subsequently, there were also financing opportunities such as Community funding, which had previously been available only for works of art (Bethelendi & Végh, 2014). Once community funding was made available to enterprise projects, the potential financier expanded further. It also provided venture capital funding as a way to provide a well-designed, viable project for good resources in the long run. Venture capital funding not only gives money to a project but it also offers its contacts and knowledge. Businesses in countries with an Anglo-Saxon financial system can use the option of issuing bonds but due to their insufficient financial knowledge and the underdeveloped capital market system, Hungarian companies still cannot count on the capital they can get through bond issuance (Csiszárík-Kocsir, 2017). Unfortunately, in the case of small and medium-sized enterprises, the situation is worse and they can count neither on venture capital nor on Community funding because of their size, investment activity and the volume of projects. However, by expanding the project financing activity of Community funding, small and medium-sized enterprises will also benefit from it in the future. For if an SME wants to invest in a narrower and wider environment, micro and macro-interested stakeholders will also be willing to participate actively in the project, even financially.

Hungarian companies, like the companies in the neighbouring countries, base their project activity on grants from the European Union and from the State. As long as they prove to be sufficient, they do not seek other market-based resources. However, it should be noted that market-based resources do not even seek the small and medium-sized business sector. They consider it risky and uncertain and so, they do not open up to their point of view. This situation was also observed in Hungary. Following the crisis in 2008, the lending activity that would have been necessary for the growth and healthy development of the economy did not start in 2013, like in many countries. This is why the Hungarian National Bank has launched the Growth Loan Program which has provided the small and medium-sized enterprise sector with the most difficult loans for investment and with development resources at a tolerable level of interest rates. The aim of the program was clearly to increase the investment activity of the SME sector in order to enable the sector, which is the largest employer, to be able to withstand the ever-increasing market competition under modern conditions. However, the 2008 crisis is not only a milestone for financiers but also for borrowers. Following the economic downturn in the aftermath of the crisis, borrowers became more cautious due to the increase in loans. Because of the fear of increased credit, they decided to postpone their investments and tried to use the tools available, while keeping their market. The Growth Loan Program also helped with the interest rate on the loans. Another objective of the program

was to launch the market-based lending of banks. Even with the increase in the value and number of investments, the program was clearly successful. However, it was difficult to start lending on the market basis.

Material and Method

The research results introduced in this study are part of a primary questionnaire research conducted in 2017. The research was carried out in Hungary with the help of a pretested and standardised questionnaire form. The present research was preceded by a previous survey among enterprises, which had been preceded by an in-depth interview analysis. The present questionnaire was created as a result of these two former rounds and it was a complex questionnaire covering the financing and investment activity of the enterprises. The survey paid special attention to the enterprises' project management and project financing practices as well.

During the research, we received 521 questionnaires but only 416 of them were tenable for inclusion in the sample. The results of the research are presented in this study based on the employment figures of the responding enterprises. The majority of the sample - 85% - is made up of smaller enterprises with less than 50 employees, which means 355 enterprises. The proportion of the medium-sized enterprises was 9% (38 enterprises) while the larger companies had a percentage of 6% (23 enterprises).

In this study, we would like to analyse the sample according to the financial stability of the enterprises. The composition of the sample is illustrated below. The figure shows that companies consider themselves more stable or totally stable (more than 80% overall), which may lead to more active capital market participation.

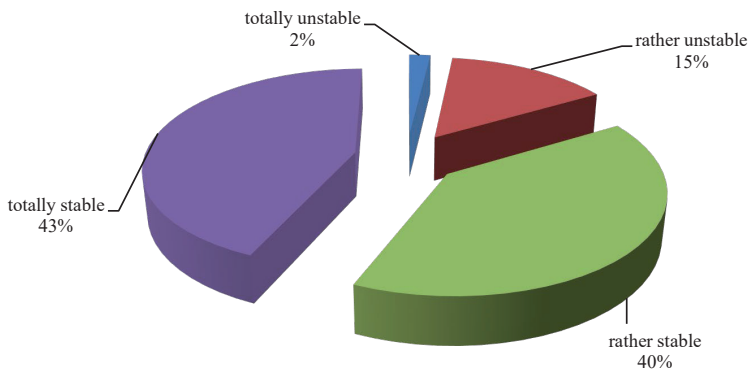


Figure 1. The consumption of the sample according to the financial stability
(Source: own research, 2017, N = 416)

Results

In our study, we sought to answer the question of the types of capital involved in the financing of projects by the companies that filled in the questionnaire, first, second, third, place or later according to the importance of the sources. The answers were weighted, the first-ranked sources were weighted 4, the second-ranked sources were third, and the third-ranked sources were weighted. The grouping feature is the financial stability of the enterprises. Here we work with the mean values obtained from weighted responses. The highest average values characterise the most preferred source type.

In terms of the overall sample, the respondent companies prefer to finance their projects primarily from their own resources, as shown by the average of 3.71. Respondents understand the recycled result under equity and the owner's resources. In addition to equity, it is also feasible to include non-refundable grants (3.15) as well as subsidized corporate loans (3.05). On the basis of the average values, these sources are "podium" based on the opinion of enterprises. Equity capital (2.83), project loan (2.51), supplier credit (2.39) and leasing (2.34) also have an average value of more than two. This means that although some of the businesses are not the primary source, they also use these options as a secondary or tertiary option. They can even be used as additional funding for projects. Regrettably, novel and mainly capital market-type sources such as venture capital financing (1.74), crowdfunding (1.71) and bond issuance (1.64) are almost absent from the project finance palette. Enterprises do not think about primary use in terms of non-subsidised loans (2.07), as shown by the average value. On the basis of the above, it can be said that the 416 companies in the sample are prudent: they are financing projects from their own capital or they are also willing to use resources that are cheap or free. Businesses also consider equity as having no cost at hand and which can be used immediately without cost. Even though equity is not a cheap form of financing, it is always necessary to count on the expected return of the owners, or if it is difficult to quantify, at least with the ROE indicator.

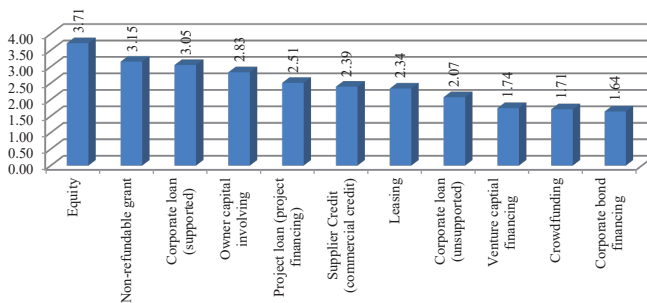


Figure 2. The structure of project funding sources according to the weighted opinions of the respondent enterprises (Source: own research, 2017, N = 416)

The results will be further analysed based on the financial situation of the companies, revealing the financing priorities and differences compared to the sample average. First, we present the opinions of some of the companies who considered themselves financially unstable (2%). In the case of these enterprises, the order of the sources of the sample average is also formed but in many cases, the mean values of their patterns are much lower than those of the whole sample. Financial instability also carries a high risk for the success of projects, which also severely hampers their investment activity. Interestingly, these companies are more confident in modern capital market instruments (crowdfunding, venture capital financing) than their competitors with a more stable financial background. However, in order for these resources to work, it must be a marketable product, an idea in the hands of the business, which is often absent.

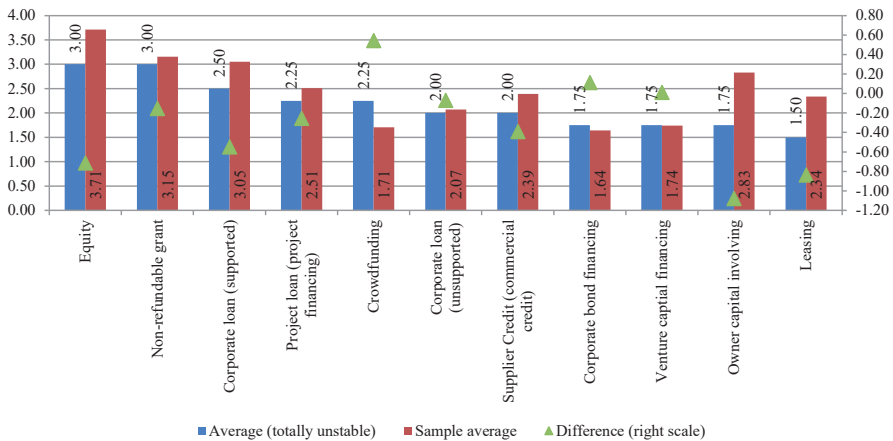


Figure 3. The structure of project funding sources according to the weighted opinions of the totally unstable enterprises (Source: own research, 2017, N = 416)

Enterprises that say they are more unstable (15%) also prefer equity but their value differs slightly (-0.22%) from the sample average, which is used for other sources than subsidised corporate loans (+0, 13% points). Within these enterprises this source came in second. Interestingly, the companies in this group are already bolder in terms of lending finance (+0.07% points) and non-subsidised loans (+ 0.17% points) than the sample companies. Similarly, it can be seen in the case of modern financing instruments, which have a stronger value than the average of the sample.

Own Capital to Credit - The Financial Practice of the Sme Project in Hungary

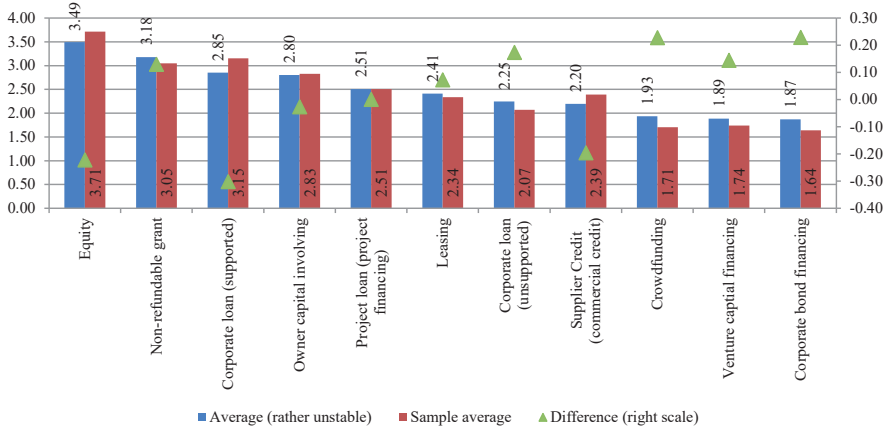


Figure 4. The structure of project funding sources according to the weighted opinions of the rather unstable enterprises (Source: own research, 2017, N = 416)

Enterprises that said they were more stable (40%) had very little difference in the average results of the sample. In almost every case, the sources received a slightly stronger evaluation than the average, especially for podium items. Leasing is even more important to them than in other groups. They also consider the novel sources anomalous, which is why they have assigned smaller values to them.

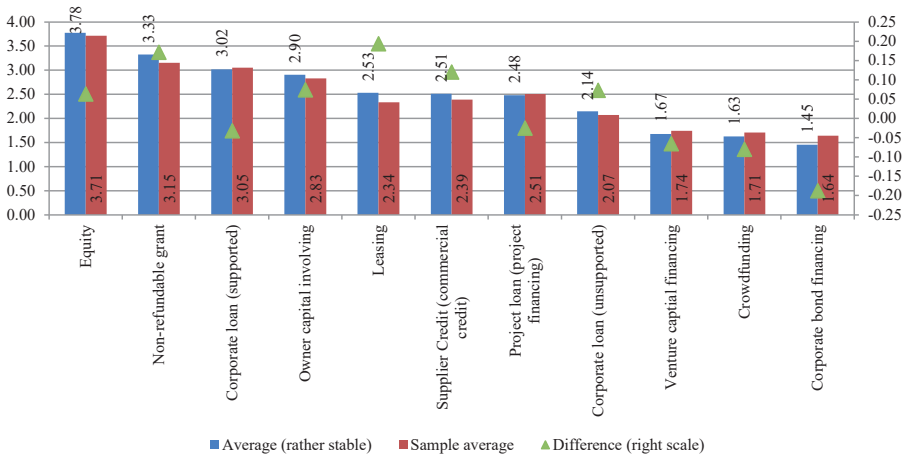


Figure 5. The structure of project funding sources according to the weighted opinions of the rather stable enterprises (Source: own research, 2017, N = 416)

Enterprises that say they were completely stable showed similar characteristics and values as the sample average. They are interested in the willingness to finance loans with greater courage. Project financing as a form of credit is more favoured on the basis of average values than a subsidised loan, although it is much more expensive and risky than a normal corporate loan. After project financing, supplier financing is also discussed with them, but with less value. Leasing is ranked behind.

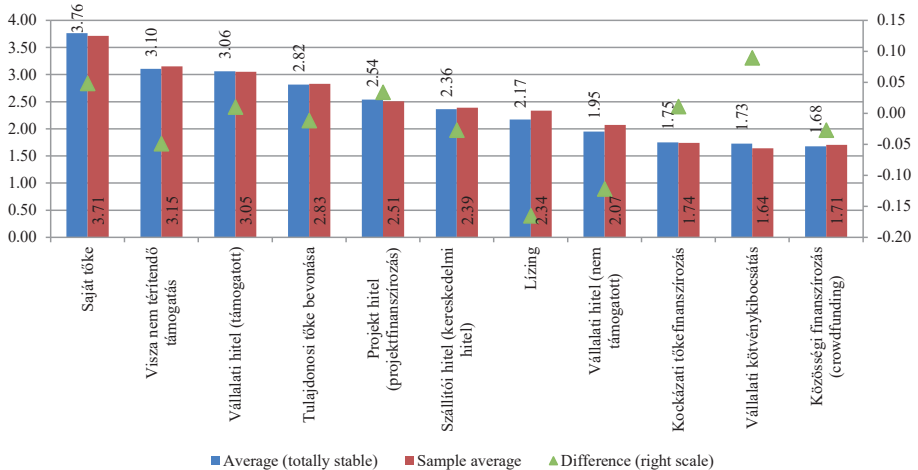


Figure 6. The structure of project funding sources according to the weighted opinions of the totally stable enterprises (Source: own research, 2017, N = 416)

Summary

Based on the above, it can be seen that more than 10 years after the crisis, Hungarian SMEs are still cautious about financing their projects. When it comes to a project, it is mostly based on one's own resources: a project can be started only if there is a source of in-house income. Another project-inducing factor are EU funds as well as subsidised loans, which are popular due to low financing costs. The lack of use of modern capital market instruments and the use of projects to finance projects can be traced back to the lack of financial literacy of businesses and their size. In this area, as in the development of individual financial knowledge and awareness, there is still room for improvement. The transfer of the methodological basis of project management, planning and financing can be the solution in which educational institutions, training institutions and organisations play a key role. The necessary expansion of knowledge within roadshows and professional events can be realised quickly and efficiently; the result of which can be even more successful, well managed and financed projects in the medium term.

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Bio-notes

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Energy Acquisition and Project Finance - Priorities in the Past and Nowadays

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Abstract

Project financing is a relatively new, yet special branch of financial instruments. It is an important financial tool for projects that can finance large-scale, strategic investments. High leverage is a preferred form of financing, as it can also be a source of expensive, cost-effective projects. Project investment is considered to be a priority area for energy investment, its strategic importance, its secure return and its stable price. The aim of this study is to examine the development of project financing globally and to the EMEA region, with particular emphasis on energy investments, including trends in recent years.

Keywords: *project financing, energy investments, energy demand, energy supply*

Introduction

The energy demand in the globalized world

Our accelerating world faces more and more complex challenges. The unprecedented digitization, the fourth industrial revolution and the evolution of technology require more and more energy. In addition to this, there is an increasing demand for productivity, the demands of the fast fashion industry, and the desire for prosperity, which can only be realized with increasing energy use. Carbon-based and carbon-free sources can cover the growing energy demand. However, it should be noted that carbon-free sources are also not entirely carbon-free, as the raw materials for their physical background are also produced by mining and carbon production.

Table 1. Grouping of energy sources (Source: own calculation, 2019)

Carbon-based energy sources	Carbon-free energy sources
Coal	Wind
Gas	Water (hydro)
Oil	Heat (geothermal)
Wood and other natural resources (biomass)	Solar (solar)
	Nuclear (atom)

According to the report of the International Energy Agency (2018), global electricity consumption may be more than a quarter by 2040 compared to the current value, which is supported by other reports. Emerging regions, including India and China, have a key role to play in this growth. The study by British Petrol (2019) outlines this trend. The worrying part of the process lies in the fact that the largest energy consumers want to cover the majority of their energy needs from conventional sources, with only a very little part dedicated to renewable and carbon free sources. If the scenario outlined is realized, the energy demand covered by carbon-based sources will give an even greater boost to the greenhouse effect.

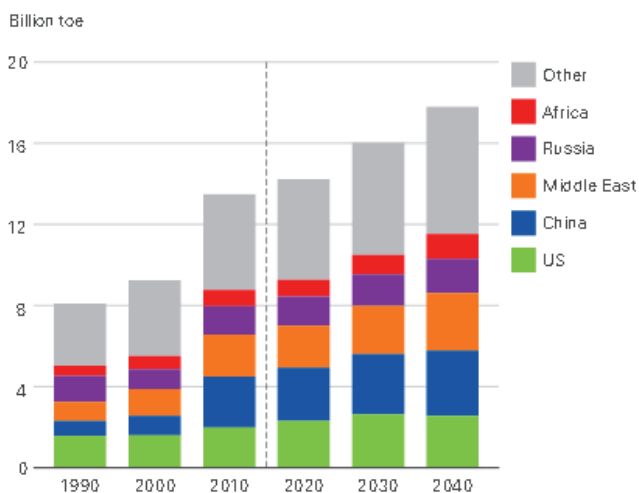


Figure 1. Primary energy consumption till 2040 (British Petrol, 2019)

The vision presented above is also supported by the summary of Portfolio (2014), which also compares the weight of the largest energy consumers in global energy consumption with their population. As you can see, there is a slight difference in energy consumption between China's population and its energy consumption. The same picture is much more contrasting for the US and the EU. The population-based energy consumption of welfare states is much higher than the proportional value of the population, which means that much more energy is wasted than would be justified. In the case of the USA, this is nearly three times higher, and in the case of the EU it is almost twice as high. The same applies to Russia.

However, India shows a rather opposite picture, in that it consumes much less energy than the population would be justified. However, with the break-up of India, this image will change, as there will be a further increase on energy demand. Consequently, the change of attitude in serving the energy demand is vital. It is unacceptable for this demand to be based on carbon-based resources in order to

maintain the viability of our land. In satisfying the need, more emphasis should be placed on carbon-free resource, which are not exclusively renewable. One must not forget the most reliable and most predictable nuclear power plants, which can produce many times more carbon-free renewable energy than other sources.

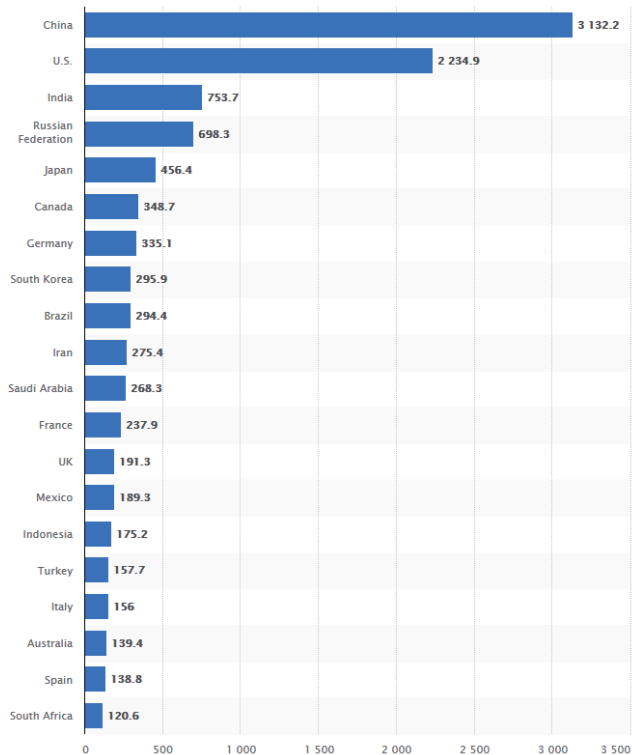


Figure 2. Top 20 countries in primary energy consumption in 2017, in million metric tonnes of oil equivalent (Statista, 2017)

As described above, it can be said that the energy sector is a prosperous sector, whether it is a traditional or renewable energy investment. It is therefore no coincidence that many investors have focused on marketable and increasingly demanding energy. Although investments are costly, they are limited by a number of technical parameters but there is always a guaranteed market for the finished products. Thus, it is an attractive field for financiers, which has led to project financing as a structured credit product. Between 2005 and 2015, energy investments doubled (Steffen, 2017) in spite of their very high cost. This provides evidence for what was described earlier.

1.2. Project financing as a financial supporter of large investments

Project financing, as a structural financial loan product, is different from the conventional loan products in terms of several dimensions. The point of this type of financing is best described by the following two standard studies by Newitt and Fabozzi (1997) and by Yescombe (2008):

- “The financing of a given economic entity, which is considered by the creditor as its cash flow and revenue, serves as the source to pay the credit back, its assets being the collateral.” (Newitt & Fabozzi, 1997)
- “Project financing is the method of long-term crediting of larger projects where the granting of loans is carried out entirely based on the cash-flow of the project.” (Yescombe, 2008)

Project finance, as a debt financing, is able to carry out large projects with high leverage. The priority areas of project financing are summarized by Fight (2006) as being:

- the energy sector,
- the oil and gas industries,
- mining,
- construction of motorways,
- telecommunication,
- other projects (paper production, chemical industry, construction of hospitals, schools, airports and prisons).

The financing of immovable property needs to be added to this list since it also represents a significant proportion within the market of project financing. Often, loans are so substantial that they cannot be financed by only one bank. A project that is not financed individually but collectively is said to receive a “syndicated loan”. Syndicated loans are such special loans where the money is provided by a group of two or more creditors in the form of a loan agreement. Syndicated lending is situated between the classic and the market-based lending. The loan providers are connected to each other on market terms and they raise the amount requested by the borrower as one single creditor.

Based on the abovementioned definitions, the inherent characteristics of project financing can be brought together as follows:

- it is given to an entity created for a specific project (SPV = Special Purpose Vehicle), which has a special economic and financial relationship with the sponsor/owner;
- funding is through employing high leverage (which can even be 80-90% in certain cases);
- due to the separate project company, the amount of the loan is not directly

charged to the balance sheet of the sponsor/owner and it does not have a negative effect on its creditworthiness;

- in the case of non-resource loans, the loan cannot be covered by the property of the sponsor/owner but only by the cash-flow of the project¹;
- the transaction is practically based on two main actors: the sponsor and the financial institutes, which are mainly the credit provider banks and the bond issuers;
- the provider of the loan capital does not become the owner of the project company;
- because of the above characteristics, the loan asset would have an incredibly high risk, and this risk can only be reduced by a competent and trained consultant basis.

From a corporate aspect, project financing is a form of funding with many advantages. It is definitely a benefit that it implies an off-balance-sheet financing with the use of exceptionally high leverage, as a result of which the borrowed large amount is not charged directly to the balance sheet of the project owner (because it only appears on the consolidated accounts). Hence, it will not degrade its creditworthiness (Yescombe, 2008) since the loan is granted to a project company created specifically for the project's purposes. According to Esty (2007), this legally independent entity established to carry out the project is funded through the equity given by one or more sponsors, and from other sources intended for the project. Moreover, the loan does not even have to be guaranteed by the owner of the project company since, in line with the agreement with the bank (Nádasdy et al., 2011), the transaction can either be a non-recourse or a limited recourse funding (obviously, sustaining the right of full recourse is also possible). Such credits are mostly covered by the signed contracts (including, but not limited to: independent contractor contracts, supplier contracts, sales contracts and management contracts)², pursuant to which the providers of funds are able to determine the relevance and justification of the project. It is another benefit that in most cases, project financing produces a better capital allocation than conventional corporate financing (John & John, 1991) because, due to the deeper monitoring and stricter terms it, by definition, filters out the uncertain or unjustified projects.

The reimbursement of the loans is ensured by the cash-flow derived from the operation of the project which removes further burdens from the shoulders of

- 1 Project financing can be divided into three main groups regarding the right of recourse:
 - non-recourse financing, where the sponsor/owner is not liable for the obligations of the project company;
 - full-recourse financing, where they take full responsibility;
 - limited-recourse financing, where the liability of the sponsor/owner is only limited.
- 2 There are guarantees other than contracts such as (including but not limited to) liens, rights to options, guarantee rights, commitments and various assignments.

the project owner, contrary to the conventional corporate financing. The banks participating in project financing – due to the large credit needs of the project and the major information asymmetry at the initial phase – usually grant the loans in a syndicate and not on their own, in view of the large exposure restrictions and the client risks. The lead arranger banks³ become internal participants in the project, because, along with the sponsors, they are present right from the early planning stage and would later involve the rest of the partners (banks) in the financing (Gatti et al., 2008). The lead arrangers can therefore have a better understanding of the background of the project and can familiarize themselves with the contracts on which they will base their financing decision. The loans – if they cannot cover the planned resources – can be supplemented by project bonds, while other forms of financing (lease financing, supplier financing, mezzanine financing) are tertiary in the course of the transaction. The creditors and funders must take into account the long-duration risk, the interest rate risk and the exchange rate risk, but the market- and operating risks have a significant effect too (Szalai, 2011). The bigger project financing transactions often cross the borders because of the volume, complexity and capital needs of the projects. Moreover, to ensure the informed decisions of the banks and to reduce the risks they face, it is necessary to involve external consultants as well, who can be (inter alia) legal, financial, sectoral or insurance experts (Kónya, 2009). These consultants (provided that the project itself has international aspects too) are employees of bigger international consultancy firms with years of experience in similar projects⁴.

Project financing, just like any other kind of financing, can only be successful in countries where the economy is transparent, the contracts are respected and where one does not have to expect market failures that could potentially upset the budget balance or even cancel the project (Ahmed, 1999).

Material and Method

Our secondary research was based on the annual data tables issued and maintained by Project Finance International, operated by Thomson Reuters. In terms of data, the data of the last five years that were closed in 2014-2018 was analysed, thus eliminating the distorting effect of the crisis and the ensuing downturn. The total project funding values from the data using nominal values, distributions, and chain and base ratios are intended to be analysed. The PFI data tables collect and analyse the data of all relevant project financing areas by region but within the framework of this study, only the EMEA area, including energy, oil and gas projects were focused upon.

3 The lead arranger financial institutes are called MLAs (Mandated Lead Arranger) but the names 'lead bank', 'lead arranger', or 'lead manager' are also widely used.

4 There are legal and financial consultants in every project financing case. Without them, the transaction cannot go forward at all or only with a huge risk.

Results

Project financing as a form of credit is a special type of loan tailored to large-scale investments. Project funding is sensitive to the world's financial movements because of its high cost requirements, high interest costs and long payback times. The risk-sensitivity of financiers in many cases, in turn, encourages them to restrain their placement activities in order to achieve the highest profit. If they can put other types of credit at a lower risk, with a shorter return, then they group their resources there. Global project financing volume has also been very hectic over the past five years. In 2015 and 2016, a 15% drop was observed, followed by another 3% drop in 2017 compared to the previous year. The reason for this is the downturn in global economic activity and the impact of the South American crisis. By 2018, the value rose by 23%, driven by the growth in global demand. This image is also displayed in terms of base ratios. Based on 2014, there is a 7% drop in those years, followed by a 12% drop, which can be seen as a major downturn at global level. In 2018, the volume was only 8% higher than the base value.

The situation in the EMEA region is similar but still more hectic. Compared to the previous year, it also showed an increase in 2015 and 2016 but in 2017, there was a decline of nearly 30% due to the economic and social crisis in the Middle East and in Africa. Financiers avoid troubled areas even if there are many resources available. Due to the economic and political risks of project financing, the regions are considered as a target to be avoided due to insufficient level of collateral. Compared to the base year, significant increases can be seen in the examined years (14% and 30%) until 2017, where the financing volume of the EMEA region accounted for 89% of the 2014 value. This region had already set for the following year but it was only able to go up to the 2015 level.

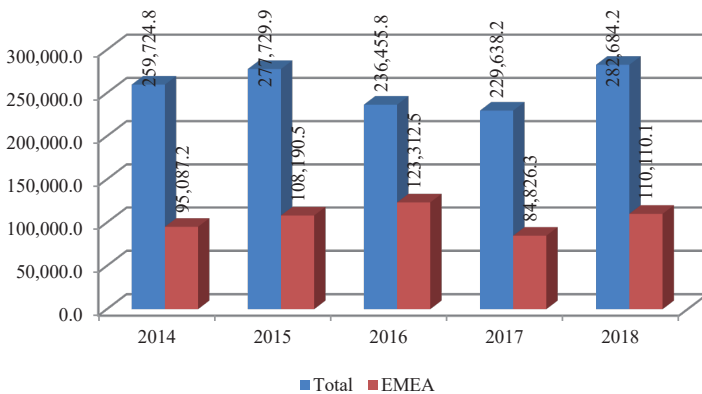


Figure 3. The total project financing volume at global level and in the EMEA region, million USD
(Source: own compilation, based on Project Finance International, 2015-2019)

The financing of energy projects shall now be examined in detail. Although the global and EMEA project funding volume in all areas was hectic in the years under review, project finance for energy investments has progressed steadily. The area was able to grow every year (27, 4, 11 and 12%), which is also the case with base values. Based on the base value, the weight of the energy sector is even more prominent. Compared to 2014, it was able to grow by 27%, 33%, 47% and 65% year-on-year, that is, the global project finance volume of the global energy sector closed at 165% at the end of the five-year period under review. The trend shown supports the findings in the literature that the increase in energy demand induces marketable investments.

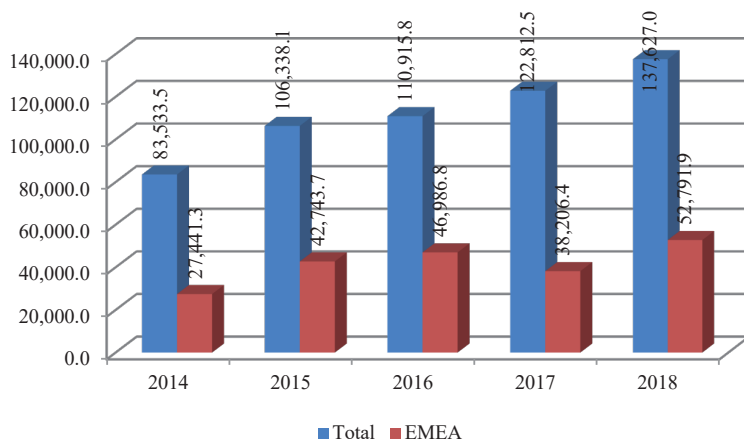


Figure 4. The total value of energy project financing at global level and in the EMEA region, million USD (Source: own compilation, based on Project Finance International, 2015-2019)

It is worth taking a look at the proportion of project-financed energy investments within the total project funding value. The proportional role of the area can also be seen on the basis of the proportions as they (based on the values of recent years) account for almost half of the global value (more than half in 2017). Within the global value, there is a clear upward trend up to 2017, which is not the case for the EMEA region. The rate is also lower and growth is slower, but there are clearly high energy investments here as well.

Energy Acquisition and Project Finance - Priorities in the Past and Nowadays

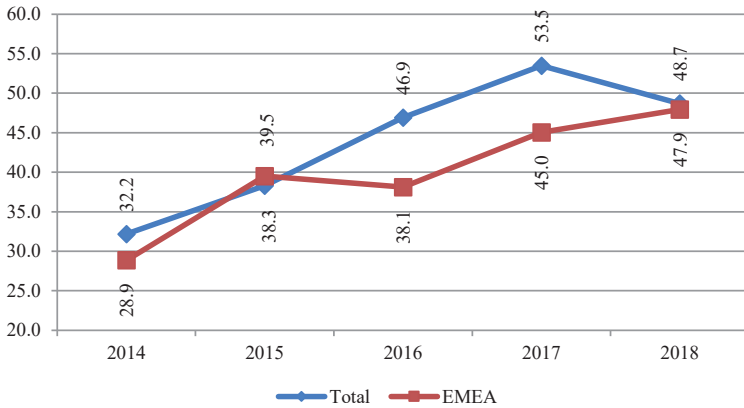


Figure 5. Share of energy project financing in total project financing at global level and in the EMEA region, % (Source: own compilation, based on Project Finance International, 2015-2019)

Summary

If the project financing of energy-producing areas as a whole is discerned, it can be said that it is clearly a target area that is perfectly illustrated by the millions of dollars pumped by financiers to one of the areas. Increasing and growing energy demand also requires more energy generating units, so the return on projects is practically guaranteed. The EMEA region, which also includes Europe, accounts for nearly 40% of the global project funding, which is why it is definitely worthy of attention. Energy and oil and gas investments with a solid return will remain high on the agenda in the future, so it is likely that many more investors will be attracted outside the banks. For the credit syndicates, the terrain is secured; it is up to the consumer to reduce or increase energy consumption. Innovative technologies can help a lot but the best thing is to be self-restrained because unused energy is the best energy.

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Bio-notes

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Developing Critical Reading Skills: A Coursebook Evaluation Study

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Abstract

The aim of the paper is to discuss the importance of teaching critical reading skills, particularly in a foreign language context. The paper consists of two parts: theoretical and empirical. In the first part, the theoretical considerations underpinning this aspect of reading are discussed. Two theoretical perspectives are focused on: a psycholinguistic-cognitive orientation, which views reading as a mental process during which the reader constructs their own representation of the text and a socio-cultural orientation, which emphasizes the importance of varied social and historical contexts in text production and text reception. Within each theory, practical possibilities on how to develop critical reading skills are explored. The practical part of the article presents the results of a small-scale coursebook evaluation study, whose main aim was to examine to what extent the *Pioneer Plus* coursebooks can help learners develop critical reading skills. The results of the study point to didactic materials and teaching activities that have the potential to facilitate this important component of language proficiency.

Keywords: *critical reading, coursebook evaluation, teaching instruction.*

Reading skills in a psycholinguistic perspective

Although various approaches to reading have been developed, in my opinion there are two perspectives that have exerted the most impact on both theoretical discussions and practical implications concerning reading: the psycholinguistic perspective and the sociocultural one. In a psycholinguistic perspective, reading is viewed as a cognitive process, a set of mental operations which allow the reader to create their own representation of a text. In theory and empirical research, two levels of cognitive processing are usually distinguished: “lower” – which focuses on letter identification, word recognition and syntactic parsing; and “higher” – which involves discourse processing and activating the reader’s knowledge about the topic of the text and their knowledge of text characteristics. It is the higher level of processing that enables the reader to construct their representation of the text; in other words, to comprehend the text. A good example of this theoretical perspective is the model

of van Dijk and Kintsch (1983), according to which information drawn from the text is represented in the reader's memory at three levels: surface form, propositional textbase and situation model. The surface form processing results in understanding words and sentences in the text; the propositional textbase processing enables the reader to reach a literal level of understanding the text while developing the situation model facilitates constructing the reader's individual evaluation and interpretation of the text. At this point of our discussion, it seems useful to refer to Urquart and Wier (1998) who distinguish two products of understanding the text: comprehension (which would correspond to the propositional textbase) and interpretation (which would correspond to the situation model).

The main focus of psycholinguistic studies is the reader and the way they construct a representation of the text in their mind. The following have been the center of investigation: the role of schemata, later conceptualized as background knowledge (e.g. Anderson, 1978; Carrell, 1983; Clapham, 1996; Liu et al., 2009), metacognition (e.g. Carrell, 1989; Kusiak, 2001) and strategies that readers apply to construct their representation of the text (e.g. Kusiak, 2013). Psycholinguistic models offer important implications for teachers. Educators are advised to raise learners' metacognitive awareness concerning their knowledge of themselves as readers and provide students with a suitable strategy training. A useful aim in reading instruction is developing the readers' background knowledge about the text being read; this can enhance the cognitive processes involved in comprehending the text. Both aims - activating readers' background knowledge and raising their metacognitive awareness - are important elements in teaching critical reading skills.

Reading skills in a socio-cultural perspective

According to the principles of a socio-cultural perspective, "texts are primarily socially constructed" (Johns, 1997, p.3), which makes the role of the reader more complex than the psycholinguistic perspective suggests. Reading the text does not only involve applying appropriate strategies, drawing on one's background knowledge and being aware of one's cognitive efforts. A successful reader should identify a model reader of the text and understand the implied message shared by the members of the social group to whom the text is addressed. They should be ready to respond to the text in a culturally specific way. In their creation of comprehension of text, they should take into account not only the information expressed in the text and their own background knowledge but also the historical and social factors that could have influenced the writing process of the text. A good example of approaching texts in this manner is presented in McCormick's (1997) social-cultural model of reading where reading is presented as a cognitive activity that occurs in social contexts. Reading is an interaction between the ideology of the reader and that of the text. Both the text and the reader have their general

and literary repertoires which are derived from their society's literary and general ideologies. In the reading situation, an intersection of repertoires occurs. It may happen that the reader will deliberately choose to read "against the grain of the reading that the text seems to privilege" (McCormick & Waller, 1987, abstract), which will enable them to explore the differences between their repertoire and that of the text.

Studies on text production and comprehension influenced by the socio-cognitive perspective focus on the socially constructed nature of the reader (McCormick, 1997; Smagorinsky, 2015), on writing as a socio-cognitive process of knowledge construction (Zalewski, 2004) and on critical reading in FL education (Wallace, 2005). As regards teaching, socio-cultural perspectives advocate developing critical reading skills in students. It is important to raise the readers' awareness of the nature of their understanding, which, following Urquhart's (1987) terminology, should be named interpretation.

Critical reading

There are a number of aims that both L1 and FL/L2 education plan to achieve in the area of reading. Recently, the attention of reading instruction has been directed to critical reading as a skill that is indispensable in a contemporary globalized world. It is useful to discuss critical reading skills in the light of the critical language awareness (CLA) approach developed by Fairclough (1989). Drawing on this approach, Clark (1995) suggests extending the concept of background knowledge, traditionally viewed as the learner's world knowledge. The use of background knowledge involves also an awareness of the ideological nature of reading and of the social process of production and interpretation of texts, the factors emphasized in a socio-cultural view of reading. It means that when interacting with a text, the reader has a richer repertoire – they can draw on their general knowledge of the world, the knowledge of other texts that the particular text brings in as well as on their world view, i.e. ideology.

As regards instruction, scholars such as Clark (1995), McCormick (1997) and Johns (1997) suggest that the teacher should not only activate the reader's background knowledge but also facilitate their awareness of their reactions to the text. Raising the reader's metacognitive awareness, emphasized in psycholinguistic theories of reading, does not only involve the awareness of one's strategies applied in reading. The reader should be aware of their own beliefs, standpoints and cultural values activated during their reading. Clark (1995) argues: "You read differently when you agree, when you subconsciously disagree and when you consciously agree" (p. 69). The reader should be also aware of "reader positioning" or the way in which the writer attempts to influence the reader. A good example is the use of the pronoun "we" by the author of the text in order to establish a shared viewpoint between

the reader and the writer. Another ability important in critical reading instruction is raising the learners' awareness of their social role as readers. Texts are directed, often implicitly, to members of social groups determined by factors such as gender, social class or nationality. Critical readers should know how to "explore the ways in which a specific readership is written into the text" (Wallace, 1993, p.111). Another important aim of teaching to read with a critical eye is to make learners realize that as critical readers, they should be prepared to take control over and responsibility for their own reading, which can mean being aware of the consequences of decisions that the reader can make in relation to their interpretation (as emphasized by McCormick, 1997 and Johns, 1997). Being critical is particularly important for FL readers as "they may be disadvantaged in interaction with a text in a foreign language, not so much because of inadequate linguistic or schematic knowledge but because of an over-deferential stance towards the text" (Wallace, 1993, p.103).

Critical reading is often considered to be the most advanced level of reading. Dechant (1991) calls critical reading "evaluative comprehension" and views this type of reading as the one that involves the higher order cognitive processes of analysis, synthesis and evaluation. Dechant (1991) claims that "critical readers are as much interested in why something is said as in what is said" (p. 454). Therefore, the scholar underlines the importance of sensitizing learners to the language of the text. Paying attention to how words are used enables readers to recognize oversimplification, overgeneralization, inaccuracy and distortion in the text. Wallace (1993) and McCormick (1997) suggest that critical readers should act as interrogators or detectives of texts and of their reactions to reading. They think that one of the most effective technique of teaching critical reading is to instruct learners to ask questions while reading.

To sum up, developing critical reading skills seems an important part of reading instruction, especially the one directed to more advanced learners. This type of reading is a prerequisite for successful participation in contemporary social life, where reading printed and online texts is an everyday activity. Although the value of critical reading has been recognized in literature and critical reading has become a subject of many reading studies (e.g. Skopinskaja, 2011; Kaura & Sidhub, 2013; Weninger & Kan, 2013), I think it is still a neglected skill which deserves more attention in school instruction. The evaluation of how critical reading skills are practiced in a school setting is the focus of the next section of the paper.

Critical reading – a coursebook evaluation study

Aims of the evaluation

I present hereunder the results of the evaluation of a series of four coursebooks published in 2019 by MM Publications, meant to be used in teaching English as a foreign language in Polish secondary schools: *Pioneer Plus Elementary*, *Pioneer*

Plus Pre-Intermediate, *Pioneer Plus Intermediate B1* and *Pioneer Plus B1+*. All the components were written in accordance with the specifications suggested by *The Common European Framework for Languages* (Council of Europe, 2001) and *The Core Curriculum* (MEN, 2018), the document produced by the Polish Ministry of Education.

The main aims of the evaluation were to answer the following questions:

- Is it possible to develop critical reading skills in learners when teaching from the *Pioneer Plus* coursebooks?
- What materials and what tasks are provided in the books to teach critical reading skills?

The analysis of the coursebooks

First examined were the types of texts provided to learners to develop reading skills and the types of tasks that accompany the texts. Then, the potential of texts and tasks in facilitating critical reading skills was evaluated.

The analysis revealed that the books provide a variety of texts. The following are the most common: signs, blogs, internet advertisements, extracts from adapted versions of novels, science texts, online reviews of products, emails, online quizzes, dialogues, dictionary entries, comic strips, flyers, tickets and receipts, maps, web pages, customer reviews and magazine articles. In my opinion, familiarizing foreign language learners with such a rich a variety of texts gives learners a good introduction to reading authentic texts in real life. It can show learners that different texts are written for different purposes and by different authors. Developing this sensitivity will undoubtedly prepare learners to read texts with a critical eye, as suggested by the socio-cultural perspectives to reading.

As regards types of reading tasks, three types of tasks were identified: tasks that students do before reading the text (pre-reading tasks), tasks that learners complete when reading the text (while-reading tasks) and tasks in which students are engaged after they have read the text (post-reading tasks). Let us first look at the while-reading tasks provided in the coursebook series. The most common tasks of this type are answering open ended questions, matching headings with parts of the text, True/False statements, putting parts of the text in the right order and completing the gaps with the words provided. The skills that students should develop when completing these tasks, as specified by the authors of the coursebooks at the beginning of each unit, are skimming (reading for the gist), scanning and reading for specific information. It is worth underlying that in the coursebooks for B1 and B1+ learners, tasks directly connected with developing critical reading skills also appear. These are: identifying the intention of the writer, drawing conclusions on the basis of the information presented in the text, identifying the purpose of the text, guessing

the source and type of text. Another important element of reading sections are *TIPS* boxes, in which advice concerning effective reading strategies is offered, also the one that can help students to become critical readers. For example, in *Pioneer Plus B1+*, learners are instructed on how to read between the lines and thus interpret what the author wants to convey although it is not explicitly stated.

Pre-reading and post-reading activities also lend themselves to making critical reading the focus of instruction. In the coursebooks analysed, the most popular pre- and post-reading tasks are open ended questions. In most cases, students should discuss the questions in pairs / groups; sometimes the questions are meant for individual reflection, without engaging learners in any discussions. The questions are of two types: questions that allow personalization, which means asking learners to relate the issue that is discussed in the text to their life and general questions, which elicit the learners' opinions about issues that are connected with the topic of the text. An example of a personalization task is the one provided in *Pioneer Plus Elementary* on p. 32. Before students read the website of the Superfit Club, they are asked to discuss the following questions: *Do you like exercising? Are you a member of a gym?* An example of the other type of a pre-reading task is asking students a general question: *Do you think money will exist in the future? If not, why?* (*Pioneer Plus B1+*, p. 62) before they read an extract from an adapted version of *The Sleeper Awakes* by H.G.Wells.

Let us look at several examples of how the pre- and post-reading tasks provided in the coursebook series can contribute to developing critical reading skills. In *Pioneer Plus B1+*, unit 1a, p. 8, students read texts in which people describe their jobs. The pre-reading questions require learners to answer two questions: *Why do people work? What factors contribute to job satisfaction?* The questions invite students to think about their personal opinions and then share them with their peers. They help students reflect on everyday issues and then compare their thoughts with the opinions expressed in the text. This reflection is likely to make readers realize that their point of view can influence their evaluation of the text (i.e. their interpretation of the text, as specified by the psycholinguistic perspective on reading). As examples of post-reading questions, let us discuss two tasks. The first is taken from *Pioneer Plus B1+*, unit 8b, p. 99. After reading the text about bullying, students answer the question: *Did the text affect the way you see bullying? Why?* A similar type of question is suggested in *Pioneer Plus Intermediate B1*, unit 9a, p. 88. After reading the text concerning making decisions, learners discuss the questions: *Do you agree with the information presented in the text? Do you think you will change the way you make decisions from now on?* In both cases, the questions ask readers to think about their reactions to the text, which reflects the principles of the sociocultural perspective on reading. This activity can raise learners' awareness about a possible influence of the text on the reader. An additional exercise could be to instruct students to think about what aspects of the text could have had an impact on their opinions.

The other example of post-reading question to be discussed here is the one suggested in *Pioneer Plus B1+*, unit 9a, p. 105. After the text “Prevention is better than cure”, students are asked to discuss the following: *What health issues are there in your country? Who is responsible for health issues: the individual, the state, or is it an international responsibility?* Reflection on such questions encourages students to think more deeply about the issue presented in the text by relating the issue to one’s country, thereby facilitating students’ intercultural awareness. It may also stimulate learners to search for new information on the internet or in some other sources. I believe that both intercultural awareness and the ability to find information, are important components of the critical reader’s competence.

To conclude, it seems that *the Pioneer Plus* series offers questions that can be very useful in teaching learners how to approach a text in a critical way. The questions that students are asked to answer before they read the text help them to see the issue presented in the text in a wider, more general context and to notice different aspects of the topic besides the one discussed in the text. Questions asked at the post-reading stage encourage readers to reflect on how the topic is presented and invite students to evaluate their own understanding of the text.

Conclusion

The analysis revealed that the coursebooks analyzed in the present study provide teachers with materials that can be helpful in teaching critical reading to foreign language learners. The most useful aspects of the coursebooks are a variety of authentic texts and reading tasks offered in the reading sections. The number of activities is not very impressive but may be considered sufficient if the teacher is prepared to supplement the coursebook with additional texts and with their own ideas. There are some universal questions that the teacher can ask in reference to almost every text. Kress (1985 as cited in Wallace, 1993, p.114) suggests the following general questions:

- How is the topic being written about?
- Why is the topic being written about?
- What other ways of writing about the topic are there?

The following questions may explore the readers’ reactions to the text:

- Is there anything that the text wants me to do?
- Do I agree with what the text wants me to do?
- Can I argue with it?
- Are the issues it raises the ones I think are important?
- Are the assumptions behind those issues the ones I share?
- What are the implications of reading with or against the grain of this text?

Another useful activity could be comparing two or more texts that discuss the same issue (or the same event) in terms of their presentation of the topic and the use of language. A good idea can be to encourage learners to look for such texts and present them in class. More advanced learners should practice reading and evaluating on-line texts. It is crucial that both the teacher and the learners realize that a critical approach to the text does not only entail extracting information from the text but it also requires the reader's reflection on its content, on the author and on one's role in the whole reading situation.

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Bio-note

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OAR@UM and Open Access in Malta: Five Years On

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Abstract

The paper looks at the development of Open Access (OA) in the smallest EU member state of Malta over the course of the past five years. Aside from providing a chronological overview of key activities undertaken within the above specified period with the goal of putting the underlying theoretical principles of OA into practice, it places an emphasis on OAR@UM, the University of Malta (UM) Institutional Repository (IR) as the backbone of OA in Maltese Islands. The paper provides a direct link between the technological expansion of the IR and its growing importance to the local and worldwide academic community, while pinpointing and discussing the key aspects of its success and identifying the possible future course of local OA solutions.

Keywords: *Open Access, Institutional Repositories, OAR@UM.*

Introduction

Open Access (OA) is considered to be one of the six main pillars of Open Science (OS) - a practice whose sole purpose is to make every kind of scientific and research information available in a free and unrestricted form to all interested parties, ranging from an inquiring amateur to an established professional seeking to change the status quo in a particular field (Kasberger, 2013). Whereas the history of OS can be traced back as far as the advent of an academic journal in mid-17th Century, OA is a much younger concept in comparison. Its early origins are firmly intertwined with the emergence of the Internet within the academic sphere in the 1970s when the computer scientists began self-archiving (and in doing so effectively disseminating) their works using anonymous File Transfer Protocol (FTP) archives. The last two decades of the 20th Century and the beginning of the new millennium saw a widespread adoption of the core principle of OA - providing free and unrestricted access to the research literature - and its division into two primary forms: Gold OA and Green OA. In case of the former, the vehicle for the OA is the journal itself, produced by a commercial publisher or sponsored by a third party such as a research institution or a fund, whereas the latter requires the author to

self-archive their work in an institutional or subject repository upon publication (or acceptance for publication) in a conventional, pay-per-access journal to achieve the desired unfettered access and visibility (Suber, 2012).

The history of OA in the Maltese Islands is inadvertently tied to OAR@UM, the University of Malta's Institutional Repository (IR). Prior to its launch in September 2014, certain efforts at adopting OA could be observed - some academics self-archived their published as well as unpublished work on their personal websites, or published in prominent Open Access journals, and even a considerable number of local scientific journals, such as Xjenza, International Journal of Emotional Education, Malta Medical Journal, or Journal of the Malta College of Pharmacy Practice, offered their full text content online for free - however, these efforts were principally isolated, lacking institutional structure and oversight. This meant that the bulk of the research outputs produced under the auspices of the UM was available either through subscription-based databases, print journals and monographs, and materials in the UM Library's Melitensia Collection, or not at all.

Over the course of the following five years (2014 - 2019), many of these materials have been deposited in OAR@UM. The IR itself underwent a significant expansion, both in terms of a variety of content which includes research papers, dissertations, conference proceedings, audio files, and many more, and technology, being integrated with international structures and improving its features via the latest software upgrade. The following text aims to provide a brief chronological account of the key milestones in the five-year evolution, along with a detailed overview of OAR@UM, and more importantly, to discuss its value for Maltese academia and identify the key aspects of its success.

Key milestones

If we consider the implementation of OAR@UM as the starting point of the *official* history of OA in Malta, it is important to briefly explain the circumstances under which this was accomplished. As the single highest education institution in the country, the UM faced two considerable challenges when preparing a solution that would abide by the OA principles, not only at the institutional level, but also - given the unique characteristics of Malta - a national scale. First was the fact that by 2014, when the discussions pertaining to adopting an OA solution were under way, there had already been a considerable amount of already published research outputs in need of dissemination; while the second obstacle lied in the lack of available funding. Taking this into account, a decision was drawn to create an IR, following the examples of numerous foreign institutions.

Ahead of the implementation stage, the UM Library conducted an institution-wide survey in order to ascertain the local academics' attitude towards OA in general as well as their opinion in regard to having an IR at the UM. The responses,

collected from 408 participants (which at the time represented nearly half of all academics), showed that the majority was not only in favor of OA ideology and the IR, but also greatly interested in depositing their publications in it. Moreover, the majority of respondents declared interest in doing this themselves, via a self-deposit, as opposed to seeking assistance with the procedure from the Library staff.

Having obtained such optimistic results, the UM Library proceeded with launching the IR, branded OAR@UoM, in September 2014 (it was later renamed to OAR@UM following the rebranding of the UM), utilising an open source repository software package DSpace (version 4.1).

The first event of national importance pertaining to Open Access and Open Access Publishing was *Open Access and its Impact on Research and Scholarship* - a conference hosted by the UM Library, in collaboration with organising teams from the EU-funded FOSTER (Facilitate Open Science Training for European Research) project, in May 2015. Apart from promoting OAR@UM and encouraging the local academics to deposit their publications, the rich conference programme also addressed issues such as Open Science and Citizen Science, and underlined the benefits of OA for the dissemination of research.

In order to put more emphasis on OA and to tackle the growing number of publications awaiting deposit in OAR@UM, the UM Library Management created a brand-new department at the Main Library in January 2017: the Open Science Department (OSD). The department is responsible for promoting OS, supporting the processing and uploading of research output on OAR@UM, and providing support and advice on copyright clearance, licenses, embargo periods, and any other issues pertaining to OA publishing. To this end, the OSD established close relations with other UM bodies, including the UM Legal Office and UM Knowledge Transfer Office.

Concurrently with the launch of the OSD, works were under way to develop an official OA policy for the UM which would provide precise definitions of all terminology related to OA, and clearly identify the responsibilities of each stakeholder involved, including the UM, the individual academics, and the UM Library. Furthermore, the policy would also tackle copyright issues, waiver periods, and embargo options. Initially, the UM planned to implement the policy with a deposit mandate - as defined by Suber (2012) - making it obligatory for academics to deposit a copy of their paper in OAR@UM upon acceptance for publication; however, after receiving critical feedback, it was eventually put into effect in late summer 2017 as an encouragement policy.

In January 2018, the UM Library hosted another national workshop, entitled *Open Access in Practice: Dissemination, Visibility, Usage and Impact of Scholarly Research*. The workshop was organised in collaboration with OpenAIRE, a pan-European project aimed at supporting the implementation of OA policies across EU member states, and featured both local and foreign speakers, who addressed a wide variety of issues, including research data management, data sharing, OS in context of innovation, and more. A particular emphasis was put on UM's OA Policy and its

alignment with OpenAIRE. The event was successful in promoting OA and OAR@UM and attracting more Maltese researchers to contribute to the repository.

Lastly, in June 2019, OAR@UM itself underwent a technical upgrade from its initial version 4.1 to the latest released stable version 6.3. The new release introduced not only an improved, more intuitive user interface, but also better compatibility with the UM website, advanced navigability, enhanced bibliographic description and new functionalities.

The expansion of OAR@UM and its importance to the Maltese academic community

Over the course of its five-year existence, OAR@UM has amassed a significant number of different materials. As of 31st July 2019, its collection consisted of 38,448 items, out of which 15,085 were articles (the most prevalent type of material in OAR@UM), 9,732 dissertations, 2,106 conference objects, and 558 books. 22,658 out of these items were made available in OA, ensuring the worldwide visibility of both the metadata and the full text, which represents 59 percent of their total amount. The total number of contributing authors reached 29,934.

Aside from its massive quantitative growth, OAR@UM also drastically improved in terms of the variety of materials which directly increased its significance and relevance for different groups of users. The addition of a collection dedicated to Maltese journals allowed their publishers to archive their content in an environment substantially more stable, reliable, and versatile than either their original paper setting or a basic website. In fact, the Maltese journal collection currently features a total of 67 titles, including prominent publications across the fields such as Xjenza, Malta Medical Journal, Antae, Melita Historica, and many more. Owing to the established agreements with the editors, the latest issues are added within a very short period of time after their publication, greatly enhancing their impact and readership.

Furthermore, OAR@UM features several sub-communities and collections dedicated to accommodating digitised items from the Library's Melitensia department and Fine Arts collection, including valuable donations, as well as documents specific to the cultural heritage. This elevates the role and importance of OAR@UM far above that of a simple IR, making it a platform suitable for preserving national digital heritage. As an example, we can mention the vast collection of the UM School of Performing Arts which holds digitised documents and ephemera related to the history of performing arts in Malta.

One of the key characteristics of the OAR@UM platform is transparency. The entire content of the repository is indexed by the library discovery system HyDi as well as commercial search engines such as Google and Google Scholar, ensuring its discoverability by not only the UM's staff and students but every interested party,

regardless of their affiliation or location. Moreover, OAR@UM serves as a data provider for the Open Archives Initiative (OAI) Service providers, specialized OA tools/web-based platforms that employ the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) to gather metadata records of primary items from various repositories, archives, and data storages. The metadata is subsequently used as a basis for a central, fully-searchable database, equipped with a wide array of additional functionalities, which allows for a better, more complex research experience on the side of the end-user, while simultaneously increasing the visibility and impact of the authors and their work.

As of now, OAR@UM is integrated with three OAI Service Providers which are also considered to be the most voluminous and successful: the OpenAIRE portal, BASE: Bielefeld Academic Search Engine, and CORE: Connecting Repositories. It is interesting to note that while the OpenAIRE portal and BASE harvest only the metadata - in case of the latter it is even the entire metadata content of OAR@UM, updated on a weekly basis - CORE actually also collects the associated full text files, which expands the above mentioned benefits for all interested parties even further (Knoth & Zdrahal, 2012).

The above listed characteristics clearly demonstrate the value OAR@UM brings to the Maltese academia as well as the general public. For the end-users, the IR represents an invaluable resource, which - unlike the vast majority of resources available at the UM and research institutions in general - is fully independent of licensing agreements and subscriptions, lending itself to an immediate and indiscriminate use. Furthermore, it brings forth a bulk of information that would otherwise remain invisible and inaccessible: the unpublished, grey literature. When it comes to authors and creators, on an individual level, the researchers can benefit from enhanced visibility and an increase in the number of citations of their work, better chances of establishing collaborations with colleagues in the same scientific area, and the long-term preservation of deposited materials. On an institutional level, the presence of the repository elevates the international prestige of the UM, and has a proven direct positive impact on its position in the Webometrics World Ranking of Universities. In fact, over the course of the latest five-year period, the UM moved from 1257th position (July 2014) up to 866th place (July 2019), largely due to the OAR@UM's growth (Cybermetrics Lab, 2004).

Discussion

Whilst focusing on OAR@UM as the primary vehicle for OA, it is important to identify the key elements of its success in the local settings.

It comes as no surprise that one of the critical aspects is the technical side of the IR. OAR@UM utilises DSpace which is a highly versatile and customizable software solution, allowing for an easy back-end management (creating communities, sub-

communities and collections, amending metadata records, moving items between collections, etc.) even for librarians who do not possess advanced IT and programming skills, and quick and streamlined depositing process for anyone involved in the uploading of materials. Furthermore, DuraSpace - the developer for DSpace - provides a variety of supporting materials, including a wiki featuring frameworks and detailed documentation regarding the implementation and maintenance of the IR, and a public forum that gives the experts from all corners of the world the opportunity to discuss the newest technical issues and the institutional users the chance to reach out for assistance.

Promotion and marketing need to be emphasized as the next, equally indispensable aspect of OAR@UM's success throughout the years. Aside from the one-off events, such as the aforementioned national workshops, the Library participates in an international Open Access Week, a global event which takes place on an annual basis in October. The Open Access Week features lectures and workshops delivered by both local and foreign experts that target specific aspects of OA, OS and OA publishing, and ultimately serves to raise awareness of the subjects among the local academics. Moreover, since its conception at the beginning of 2017, the OSD has been publishing a monthly newsletter *OAR@UM Update* featuring up-to-date quantitative data that document the IR's growth as well as pertinent information related to OA and academic publishing, including tools such as Google Scholar Author Profile, ORCID identifier, Sherpa/RoMEO database, and more. Information pertaining to the newest additions to the OAR@UM's collections and a separate section entitled *Open Access Fact of the Month*, both created by the OSD, also form part of the UM Library newsletter *Newspoint Extra* which is similarly released every month.

As a part of the promotional activities, the regular OAR@UM workshops, organised in collaboration by the Library's OSD and the Outreach Department, need to be mentioned as well. The training sessions that take place on a group or individual basis are divided into two parts: the first serves as a brief theoretical introduction into OA and OA publishing, defining the fundamental terminology and outlining the contemporary situation in Malta, while the second provides an in-depth look at the front end of OAR@UM, along with step-by-step instruction on the depositing process.

Last but not least, the success of OAR@UM as an OA solution is irrevocably dependent on the cooperation of academics themselves. The collective attitude toward OAR@UM remains positive and more and more academics are coming on board with the idea of having their work available in OA, as demonstrated by an internal inquiry which is being carried out by the OSD; however, it is interesting to note that the personal involvement in the initiative is still fairly low. Whereas there is a considerable number of researchers who are very active and upload research papers on a regular basis via self-deposit, passivity prevails with the great majority of them. On the other hand, when asked by the UM Librarians to grant permission

to upload research papers on their behalf, a 100% feedback has been received so far, with the academics forwarding the requested soft copies or allowing for a download from their ResearchGate profiles.

It is safe to say that over the course of the past five years, thanks to its quantitative and qualitative growth, OAR@UM has contributed significantly to turning the OA principles from theory to practice, not only at the institutional level, but also on a national scale. The work is, however, far from over as there are several areas that lend themselves to improvement. Firstly, whilst having an official OA Policy in place goes a long way in helping to populate OAR@UM and in doing so, elevating the position of the UM in the world, the fact is that policy cannot guarantee the deposit of every single work published under the auspices of UM on account of it being merely a soft, encouragement type of document. Secondly, despite all its technological advantages and the recent upgrade, OAR@UM is not, in fact, yet well integrated with major services offered by both the UM and third parties, such as RefWorks, the bibliographic management software, the UM directory profile, or social media. Thirdly, the Open Data are so far not accepted for inclusion in OAR@UM.

As for the future, the projects tackling some of the above listed issues, including the inclusion of Open Data and improving the integration of OAR@UM with the UM services as well as registering the repository with more OAI Service providers, are already in the pipeline. As it is unlikely for another IR to be launched, and the UM does not yet have a structure in place to support the Article Processing Charges required for Gold OA, OAR@UM will, for the time being, remain the primary OA solution for Malta.

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Bio-note

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Making Disabled People's Voices Vulnerable

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Abstract

This paper attempts to utilise creative writing to contribute to discourse in the fields of critical disability studies and inclusive education. Twelve semi-structured interviews were carried out with young disabled adults with different physical and/or sensorial disabilities who followed or were following courses at further and higher education levels. Research findings that show day-to-day experiences that disabled persons live are presented in short poems to reveal their presumed struggles. The evidence espoused that inclusive education is a process and a way of living. Support from parents, peers, administrators and lecturers are key to individual and community building. Self-help strategies are crucial in developing agency which, with a washback effect would transform society into a more democratic one. However, disabled persons need to be given the opportunity by eradicating the deficit mentality in society towards disability and disabled persons. The discussion unveils how society makes the voices of disabled persons disempowered and vulnerable. It is suggested that in Malta, wider opportunities for disabled persons to pursue their education at further and higher education levels and to enter the employment sector are needed to promulgate inclusive communities. Entities need to emulate a positive and proactive attitude towards social inclusion and cohesion. The contribution of this paper is to create awareness about the dire need for social praxis in fostering emancipation and social justice from a rights-based standpoint in favour of disabled people.

Keywords: *inclusive education, disability, further education, higher education.*

Introduction

As informed by Dewey (1930, p.89), education is fluid and continuous as “education is a constant reorganizing or reconstructing of experience.” The journey of collecting data about the experience of inclusive education of disabled young people with physical and sensorial disability at further and higher education levels positioned me into another trajectory of reflexivity. Poetic creative writing was used as a medium for reflexivity which transformed my ideology of inclusive education and disability. This paper presents research findings that show the mundane challenges that disabled persons live and how society makes their voices vulnerable. The contribution of this

paper is to create awareness about the physical, social and educational factors that are experienced by disabled people. It unveils the struggle that disabled people face while hoping to achieve emancipation and social justice notwithstanding their rights being protected by anti-discrimination instruments (Laws of Malta, 2000; United Nations, 2006).

Theoretical framework

Critical disability theory was used to examine the politics that are entrenched within the experiences of dis/ablement of young adults in their attempt to attend post- and tertiary education and finding employment. Devlin and Pothier (2006) elucidate that “a primary concern of critical disability theory is an interrogation of the language used in the context of disability” (p.3) and that disability “is a question of politics and power (lessness), power over, and power to” (p.2). The application of critical disability theory for interpretation to promote emancipation and social inclusion from a rights-based perspective aligns to Meekosha and Shuttleworth’s (2009) argument that, “emancipation is a cornerstone of critical theory, so it is inevitable that critical disability studies also encapsulate questions of human rights” (p.48).

In analysing how disabled persons are oppressed by society, the social model of disability was utilised as impairment is an attribute of the individual body or mind, whereas disability is a relationship between a person, an impairment and society (Oliver, 1990; Shakespeare, 2006; Barnes & Mercer, 2011). Finkelstein (2004) clarifies that the social model of disability is a tool of activism that provides an insight into the struggle of disabled persons towards emancipation.

Methodology

The findings presented in this paper are taken from one-time semi-structured interviews which were carried out with twelve young disabled adults with different physical and/or sensorial disabilities who followed or were following courses at further and higher education levels. Purposive sampling enabled me to obtain in-depth information to understand the research problem (Cohen et al., 2010). On average, they were an hour long and were audio-recorded. To conceal the identity of the participants, pseudonyms were given to all participants (Smith, Flowers & Larkin, 2010). The transcripts brought forward the issue of bilingualism in Malta. Thus some poems were written in Maltese and others in English depending on how the participants felt comfortable in expressing themselves. Camilleri Grima (2013) argues that the “language question” in Malta, which has been debated since the mid-nineteenth century, still resonates to this day (p.553). Interpretative phenomenological analysis (IPA) was used to analyse the transcripts for the

idiographic essence of the lived experiences of the participants (Smith et al., 2010). Selected excerpts of the interviews were transformed into poetic creative writing by putting together verbatim quotes to create a direct discourse that reflects political dynamics that occur between the self and society through experiences. To enhance the poetic element of the creative writing, few words that adhered to the message of the participants were also added.

Findings

The participants remarked that unless disabled persons' reflections about their experiences are listened to and a process of rumination is activated, emancipation of disabled persons is unlikely to be initiated. The participants put great effort to instil consciousness among non-disabled persons of their rights and reality.

Inclusive education

It can be corroborated that inclusive education is beneficial to all students, as it responds to student diversity (UNESCO, 2016). However, the participants' oral accounts showed that attitudes affect students' experience of inclusive education on a social, environmental and educational level. Democracy, social justice and human rights are the basis for sound inclusive education. Thus, our educational system should detach from a 'one size fits all' mentality (Portelli, 2010). Quality inclusive education also calls further and higher education institutions to be proactive rather than reactive in mainstreaming inclusive education. Our society needs to strive to eradicate the deficit mentality towards disability and disabled persons. This concept supports Ainscow's (1995) argument that, rather than emphasising on integration, there should be a shift towards inclusive education where schools are restructured to meet the needs of all. This is because integration merely entails that the schooling system will remain largely unchanged but would have additional arrangements to accommodate learners. This praxis would shift the culture towards more social inclusion and social cohesion as students would have the opportunity to live experiences together rather than being pulled out of the mainstream.

Disclosure

Riddell and Weedon (2014) explain that students with hidden impairments are the largest group of disabled students. The twelve participants acknowledged that disclosure was hard particularly when a person would be developing an impairment during adolescence or young adulthood, has not accepted the impairment fully, or

it is a hidden impairment. Some of the interviewees questioned the effectiveness of disclosure during employment interviews and on courses application forms as it was not a guarantee that the information was communicated to lecturers. Ongoing support from the staff and friends helped the participants to feel secure and to develop resilience and perseverance, especially during the first year of a course. Support was regarded crucial to come to terms with one's new identity and getting used to a new lifestyle.

Tnezzgħunix mid-dinjità! (A poem from Martin's narrative)

Niftakar...

Kemm kont insibha diffiċli
sabiex naċċetta u bla niftaħar
il-kundizzjoni li għandi b'perikli.
Aħseb u ara ngħid l-employer tiegħi
li bħal seqer fuqi
darba ġie miegħi
u sa anke qalli
il-vista hija don minn Alla,
għandek inkwiet serju.
Din mhix ċajta li wieħed falla
jew rakkont ta' xi misteru.

Għaddew bosta snin
u ddeċidejt nibda kors l-Università
u bħal ħobz bnin
rajt bibien miftuħa biex inwettaq xewqti b'dinjità.
Imma ma bdejtx bil-ward u żahar.
Attendejt għal-laqgħa ta' introduzzjoni
fejn f'ħin minnhom staqsejt imħeġġeġ bin-nar,
"X'faċilitajiet hemm għal nies b'nuqqas ta' dawl jew kumplikazzjoni?"
U dik ixxokkijat ruħha, ngibdet lura u instamtet,
u li kont tal-ewwel lili qaltli.
Le hija ma ffanfret
imma f'qalbi għedt din jonqos f'ħajti.

Do not undress me from my dignity! (Translation: A poem from Martin's narrative)

I remember...
How much I used to find it difficult
to accept without bluffing
my condition that I have with perils.
Let alone I would tell my employer
who as an eagle over me
once he came with me
and he even told me
vision is a virtue from God,
you have serious trouble.
This is not a joke that one missed
or a narrative of a mystery.

Many years passed
and I have decided to start at course at University
and like good bread
I saw open door for me to realise my wish with dignity.
But I did not start with roses and blossoms.
I have attended the introductory meeting
where at one moment filled with fire I have asked,
"What type of facilities are there for persons with visual impairment or a
complication?"
And she was shocked, taken aback and perplexed,
and that I was the first one she told me.
No she did not boast about it
but in my heart I said this is what I need at the moment in my life.

Empowerment and community building

Shogren and Shaw (2016, p.58) argue that "higher levels of empowerment predicted lower levels of financial support and higher levels of employment, emotional wellbeing, and postsecondary education." The findings indicated that inclusive education is dependent upon positive relationships between the self, the family and the community at the educational or employment institution. The development of a social network that promotes community building is likely to propagate social inclusion and social cohesion. Nurturing and empowering young disabled people to develop agency contributes to the wellbeing of individuals and the community. These factors contribute to the development of maturity, resilience, and adaptability to cope with disabling barriers.

Issa l-waqt! (A poem from Clark's narrative)

Għandna defiċit.

Le mhix skuża biex tħossok skonfitt.

Irridu nħarsu 'l quddiem

jekk nemmnu f'dak li ngħidu bis-sliem

li kulħadd għandu dritt għall-edukazzjoni,

u qegħdin f'soċjetà inklussiva u ta' emancipazzjoni.

Irrid ngħid li rrid inkompli nistudja,

ma nafx fejn se nasal avolja mimli fiduċja.

Qegħdin jgħiduli ieqaf,

avolja kontra l-prinċipju wieqaf.

Il-kelma diżabilità aħna s-soċjetà kkrejajna,

għax kull persuna għandu diżabilità aħna smajna.

Il-limitazzjoni ma qiegħda fuq l-individwu qatt.

Is-soċjetà, l-umanità tišhaq dak fil-fatt.

Meta ma nkunux kapaċi nilbsu n-nuċċali biex niffukaw

il-vista tagħna u naraw u naċċettaw

lil kulħadd kif inhu,

hu min hu

bil-limitazzjonijiet

u d-diffikultajiet,

mingħajr kritika,

u tabella satirika.

Din hija xewka, pjaga, stallett

li jinfed sa ġewwa nett.

Now it's the time! (Translation: A poem from Clark's narrative)

We have a deficit.

No it's not an excuse to feel defeated.

We have to look forward

if we believe in what we say peacefully

that everyone has the right of education,

and we are in an inclusive society and of emancipation.

I want to say that I want to continue studying,

I don't know where I'll arrive even though I'm full of trust.

They are telling me to stop,

even though it's against the standing principle.
The word disability we the society have created it,
as every person has a disability we heard.

The limitation is never on the individual.
Society, humanity stressed on that fact.
When we're not able to wear the glasses to focus
our vision and we see and accept
everyone how he is,
whoever he is
with the limitations
and difficulties,
without criticism,
and a satirical label.
This is a fish bone, a wound, a dagger
that pierces profoundly.

Parental support

The participants suggested that at further education, it is essential that like any other adolescent, disabled people develop self-advocacy and learn how to fend for themselves. This implies that with support, parents become sensitive to their children's age and adopt an advisory role. Sanders (2006) argues that when parents overprotect their children, they cause their child to become powerless, be limited in developing advocacy skills and during their transition to adulthood, they become dependent on others. The analysis of the interviews revealed that parental and other adult overprotection has a negative impact on the development of identity, independence and disempowers adolescents.

Peer support

Evidence revealed that friendship with staff and peers of good-will created a support network that promoted the development of individual and group resilience to stressors. Friendship inculcates the development of values that foster social inclusion and cohesion such as reciprocity, interdependence, altruism and solidarity without making a person feel as being a second-class citizen. Høybråten Sigstad (2016) explains that friendship is an important relationship that may include practical support and may act as a protective factor for physical and mental wellbeing.

Administrators' and lecturers' support

Administrators ended up having a salient role in promoting inclusive education. Riehl (2008, p.184) explains that “Principals occupy positions that carry unique responsibilities and opportunities.” Participants claimed that the Principals’ attitude in empowering disabled adolescents to speak up and to seek strategies on how to implement inclusive education was salient in reducing disabling barriers. In developing self-advocacy among adolescents, the participants asserted that people in authority need to be sensible enough to empower and give the opportunity for disabled students to voice themselves.

Lecturers were believed to be main stakeholders in the implementation of inclusive education both in the teaching and assessment components (Shek & Wu, 2014). Lack of standardisation regarding information accessibility disables students. Lack of infrastructure limits the possibility where distance learning could be implemented. The participants remarked that in supporting the lecturers’ input, dissemination of any relevant information must be done as early as possible. As indicated in the excerpts of the interviewees, synergy across stakeholders affects the quality of inclusive education students would experience.

Consultation with disabled persons

Consultation embeds democratic practices within the nuclei of classrooms and institutions that are basic in an inclusive agenda (Shevlin, 2010). The participants argued that unless disabled persons and other minority groups are considered as knowledgeable in their own field and are represented and involved during the consultation process and decision-making, an improvement in inclusive education and employment looks bleak. Consultation reduces pressures arising from power tensions between students, lecturers and administrators, but enhances empowerment between stakeholders.

L-effett tal-mentalità (A poem from Rose’s narrative)

Il-barrieri soċjali huma bla qies
sforz l-injoranza tan-nies.
Jekk ma jkollokx ġenituri li jkunu sodi
u ma joqogħdux jithassruk bl-ebda modi
għax miskina għax ha twegġa’,
jaqtgħulek qalbek, tispiċċa bla heġġa
għax id-dinja fit-tarf iġibulek.
Ikun hemm il-biza’ għal ruġek,

imma b'xewqa ta' farag,
il-ġenituri jgħinuk titla' t-taraġ
biex issiefer, titgħallem il-karozza b'kunfidenza
u b'għozza takkwista l-indipendenza.

L-iktar li ddejjaqni l-mentalità antikwata,
mhux għax forsi joqgħod iħares qisni blata
għax illum il-ġurnata ma nagħtix kas,
imma meta kont iżgħar, meqjusa bħala każ
naf minn xiex għaddejt
sakemm qoxra rabbejt.
Issib Kapijiet li jagħmlulek il-bsaten fir-roti.
Għalliema, dejjem sibt l-għajnuna għan-noti.
Il-ħbieb importanti għax tkun adoloxxenti.
Kieku l-klassi lili le m'accepattatni għax kompromettenti,
emozzjonalment kienet lili tkissirni,
għax tħossok wisq maqtugħa mis-soċjetà li tifnini.

The effect of mentality (Translation: A poem from Rose's narrative)

Social barriers are endless
due to people's ignorance.
If you won't have parents who are firm
and they won't pity you in any way
as poor thing, as she's going to hurt,
and enable you to give up, ending without any zeal
as they would bring up endless difficulties.
There would be fear for your soul,
but with a wish of consolation,
parents would help you to go up the stairs
and go abroad, learn how to drive confidently
and with great affection you'll acquire independence.

The most that bothers me is the old fashioned mentality,
not maybe because he keeps on staring as if I'm a stone
as today I don't pay attention,
but when I was younger, considered as a case
I know what I have been through
until I grew a thick skin.
You'll find Heads who would create many difficulties.
Teachers, I always found help for notes,

Friends are important as you'll be an adolescent.
If the class did not accept me because I'm challenging,
I would have been broken emotionally,
as you'll feel cut too much from society that wears me out.

Self-help strategies

All participants emphasised that disabled people need to learn how to empower themselves and participate in activities with peers and in society. Developing skills of persuasion and reassurance were essential into overcoming personal moments of apprehension. Being brought up in an inclusive culture influenced their self-determination. Self-determination entailed developing psychological strength towards social and educational disabling barriers that are permeated in language, environmental inaccessibility, lack of distance learning opportunities and elements of paternalism expressed by others.

Disabled people's activism

The participants indicated that active participation of disabled persons creates a social capital of disability activists. By means of dialogue and collaboration they enabled staff within educational and employment institutions to become familiar with a typology of a student/ employee that exposed some form of otherness from the traditional student/employee. Their activism created consciousness and had an emancipatory effect on improving accessibility in the building, accessibility in learning and the working environments. The adaptations had a beneficial effect for all students and staff (Chanock, Stevens & Freeman, 2011). They also became conscious of the power they shared stemming from their experiential knowledge. The participants recognised that there is a nexus between further/higher education institutions and employment entities, but the transition from one sector to another is not as smooth as one would expect.

Provision of assistance

Deaf participants and those with hearing impairment indicated that lack of support from lecturers, peers and people while conducting research was detrimental on a social and educational level. These participants recognised that to prevent receiving a different treatment and avoiding humiliation and embarrassment in exposing their vulnerability (Roberts, Georgeson & Kelly, 2009), they used the strategy of "passing" by pretending that they were coping with academic needs (Michalko, 2002, p.21).

Rejection from employers led to poverty, solitude and disillusion. Lack of assistive technology in labs, and lack of audio and tactile resources in public places reduces the confidence of persons with visual impairment to move freely and securely. Such educational and environmental disabling barriers put additional pressure for students to finish assignments and research on time.

All is fine! (A poem from Ann's narrative)

The transition to university
instilled hope and curiosity.
It made me aware that I needed help
with a voiceless yelp.
Since I was a teenager I had repents
to ask for help from friends
as it was very embarrassing
to do the act of incessant pretending.
I am deaf and depend on lip reading,
so I can't listen and write as if I'm weaving.
I had to copy or borrow notes from friends
as electronic note takers are recent trends.
My parents encouraged me to continue with my studies,
and my teachers let me sit in the front of their settees.
They ensured that I was following
what they were saying or bellowing.

Finding employment
was one of the most difficult torment
and heart-breaking experience
for which I had to develop resilience.
Being deaf, employers were not interested
in giving me a chance, even if so far I persisted.
Although I had the qualifications as requested,
since I was without experience I was still rejected.

Discussion

This paper contributes methodologically by demonstrating how, within the Maltese context, findings at grassroots level could be transformed into creative writing. In creating community building, a socio-cultural praxis pro-inclusion can create a collective commitment to promote social justice and celebrate diversity in a

way that empowers individuals irrelevant of their differences (Adams & Brown, 2006; Gordon, 2009; Burgstahler, 2010). This statement adheres to Dewey's (1930) assertion that the process of living together reaps educational benefits. As suggested by Portelli (2010), there is the need for more open fora that critically deconstruct and reconstruct the 'learning landscape' by different stakeholders. This open discussion on inclusive education could be regarded as a process of growth to reach out to different learners (Ainscow, 2008). An inclusive culture necessitates creative and flexible systems of inclusion to suite different learners rather than having a fixed interpretation of inclusive education. This approach would recognise that each student is unique, has strengths and difficulties and a right for quality education (Corbett, 2001). Wider opportunities for disabled persons to enter further and higher education academic and vocational institutions are recommended, as these are a niche to create inclusive communities that respect the dignity of disabled persons.

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Bio-note

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Towards Better Protection of Modern Twentieth Century Architecture in Malta

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Abstract

This paper attempts to highlight the need to promote more awareness of the value of twentieth century buildings in Malta and to intensify their protection. What to keep and maintain is debatable and depends on which philosophies of restoration are adopted. Heritage protection institutions, such as ICONOMOS, UNESCO and the Council of Europe intend to afford the same protection to modern architecture previously reserved for much older buildings. In Malta the legal framework has long been set up to protect the architectural heritage that has been classified and scheduled according to the guidelines of these institutions but the emphasis is on pre-1920's buildings. Unless the list is updated regularly to include examples of architecture of later periods there is the risk of losing these in the frenzy of the rapid development occurring at present. Educating citizens to value these buildings and even any architectural features and interior décor inspired by this period, should hopefully lead to a higher level of protection. As an example, the lens will be focused on the Gian Frangisk Abela Junior College.

Keywords: *modern architecture, conservation theory, Malta.*

Introduction

Architecture is considered as an art in its own right with the visual arts such as painting and sculpture developing in its context. Its primary aim has always been to fulfill man's basic needs of shelter and security but it is now accepted that buildings also have spiritual and intellectual roles expressed not only by the structure itself but also by its interiors together with the relationship between the two and their surroundings. Even though not all buildings are prestigious or impressive, they are a reflection of the spirit of their time, the people involved in their design and the social context when they were built (Gympel, 1996). For these reasons architecture of different periods in history without exception need to be conserved as destroying any period or style completely would sever the chain that has made us what we are today.

The destruction of historic monuments and vandalism that occurred during the French Revolution led to the development of conservation theories when the cultural heritage began to be appreciated. Historic monuments began to be classified, included in an inventory and subsequently restored and conserved. The idea that every citizen had a moral responsibility in this equation began to take ground and also the idea that conservation had to happen not only for the present generation but also for future ones. Heritage began to belong to the common people too who began to be represented by commissions set up for this purpose. Italy and Greece followed France and since then it has become every country's duty to conserve their Nation's cultural heritage (Jokilehto, 1986).

The question that has always been so difficult to answer is how to classify and define a historic monument or building, which buildings to value and why. In Malta, most twentieth century architecture is regarded as not old enough to merit protection. There are areas like the town centers that are protected and specific buildings that are graded, with some buildings being added to the list periodically but not many that were constructed in the twentieth century. For the purpose of this paper, modern architecture will deal with buildings of the twentieth century as inspired by the movements in the first half of the century and are in danger of being eradicated completely. By destroying them and getting obsessed with the new contemporary architecture that will give us greater monetary value there is a danger of losing a part of our cultural heritage, because these buildings tell us a story about the society that built them.

Modern Architecture

The political scenarios and events that occurred in various parts of the world from the second half of the nineteenth century onwards influenced the emergence of the various modern movements both in the art scene and in architecture. The other factor that influenced such enormous change was the acceleration of industrialisation and the fast social change it brought about that led to the need for many more buildings in urban areas to accommodate workers that ended up being just inhuman and unnatural spaces. The need to rebuild both literally and metaphorically occurred after the two world wars but this time technology was embraced. Architecture stopped being perceived as the organisation of space just for shelter but more attention started being given to the exterior with how light infiltrated the building and the reaction of the individuals who occupied the space. Some important new constructional techniques based on technology included: a) the use of steel structures and concrete frameworks to replace walls as the architectural elements that support and separate; b) the use of much lighter and less bulky materials such as hollow bricks, synthetic materials or light weight pumice concrete to build the remaining walls; c) the reduction in size of the supporting elements as a result of a better and

more accurate knowledge of tensile and compressive strengths of the materials used; d) the construction of much larger openings to the outside resulting in much more light streaming in; e) the use of glass as an integral part of the structure and f) flat roofs that opened up more design possibilities in the interior (Gropius, 1965).

It was Walter Gropius in 1919 with a famous proclamation that started the Bauhaus movement that exposed the most influential ideas. Design and craftsmanship were to be merged together and different disciplines were to be united to construct a final superior form that in his words would, “rise one day towards heaven from the hands of a million workers like the crystal symbol of a new faith”. It also dealt with architects being encouraged to have fantasies and not to limit themselves with technical difficulties. Most of these could be overcome with the great advances in technology and the use of different materials like concrete, glass and steel, in construction (Frampton, 2007). The architects of the Modernist movement wished to speak of the future through their works reflecting the advances in democracy, science and technology that were occurring. There was a romantic and theatrical vision with a strong aesthetic interest even though they prided themselves that the focus was strictly technological (De Botton, 2006). Their main target was mass production but aimed to construct type-forms that not only met the technical and commercial demands but the aesthetic ones too (Gropius, 1965). It was a very special time in the history of architecture and this is why it is of superlative importance to conserve any example of architecture in Malta that is an expression of this philosophy and the new application of technology and building techniques since these establish the link between the way buildings were constructed before the exposition of these ideas and the way they are now. For these reasons good quality buildings inspired by this movement need to be restored and conserved.

Values in Conservation Theory

When one attempts to apply the theories of conservation to modern architecture, the same challenging problems are encountered. Whenever rules are established their interpretation and hence their enforcement will always be problematic. The diverse theories which are still applicable today prioritise different values. Choay, the French architectural and urban historian and theorist, in her famous work, ‘The Invention of the Historic Monument’, attempted to list and analyze the values that were given importance at the time the theories of conservation were being developed. And even though what is written was meant to apply predominantly for older buildings, seeing that construction carried out during the twentieth century needs to be protected too, one may also apply the same arguments on this occasion. She tackles the national, cognitive, economic and the artistic values and also refers to, what she calls, the piety value in relation to the ‘consecration phase’ occurring between 1820 and 1960.

The national value is considered as the most important and is the starting point of all that followed, but also of great importance is the cognitive value that regards historic buildings and monuments as carriers of knowledge and as witnesses of what was occurring at the time, be it political, or related to custom, or the art and techniques used for construction. Buildings are a living memory of the sentiments of people and a symbol of their civic duty. The economic value cannot be underestimated either, as many historic buildings were ultimately conserved because they fitted into a financial model and could be used for cultural tourism or else with a change of use utilised for other functions. Although this idea might not be applicable to twentieth century buildings, demolition to rebuilt blocks of apartments should not be the only financial model considered, a more idealistic vision of future uses need to be taken into consideration in the evaluating process. The fourth value, the artistic value was the hardest to define and was considered as an imprecise and vague concept as many question the artistic quality of modern architecture. Beauty is in the eye of the beholder and for many, modern architecture is not considered as worth protecting, as they do not find it aesthetically pleasing and even strange. But does this justify pulling these buildings down? (Choay, 2001). Closely linked to the piety value, the English art and architecture critic John Ruskin in his most popular book 'The Seven Lamps of Architecture' discusses the memory value as one of the seven principles of architecture that he linked with seven moral attributes inseparable from design. When speaking about this memory value of architecture he said, "We may live without, and worship without her, but we cannot remember without her" (Ruskin, 1849:162-182).

Keeping all the above values in mind, what was meant for historic monuments and buildings of the time may be seen to be also applicable to twentieth century architecture that will soon become the historic buildings of the future. These buildings should be considered of national importance too, awareness about them needs to be stepped up through education and their aesthetic qualities highlighted so that more people appreciate them. They are also very important for our memories and to keep a complete picture of the history of architecture. Demolishing them in the name of development would be unpardonable.

Charters and Conventions

During the twentieth century, the theories, philosophies and the values that were unmasked led to a trend towards the strengthening of cultural ideology resulting in several charters and conventions that focused on the conservation of historic monuments and buildings. These were not meant to protect buildings that were being built during that time but older ones. Now, half a century later the same documents need to be applied to what was then considered as modern architecture and not meriting protection as these too have now become an essential part of

our history and culture. Although not legally binding, the charters are still very important to consult before any administrative actions are taken, policies decided upon and legislation enacted.

The Athens Charter adopted at the First International Congress of Architects and Technicians of Historic Monuments of 1931, besides dealing with the proper care and restoration of monuments, focuses also on the identification of these by architects. At the same Congress seven main resolutions were agreed upon, the 'Carta del Restauro', that experts and practitioners were expected to follow and also calling for Governments to adopt (Mifsud Bonnici, 2008). Thirty-three years later at the Second Congress, in Article 1, The Venice Charter specifically referred that, "this applies not only to great works of art but also to more modest works of the past which have acquired cultural significance with the passing of time". Implying that as time goes on, other modest buildings and monuments acquire cultural significance, it should become imperative that these will be included in the list to be protected. This Charter in Article 5 acknowledges that for permanent conservation there might be the need for the change of use of a building for a social purpose but prohibits the change of layout or decoration of the building. This too needs to be taken into consideration (The Venice Charter, Articles1, 5.).

Then, during the 'European Architectural Heritage Year' of 1975, the 'European Charter of the Architectural Heritage' was signed by the Committee of Ministers of the Council of Europe and among the considerations that were emphasised were that Europe's Architectural heritage not only has a priceless cultural value but that it gives people the consciousness of their history and their future. It encourages independent organisations to arouse the public interest and educational programs about the cultural heritage to be disseminated with the younger generation especially in mind. It emphasises that for buildings to be worth conserving, they need to be of high quality. It ends by referring to 'the new buildings of today' that will become 'the heritage of tomorrow'. Thus, quality buildings of the twentieth century have already become part of our heritage and need to be protected too (The European Charter of the Architectural Heritage, 1975).

Various conventions including the 'Convention for the Protection for the Architectural Heritage of Europe' by the Council of Europe, the UNESCO 'Convention for safeguarding of Intangible Cultural Heritage', the UNESCO 'Convention on the Protection and Promotion of the Diversity of Cultural Expression' and the Council of Europe 'Framework Convention on the value of Cultural Heritage for Society' to which Malta is signatory came in quick succession. They continued to build on the main ideas with emphasis on future legislation, enforcement and the social and educational aspects. The 'International Council on Monuments and Sites' (ICOMOS), the non-governmental International organisation that is the official advisor of UNESCO and the World Heritage Committee in article 2 of the 'Ethical Commitment Statement' outlines one of the main obligations of an ICOMOS member, to advocate conservation retaining the cultural identity as evidence of the past (Mifsud Bonnici, 2008).

Since then, countries, including Malta have legislated to protect their cultural heritage in similar ways based on these conventions, charters and treaties that were agreed upon. Specific cultural protection at international level has been slower to develop. Deciding which buildings to preserve is still problematic especially with buildings of the past century. Deciding what is to be considered historic and what is not, or whether a building has aesthetic value is not easy. But considering the other values too, such as the cognitive and the memory values, should facilitate the decisions to be made in the interest of future generations.

Modern Architecture in Malta

Famous examples of modern architecture in Europe built by famous modern architects are nowadays well protected. The works of Swiss-born architect and city planner Le Corbusier, for example, went beyond utility and 'style' to embrace the expression of an emotional relationship between man and his surrounding. He used raw materials, higher mathematics and intellectual speculation to distance himself from the customs that in his opinion stifled architecture and expounded his technical and aesthetic views. His ideas were expressed in a compilation of articles entitled 'Towards a New Architecture' (Le Corbusier, 1986). So influential was his work that seventeen of his works found in seven countries are today classified by UNESCO as 'World Heritage Sites'.

In Malta there are no examples of buildings of such fame but there were architects inspired by Gropius, Le Corbusier and other influential architects, who build good quality structures in this style and followed the same ideology about light and the relationship of the inside of a building with the outside. Light is especially important when evaluating architecture. Different impressions may be created by the orientation and size of its openings giving more importance to the quality of natural light than the quantity (Rasmussen, 1964). Since the majority of architecture built in the twentieth century in Malta did not fully embrace the International Modern Style but have elements of the Baroque period and the local vernacular, it is even more important to protect the works of those architects that embraced it.

Architect and civil engineer Joseph Huntingford, for example, was instrumental in contributing to many high quality buildings when he was put in charge of the design and construction works of many of the schools and public buildings in Gozo between 1950 and 1961. One of the best examples of his work was the Qala primary built in the International modernist style. In 2006 this was converted to house the 'Institute of Tourism Studies'. In the process, parts were demolished and though change in use is acceptable, destruction of any part is unacceptable (Schiavone, 2009). Other architects who embraced the International Modernist Style were Joseph M. Spiteri (ex. Modernist Villa built for Laurence Xuereb in Ta' Xbiex), Joe Consiglio (ex. Technical School in Kordin) (Thake, 2014) and Jo Tonna (ex. Daniel Micallef's Temple

House in Tal-Virtu) (Tonna, 2004). There are still a number of humble buildings in Malta and Gozo that merit protection before they are demolished. Some are still not scheduled and others have been but are in a bad state. A case in point is the run-down corner house at the crossroad between Naxxar Road and Francis Xerri Street in B'Kara (definitely a familiar landmark in most Maltese nationals' memory).



Fig. 1: Photograph of a twentieth century house at the crossroad between Naxxar Road and Francis Xerri Street in B'Kara. (Photo credit: Sandra Mifsud Bonnici)

Praxis and Gian Frangisk Abela Junior College

An appreciation of this period in the history of architecture where buildings began to be seen as having the potential to transform and inspire people has become of utmost importance. One needs to look out for these buildings and what they stand for and for the influence they have on present and future contemporary architecture. To give a practical example, the spotlight will be turned on the Modernist building 'Gian Frangisk Abela Junior College' in Msida, previously the 'Malta College of Arts, Science and Technology', built between 1962 to 1966, and now catering for thousands of post-secondary students. Victor Anastasi who was a draughtsman with the Public Works designed it (Muscat, 2016). At first glance the building is a plain one but with a very wide, almost grand staircase leading to it. Two extensions on either side of the main front building have been recently added, co-funded by the European Union.



**Fig.2 Photograph of Gian Frangisk Abela Junior College in Msida.
(Photo credit: Sandra Mifsud Bonnici)**

One enters into the atrium and finds a bold masterpiece, a modern installation made of several paintings on canvas by Harry Alden hanging opposite the entrance 'framed' by the architectural features of pillars and beams, recently painted with contrasting colours. The two original four story wings have typical rows of windows. At the back of one of these wings lies a one-story extension that houses the Junior College Chapel: a small jewel in the Modernist style. The north-facing wall, almost completely open to the outside, still has the original wrought iron doors and windows with other wrought iron decorative frames fixed to the outside for added security. The architectural details outside the north-facing wall are decorative with squares 'cut out' in a vertical piece of concrete supporting a horizontal slab that creates shade. The sun infiltrates the space throughout the day from the smaller windows on the south-facing wall. The interiors are almost untouched since it was built. The floor is covered with black tiles with large grits of peach, grey and black marble, a typical floor used in up-market buildings in Malta during this period and the ceiling is covered with a wooden-grid soffit incorporating the light fixtures, a very rare decorative feature on the island. Originally designed as a students' common room, its use was changed to a catholic chapel and is still being used in this way to date.



Fig. 3 Photograph of the Junior College Chapel. (Photo credit: Sandra Mifsud Bonnici)



Fig. 4 Interior of the Junior College Chapel. (Photo credit: Sandra Mifsud Bonnici)

We come now to consider the values discussed above to this chapel. It is not only a good example of 1960's architecture and interiors but one must consider the memory value of the all the activities, masses and celebrations that happened there. A particularly special example of its use was the baptism of a newborn during the Easter celebration in March 2007. Throughout the past years mass was said twice a day during the week, adoration of the sacrament takes place daily. Prayer groups are organised and the Christmas and Easter functions have also been celebrated there. In November 2018, a quick count of individuals attending 7.00am and 12.30pm masses was carried out. Figure 5 shows the attendance of the number of persons attending each mass. When considering that this chapel is servicing around 3000 individuals between students and staff, the attendance is comparable if not better than that of other churches in Malta and Gozo. Thus, plans to demolish this building (currently provisionally shelved due to lack of funds) to house a larger library that admittedly is needed, should be revisited when other than the economic value of the land it stands on, one should also consider its national value, its artistic value, its cognitive value and as a place of worship, the piety and memory values. Change of use is discouraged when dealing with a building type connected with religion such as chapels, churches mosques and other places of worship and if carried, the strict rule is that the space must be kept unified (Guggenheim, 2013). All religious buildings have an important role in the history of architecture by filling spiritual needs of people, giving them hope of a higher justice and offering them comfort (Gympel, 1996).

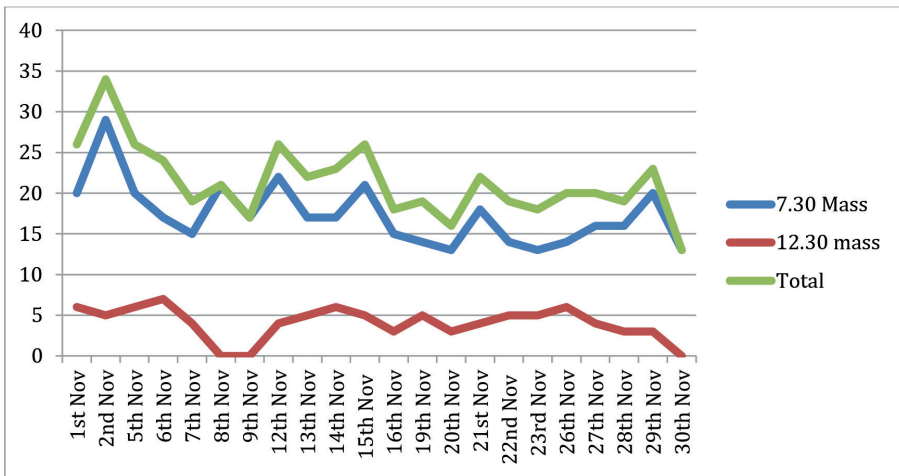


Fig. 5 Graph showing attendance at mass during the month of November 2018 at the Junior College Chapel. (Statistics compiled by the author)
Y axis should be labelled 'Number persons per mass'.

Conclusion

There are many small gems, similar to the Junior College Chapel mostly found on the outskirts of the towns and villages around Malta. The list of twentieth century buildings to be protected needs to be regularly updated so that this type of architecture representative of the modernist style is protected. The new techniques used to build them forms the link between previous construction techniques and those now used in contemporary buildings. One cannot go to contemporary high rise buildings and five to eight story blocks of flats, without conserving some examples of modernist style buildings as these too are cultural artifacts and will become more valuable as time goes by. It is not just rows of terraced town houses, 'auberges', 'palazzos' and fortifications that need to be protected. The evolution of architectural conservation began from that of individual buildings for educational, inspirational or even romantic and nostalgic reasons to a broad discipline that encompasses historic centers backed by governmental and non-governmental organisations and subject to various documents as mentioned above. Across the centuries, conservation has spread to include historic gardens, industrial archaeology, domestic architecture and now even the Modern Movement (Rodwell, 2007) and in Malta we need desperately to embrace this.

Education and a greater appreciation of what is classified as modern architecture and its value needs to be stepped up. Giving value only to monetary models is wrong, instead one needs to find alternative uses for such buildings so that they are kept and may be enjoyed. Everyone has responsibilities, the nation has the obligation to save and conserve these buildings for future generations at the cost of offering schemes to compensate owners who have these types of buildings for their loss in monetary value, the architects of our time need to take into consideration the moral conscience when planning contemporary buildings knowing that in the future they too will acquire importance if quality buildings are constructed, and finally Maltese society needs to become more aware and to fight to conserve twentieth century buildings as they contain the stories of the individuals who lived in them and give important snapshots of our story as a nation.

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Charters and Conventions

- The Athens Charter for the restoration of Historic Monuments (1931).
- The Venice Charter 1964: International Charter for the Conservation and Restoration of Monuments and Sites.
- The European Charter of the Architectural Heritage 1975, Council of Europe.
- Convention for safeguarding of Intangible Cultural Heritage, UNESCO.
- Convention on the Protection and Promotion of the Diversity of Cultural Expression, UNESCO.
- Ethical Commitment Statement, ICOMOS.

Bio-note

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Avoiding the Pheidippides Effect: How Theories Contribute to Endurance Trail Practice

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Abstract

Ultra endurance sport has shown a significant increase during the last couple of decades. This paper focuses on theories which explain the phenomenal efforts ultra endurance athletes face when running extreme distances. These ultra athletes have to endure physical pain and mental distress for long hours or even days before crossing the finishing line. This extreme running on technical terrain requires considerable physiological effort (Millet, Hoffman, & Morin, 2012). Freund et al. (2012), states that as a consequence of running such distances, runners will experience muscle soreness, cramps, ruptured muscle fibres that lead to myalgia and myofascial pain, compartment syndrome, inflammation of tendons and joint capsules, and fatigue fractures. And yet, none of them succumb to their injuries or exhaustion under normal conditions, as in the case of Pheidippides.

Various theories argue that the body is a high functioning machine which depends on physical measures to determine its efficiency while others put the brain as central to endurance practice and argue that the brain is the ultimate regulator which is there to protect the body. The athlete can never be harmed as the brain is taking measures so that body systems are never in distress. The beating heart is protected and catastrophe cannot occur.

This paper illustrates various diverse theories which posit different arguments regarding extreme running and how it is actually achievable, without the athlete perishing due to the effort.

Keywords: *endurance, ultra distance running, physiological theories, brain centered theories*

Introduction

The history of ultra distance running can be traced back to two million years ago when the Homo species started evolving and exploring. A mummified male corpse of an ice man in the Swiss Alps offers evidence of the first recorded ultra distance journey (Rollo et al., 2006).

The International Association of Ultra runners (IAU) considers ultra running events as:

Road races, trail races or track running events either indoors or outdoors, beyond the distance of the Marathon; the standard distance recognized by the International Association Athletics Federation (IAAF) is the 100km on road; the other standard distances and events recognised by IAU (on road and track) are 50km, 6 hours, 100 miles, 24 hours, 48 hours, 6 days and 1000 miles, as well as the 100km on the track (www.iau-ultramarathon.org).

The first recorded ultra distances which surpass any other previous events were the Arctic expeditions of the early 20th century. Noakes (2006), describes the Herculean efforts of Robert Scott in 1911/12 and Ernest Shackleton in 1914/16 when they traversed extreme distances across the arctic and argues that such endeavors depend on the willingness and volition of the mind.

Ultra distance running has seen the most positive increase in popularity during the last decades. It has increased both in terms of registered races and also in terms of participants. During the year 2000, 43705 ultra runners participated in such races whereas in 2018 the number increased to 354616. (<http://statistik.d-u-v.org/index.php>).

Pathophysiology

Statistics show that athletes are finding appeal in extreme running events that require specific skills, endurance and fitness which are most likely to lead to injury either during the grueling training or during the race itself. Knechtle & Nikolidis (2018) confirm that ultra marathon running is stressful to various body systems including the immune, the cardiovascular, the skeletal, the digestive system and various organs including the liver and kidneys and that completing an ultra marathon has no “immediate health benefits” (p. 24).

The data is clear, ultra trail racing is becoming a very popular endurance sport albeit proving to be very difficult, demanding and high risk. But can all this pathophysiology lead to catastrophe as in the case of Pheidippides? Various theories argue in favour of long distance practice and explain how such feats of endurance are achievable.

Theories behind endurance race practice

Millet & Millet (2012), claim that ultra marathon running is “probably one of the most demanding physical exercise in humans, maybe only overpassed by polar expeditions” (p.1).

In their systematic review, Knechtle & Nikolaidis (2018), quote Rüst et al., (2012) arguing that ultra marathon runners do more weekly mileage, albeit slower than

marathon runners, have a higher pain tolerance (Freund et al., 2013) than other populations and this gives them the ability to run longer distances.

While studying North American Ultras, Hoffman et al. (2010), considered race results over a 30 year period (1977-2008) and found that the number of races and finishers has increased at an accelerated rate. Trail races which accounted for 51 out of the 53 hundred milers in North America, seemed more appealing than road ultras.

When running on mountain trails, ultra trail athletes run extreme distances and times while traversing mountain passes at high altitude in difficult conditions. The topography is mostly mountain and forest paths with exposed roots and rocks, streams and rivers, scree and huge elevations, kilometers long with extreme gradients. The sheer distance on uneven, non-elastic terrain, and long descents have a negative effect on the leg muscles (Giandolini et al., 2016; Eston et al., 1995), which become painful and damaged, the effects of which can last for two days post run (Giandolini et al., 2016; Easthope et al., 2010).

Athletes also run at altitude, and although the effects of anoxia are not debilitating at altitudes of 2000m-2500m, which are the typical elevations of mountain ultras, there is a noticeable effect on running performance (Marcora, 2009; Millet et al., 2012) so much so, that athletes experience nausea, headaches, dizziness and reduced VO_2 max (the optimal rate at which oxygen can be utilized), which overall reduce endurance and perhaps the will to continue.

Sleep deprivation (Drummond et al., 2006) is also a major issue ultra runners have to overcome when running an ultra of at least a 100km. Running for more than 24 consecutive hours means that the athletes have to run through 2 nights (long ultras start at midnight) and fight the urge to sleep while trying to keep on the trail using the light from their headtorch.

According to Marcora & Staiano (2010), any adverse stimulus increases the sense of effort and therefore reduces the endurance capacity because the activity feels more difficult. When Keramidas et al. (2018), studied the physiological and psychological data of well-trained subjects during a 2day training camp with partial sleep deprivation, they established that sleeplessness was correlated to, “cardiorespiratory and psychological strain, and reduced the high-intensity constant-load cycling capacity” (p.1378). Hurdiel et al. (2015), established that Ultra Trail du Mont Blanc (UTMB) participants who have to run through two nights during the 46.5 hours cut off time, suffered from reduced cognitive activity, loss of balance and one even suffered from transient amnesia for the duration of an hour.

Other painful physical stressors include gastrointestinal distress, (Stuempfle et al., 2013; Gil et al., 1998), exposure to heat and humidity, (Maughan & Shirreffs, 2010), vision loss (Høeg, 2015), dehydration (Hoffman et al., 2018) and also mental fatigue (Van Cutsem et al., 2017).

Millet et al. (2012), also acknowledge muscular damage and gastrointestinal distress as race stressors which need to be addressed during an ultra.

The body is a machine: Endurance depends on physiology

According to Joyner & Coyle (2008), endurance practice is determined by the VO_2 Max, lactate threshold and efficiency (ratio of output power to input power). These physiological measures have been investigated thoroughly and elite athletes tend to have high values of such parameters. In theory, these quantities ensure that an athlete has the physical attributes to be successful, but when actually racing with competitors who have similar measures, will physiology dictate the winner? Andrew M. Jones certainly thought so when he collaborated with Paula Radcliff when she trained and achieved the world record for the marathon. These factors were certainly the winning formula Radcliff used to set a new record in the female marathon distance. Jones (2006), reviews the evidence based physiological methods used to enhance endurance running output. This method based solely on values and numerical certainties presented world breaking results and “15 years of directed training created the ‘complete’ female distance runner...” (abstract, p.101). Jones’ work on the physiology of running fuel the ‘human machine’ arena without acknowledging other factors like motivation.

The theory that human endurance is thoroughly dependent on the cell and muscle physiology was initially investigated by A.V. Hill (Hill & Lupton, 1923).

Hill’s theory was based on the assumption that the body is a machine limited only by physical boundaries. He devised the first means of measuring the maximum uptake of oxygen by the muscles, called the VO_2 Max, which is still a very useful tool for measuring the efficiency of the human body nowadays. According to Hill’s theory, one could only run as fast and last for so much time as long as the muscles were efficient in their uptake of oxygen and their tolerance to lactate. This oxygen would then be used in pathways to make the body run as fast as it could. When this efficiency decreased with inefficient oxygen uptake, the machine would stop functioning. At this point the heart would not be able to cope with the demands of the contracting muscles and would become ischemic and ultimately fail. This theory is therefore deemed as catastrophic as homeostasis is not maintained (Noakes, 2012).

Fatigue, according to Hill’s theory would set in when the muscle fibers were all recruited, indicating that there is only one pace when running. Although Hill acknowledged that the beating heart was controlled possibly by the brain, which he called the governor, this part of his theory was neglected.

Hill’s theory however, could not explain why athletes did not keep a constant pace during racing or why fatigue set in long before the athletes stopped running. According to Hill’s theory no muscular fatigue should be present until all the muscle fibers were recruited. In a very interesting study by Saugy et al. (2013), it was shown that during very long ultra runs in the mountains, the muscles used for running were actually preserved. While studying the effects on neuromuscular alterations on well-trained participants running Tor des Geants (a 330km trail race with

24000m of positive elevation gain), the authors found that extremely long distance running, “revealed less neuromuscular fatigue, muscle damage and inflammation than in shorter Mountain Ultra Marathons. In conclusion, paradoxically, such extreme exercise seems to induce a relative muscle preservation process” (abstract). In addition, after 30-36 hours of running the authors also demonstrated that muscular voluntary activation loss does not decrease further. The authors theorized that this was probably due to the fact that competitors slowed down in longer ultras, a fact that A.V. Hill did not actually acknowledge when he proposed his theory.

The brain is Central: Endurance depends on the brain

i) The central governor theory

The importance of changing pace during racing was recognized by Tim Noakes who posited that anticipatory regulation is crucial during extremely long bipedal running events. When studying 32 mile records, Noakes et al. (2009), noted that the fastest lap was the last lap in the majority of cases which was also the case for longer running events. This led the authors to conclude that pacing was extremely important and the final spurt indicates that the body gets fatigued during the run in order to have a reserve at the end. Noakes’ theory postulates that the brain, which he called the ‘Central Governor’, is actually what regulates endurance. The ultimate aim of the brain is to protect the body and maintain homeostasis. The brain regulates the pace according to various factors like mental fatigue, sleeplessness, caloric intake, core temperature and various other factors, and only allows the pace to increase when it deems the situation to be safe, like arriving to the finish of a race. In the authors’ opinion, it is the reason why almost nobody dies of exhaustion while running. In such a scenario, catastrophe (heart failure) cannot occur as the brain is taking measures to protect it.

ii) The psychobiological theory

Samuele Marcora (Marcora & Staiano, 2010) believes that the most important factor on which endurance practice relies, is the perception of effort which lies in the brain. He argues that muscle fatigue is not really the limiting factor for endurance but rather, one stops doing exercise when he/she perceives that the effort to be too much. At that stage, the participant does not have the will to keep engaged in the pursuit.

Brain activity changes when a central motor command is fired and sends signals via motoneurons to the muscles. Every time this happens a copy of this command goes to the sensory area of the brain to create a perception of effort. (Marcora &

Staiano, 2010). Perception of effort is then influenced by various factors including sleep deprivation or mental fatigue which make the perceived effort harder. Marcora conducted various experiments on endurance performance, whereby he made the effort seem more difficult or easy without altering the physical parameters like heart rate or VO_2 max (de Morree & Marcora, 2012; McCormick et al., 2018).

During a test to exhaustion, he asked test subjects to cycle to their maximum perceived effort and stop when they felt they could not go any further. When they stopped, he asked them to resume cycling as hard as they could and offered a monetary reward for the best 3 performances. The subjects were able to generate much more power despite the fact that they felt that they had reached exhaustion just moments before (Marcora & Staiano, 2010). By using monetary rewards and a sense of competition, the authors were able to influence the sense of effort and make the participants work harder.

Subtle signals can also affect the perception of effort and make a run seem more difficult or easy. To prove this, subjects were shown 18ms images of a smiling or frowning faces while cycling. The test subjects were not even aware of these images but the results yielded very salient findings. The cyclists who were shown the smiling faces performed better. Being social animals, humans are influenced by facial expressions and the fact that they were shown smiling faces reduced their perception of effort and made the cycling feel easier (Blanchfield et al., 2014). This might suggest that being positive and smiling during laborious running reduces the perception of effort and thus impact positively on endurance.

The will to endure and overcome powerful responses is built by the endurance athlete over the years by intense training (Astokorki & Mauger, 2017; O'Leary et al., 2017; Roebuck et al., 2018). If athletes are mentally trained not to succumb to powerful urges, endurance is not affected. Pageaux et al. (2014), established the effect of response inhibition on the outcome of exercise by having athletes do a tedious Stroop test to increase mental fatigue prior to running a 5k time trial. The test subjects took longer to finish the time trial when compared to the control group, and also felt that the perceived effort was higher, even though the measured lactate and heart rate not were altered.

The endurance runner, therefore, might find it extremely beneficial to start the race with a clear, fresh mind, with thoughts and worries brushed aside so that initially at least, the perceived effort is low. According to Jurek (2012), one of the most influential ultra runners, "An empty mind is dominant mind" (p.87). In such long races however, factors like sleep deprivation, mental exhaustion, increased core temperature or altitude add up and increase the perception of effort. Coping strategies like positive self-talk (Weinberg et al., 1984; Thelwell & Greenlees, 2003), mouth rinsing (Pottier et al., 2010) and caffeine (Duncan et al., 2013; Noakes et al., 2018) amongst others, which manipulate perception of effort will surely aid the runner towards achieving his/her goal by reducing the sense of effort.

iii) Interoception

Seasoned runners called “adventure racers” by Paulus et al. (2012), are more efficient in responding to stressful physical and psychological situations. This fact was revealed by experiments studying the insular cortex (Paulus et al., 2003), which according to the authors, shows enhanced activity when the athletes are getting ready for a demanding situation but which settles down when they are actually dealing with the situation (Paulus et al., 2012). Paulus studies interoception or how the brain responds to internal body signals in relation to external stimuli in order to maintain homeostasis.

Paulus et al. (2009), describe an extreme environment as “an external context that exposes individuals to demanding psychological and/or physical conditions, and which may have profound effects on cognitive and behavioral performance” (p.1080).

Paulus et al. (2012), believe that elite performers are very much in tune with their bodies and their outstanding training has exposed them to conditions where they prepare their minds in advance to cope with adverse situations. They argue that this population shows an enhanced and specialized brain activity consistent with quick adaptation to extreme environment. When anticipating a traumatic situation, their circular cortex shows heightened activity when visualized through an MRI, meaning that their body is getting ready for the situation ahead. During the adverse stimulus however, the brain activity is lower than that of the control group indicating much less anxiety in the test subjects. Paulus et al. (2012) conclude that: “Optimal performers are able to more quickly adapt to both bottom-up interoceptive afferents and top-down cognitive control brain areas that modulate mood and anxiety in regulating one’s response to an aversive interoceptive perturbation” (p.9).

Conclusions

As the above theories demonstrate, extreme ultra running is a very demanding sport which might lead to injury and mental distress, and yet more athletes are being successful and not succumbing to the punishing conditions. The purpose of this paper was not to find the magic formula for success. The theories presented give more introspection into the sport and perhaps a clearer understanding of the demands behind those long hours, by looking at studies which put ultra athletes to the test.

What is actually true, is that this population is a special one. They have intuitively discovered what needs to be done to take them to that finish line hours or days after they started. The research presented tries to make meaning of these endeavors by looking at physiological and cognitive theories and how these might aid the athlete. In reality however, more caveats come into play like personalities, motivation,

resilience and mental toughness. The most important conclusion though is that this extreme sport is a fertile ground for research both for studying the physical limits and also the mental capabilities of this population.

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The Sharing Economy, Jobs and Skills

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Abstract

The global economy is entering the third wave of information technology, characterized by interconnected platforms of people, objects and resources. The Internet of Things (IoT) as a technology-enabler of the Sharing Economy and its global platforms are due to grow exponentially in the next decade, placing demands on skills and changing the employment landscape. The demand for low-value-adding work will decrease as resources are used more effectively whilst the demand for information technology skills will continue to rise in order to meet the requirements of developing IoT products, software, apps, networks, cloud infrastructure, data management and information systems.

The Internet of Things (IoT) will change the way we live. The Sharing Economy will bring about new types of revenues. Jobs and skills will take a new direction. We need to be ready for the Third Wave in order to retain and develop our competitive edge.

The First Wave of Information Technology came in the 1980s when the first computers appeared in our homes and organisations. Some of us here today are old enough to remember the first ZX81s, Ataris and IBMs, followed by Compaq computers and IBM clones. It was a time when IT moved into the H2M era when humans started to interact with electronic machines on a domestic scale.

The Second Wave was when the Internet made its way into homes and workplaces in the mid-1990s. We experienced the browser wars of Netscape and Explorer. We witnessed the search engine wars of Yahoo and Google. We started to shop on global online marketplaces such as e-Bay and Amazon. It was the era of the H2H digital platforms, where human-to-human electronic transactions were made possible on a worldwide scale.

The Third Wave has already started. It is pervasive, yet not obvious enough for us to be overwhelmed by it. The Third Wave is gathering momentum through the IoT, a network of Smart Objects that can be sensed, controlled and managed through the Internet. We expect to have Smart Objects in industry sectors as wide as fitness, healthcare, retailing, transportation, education, connected homes and smart cities. The IoT will merge two worlds - the physical world and the digital world.

Reports by Gartner estimate that there will be 25 billion objects connected and managed over the Internet by the year 2020. To give a sense of the scale of this prediction, there are currently 6.8 billion connected mobile phones in the world,

just short of the 7 billion figure of the Earth's population. The IoT will interconnect a population of Smart Objects over three times the size of the human population.

The IoT is being popularised by the current trend in wearables, led by brand names such as Jawbone, Polar and Fitbit, which has a market capitalisation value of 5.8 billion USD. Activity trackers are worn or integrated into our smartwatches, to measure our movement, pulse rates, postures and even hydration levels. They communicate with the Internet, upload information to our mobile phones and keep track of our physical condition. Adhesive wearables the size of small skin plasters are already developed to facilitate the remote sensing of patients, in and out of hospitals.

The drivers of the IoT are the new generation of microprocessors that are high volume, low energy, low cost and disposable. Semiconductor companies are producing microchips that are 2mm in size, the size of the tip of a fingernail, costing 50 cents to €1.50. We can envisage the extensive utilisation of this affordable technology.

Other applications of the IoT will be found in the industry for the management of heating, ventilation, air-conditioning, points of sales, smart electricity grids, parking spaces or traffic congestion. IoT will help us manage our homes' energy consumption and home security. There is a revolution in the Insurance Industry, with pilot studies already happening locally. Trackers are placed in cars to measure the use or misuse of our vehicles. The data is transmitted on the internet to the insurance company, which in turn will calculate future insurance premia based on usage and safe driving. Other IoT applications in transportation are related to asset tracking of public transport and private cars.

The Sharing Economy, also known as the Collaborative Economy, is another phenomenon. We are already experiencing the many-to-many business model, which Amazon, E-Bay and Alibaba have been using for some time. When Amazon started out with a B2C (business-to-consumer) model selling publishers' books to individuals, it did not make a profit. It started generating profit when it moved to a C2C (consumer-to-consumer) model enabling many consumers to sell their books to many other consumers around the globe.

We are observing another interesting dynamic in the Sharing Economy: the rise of the Excess Capacity Business Model, where we take stock of excess resources that we no longer need and reallocate them to other users. We are already doing this via eBay for second-hand goods. Local economies with excess properties are benefitting from accommodation platforms such as Airbnb for the rental of holiday homes. Another platform, Lyft encourages car-pooling utilising empty car space. If we all shared a car with one other person on the way to work, there would be half the number of cars on our roads during the ever-expanding rush hour. Uber has disrupted the taxi industry by pooling the excess capacity of private drivers and taxi services on one platform, making them readily available on smartphones in many cities.

The Sharing Economy is affecting the manner in which we manage excess capacity, how we reduce it and how we utilise it efficiently. We can rationalise how we use extra office space, transportation, warehouse storage and building materials. When we merge the technology of the Internet of Things and the Excess Capacity Business Model we move towards the 'Uberisation' of everything. We combine technology to manage resources using car locators, automated property locks, ground and building sites drones to monitor, control and reorganise utilisation.

There are new organisational models, which are unusual, bizarre and unprecedented. For example - the largest media platform in the world, Facebook does not own any content. The largest taxi company in the world, Uber, does not own any cars. The highest valued retailer in the world, Alibaba does not own any stock. The largest accommodation platform, Airbnb does not own any properties. Large scale businesses have become possible without large scale investment in physical assets.

How will IoT and the Sharing Economy affect human capital, jobs, skills and future careers? We are experiencing the rapid emergence of crowd working formations that have already been adopted by innovative IT and Fintech companies. Companies are telling us that "we do not need a company but that we need eco-systems of workers". We are observing distributed tele-cooperative networks of internal and external people performing jobs that used to be fulfilled internally. We are seeing the replacement of traditional company hierarchies and the rise of cooperation networks that transcend towns, cities and regions.

Crowdsourcing of suppliers is also on the rise. There are open calls for tenders and suppliers over the internet using innovative apps. The practice is widely used by the IT and R&D industries. Examples would be the use of Freelancer.com and Fiver.com for the sourcing of IT and communication services; sourcing high-tech R&D services via Innocentive.com; testing anything from artificial intelligence (AI) applications to new websites on Amazon Mechanical Turks mturk.com, and raising capital for business ventures over KickStarter.com.

The efficient use of resources and the excess capacity business model imply that there will be less demand for low value-adding jobs that are related to redundant processes and resources. We may see the end of rubber stamp jobs perpetuated by bureaucracy. The decrease in the need for certain jobs will be more than compensated by the increase in the demand for new IoT skills, in technology and supporting services such as management, marketing, finance, accounting and regulation.

The World Bank predicts that there will be two million unfilled technology jobs globally in the next ten years. These are not necessarily pure IT Jobs – they include hybrid competencies in finance, banking, accounting, in managing creative teams and in driving innovation. There will be a significant demand for jobs in business intelligence, big data analytics, lower level number crunching, information security and user interfaces design, whereby screens will no longer remain rectangular but will become ergonomically designed for wearables.

Our careers in traditional professions will require more knowledge of technology tools and technology management for us to be competitive in our industries. We will experience a demand for hybrid skills and competencies. Whilst twenty years ago it was uncommon for a professional in accounting, public policy, banking or finance to require any form of technology knowledge, today graduates are likely to be hired faster and to attract higher salaries if they demonstrate a very basic understanding of SQL, PHP, HTML, Java, HBase, Windows Azure or AWS (Amazon Web Services).

There are many ways to continue developing our competencies post-graduation. There are many online platforms that can provide for our continuous professional education and to help us catch up with the deluge of opportunities presented to us by IoT and the Sharing Economy.

Learning never stops and will continue post-graduation if we are ambitious regarding the economic competition. We can strive to evolve in our jobs, in our careers, and we will continue to evolve as industries grow and flourish around us. We are privileged to be living at a time when the global economy is moving forward and technology is taking us in new and exciting directions. Let us keep in mind a critical maxim for success - when resources are limited, the possibilities are endless.

(The speech content is based on market adoption research of network products, which is published in part in the Wiley Encyclopaedia of Management, Vol 12 Strategic Management of which Professor Sammut-Bonnici is Joint Editor.)

Bio-note

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High Quality Teaching in Higher Education: A Challenge and a Possibility

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Abstract

A shared concern in higher education establishments is the quality of teaching taking place and thereby, the quality of students leaving the college/university. While keeping in mind that quality cannot be easily defined, this paper aims to raise awareness on a number of challenges which could be impinging on the quality of education in the higher education sector. There are a number of external factors which could be attributed to the quality of teaching. However, the focus of this paper is limited to the teaching and learning process in the higher education classroom setting.

In the first section of the paper, the author raises awareness on the dynamic and complex nature of the teaching and learning process which could be affecting the quality of education in the higher education classroom. The emphasis is on the main stakeholders - the lecturers and the students – and the relationship between the two. Next, the author outlines a number of challenges which could be affecting the process. The aim is to reflect upon the teaching and learning that go on in the higher education classroom, so as to be able to align future actions. Finally, the author proposes concrete practices which can be adopted in order to overcome the challenges and improve the quality of teaching, and thereby, the quality of students leaving higher education. High quality teaching in a higher education classroom has got its challenges but it is a possibility.

Keywords: *high quality teaching, higher education, teaching-learning process, challenges.*

Quality in Higher Education

Quality in higher education is a multidimensional term (Elton 1998, Krause, 2012) which cannot be easily defined (Brockerhoff, Huisman, & Laufer 2015). It is perceived differently by the stakeholders working within the education system (Dicker et al., 2018): while employers value most highly personal qualities, students and staff rate the quality of teaching and learning, feedback, and staff-student relationships as important factors in high quality teaching.

It is the aim of this paper to reflect upon the quality of the teaching and learning process in the higher education classroom, share the challenges which could be affecting this process, and suggest concrete applications of quality teaching initiatives which can be adopted in order to improve the quality of teaching, and thereby, the quality of students leaving higher education.

The roles of the main stakeholders and the setting in which they function

The teaching and learning process in a higher education classroom is a complex one which directly involves the dynamics taking place between the two main stakeholders – the lecturers and the students. In my attempt to raise awareness on our practices, in order to be able to audit our role in the classroom so as to improve the quality of our teaching, I can neither separate the lecturer from the student nor the teaching from the learning since one cannot exist or take place without the other as they are both mutually dependent on one another. It is this same dynamic nature of the teaching-learning process that makes the discussion on the topic tricky; separating the different workings of the process for discussion's sake can give the impression that they can function in isolation.

In my attempt to outline the challenges that could be hindering the quality of teaching in the higher education classroom, I would like to first start with an attempt not to define, but to look into the multifaceted roles of the main stakeholders, these being, I believe, the key factors which are impinging on the quality of teaching in higher education.

Lecturers

The key stakeholder in the teaching and learning process who can assure high quality teaching is definitely the lecturer. It is said that the good performance of students depends upon the effective teaching of their teachers (Sanders and Rivers, 1996) and, whilst keeping in mind that one of the challenges in educational research is that of measuring the teacher's effectiveness one cannot but acknowledge that lecturers play a crucial role in this process; they are the main protagonists of the quality of teaching which takes place. It is with their quality and their competence that lecturers can enhance the teaching and learning that take place in the classroom.

Apart from pursuing excellence in their subject and in their teaching so as to assure quality education, lecturers working in higher education are encouraged to engage in other activities relating to the college and/or university in which they teach. The ever changing demands being made on them could be affecting their performance and, in turn, the learning taking place. However, for the sake of the paper and its constraints, I have limited my discussion to the challenges lecturers face in the classroom.

The Role of the Lecturer

The role of the lecturer is a complex one, one which is definitely not limited to the actual teaching of one's subject and although a common perception is that the lecturer in the higher education classroom simply imparts knowledge on the students, the reality is that if high quality teaching is to be assured, the role of the lecturer should be much wider.

It is the multidimensional role of the lecturer who must function on so many levels in the classroom that could be affecting the teaching taking place. Unless lecturers recognise, accept, and embrace this role and the load it comes with, the quality of education cannot improve. Furthermore, for high quality teaching to take place, lecturers cannot remain distant from their audience. They need to play an effective role to understand, facilitate and improve the teaching and learning. The importance of the interaction between the lecturers and the students cannot be emphasized enough. Besides, apart from the preparation and planning of lectures, which must take place with the students in mind, lecturers need to continuously make evaluations of the instruction and communication, of the learning taking place, during the actual delivery of the lecture. Lecturers need to check if their teaching is effective, if the message is reaching the students, which brings us to yet another challenge in the teaching-learning process: *how* and *when* this can be done, which will be tackled at a later stage.

It is clear that the multifaceted role of the lecturer inside the classroom is one which necessitates the lecturer to go beyond the area of expertise and demands skills most of us might not even have had training in. Teaching in a high education setting is, without doubt, a challenge. The time and energy needed to deliver effectively could be affecting the attitude towards the students, and thereby, the quality of teaching taking place.

The Students

The other protagonists who could be impacting on the teaching-learning process at this level of education are the students themselves, our target audience, and if, as we have already established, lectures should be prepared and delivered with the students in mind, perhaps the biggest next challenge we face is getting to *know* them, *how* we are going to do it, and *when*.

If we had to take a higher education college as an example, perhaps the only knowledge or assurance lecturers have about their students is that the great majority have completed secondary school and they have the entry requirements to attend college, and that most, though not all, have come to follow a course of study which leads to their certificate, diploma, or degree. Their role should be simple: to follow the programme of studies, attend lectures, hand in assessment tasks, study, and sit

for exams by the end of which their efforts are rewarded. If one had to stop here, then, the role of the lecturer would be straightforward: a homogeneous audience of students with the same objective.

This is not, however, the reality lecturers are faced with in the higher education classroom: the audience cannot be more heterogeneous. Students come from different backgrounds, have experienced learning environments which are equally diverse, have different preferred learning patterns, varied abilities, skills, interests, and are at a level of maturity which varies from student to student. A good number juggle between school life and work, and/or other commitments. Furthermore, the fact that the students we work with are at the critical and sensitive age between puberty and adulthood, it is not surprising that understanding their needs and frame of mind can be baffling.

The quality of teaching and learning can never be of high quality unless we learn how to 'listen' to the students. Teaching cannot be successful unless we address their needs and/or learn about what motivates and engages them in the lesson. Getting to know the students can be a challenge but it is definitely not impossible. Lecturers need to evaluate the students' reactions to what is being taught, look for cues, and read their body language. Forming a relationship with the students is one way of overcoming this challenge. The reality is that lecturers can no longer walk into a class and deliver the contents without engaging students if they want effective teaching to take place and if high quality teaching is to materialise.

The Higher Education Classroom Setting

Lectures: large group teaching

Another aspect which could be affecting the quality of teaching taking place in higher education is definitely the structure within which learning occurs. Lectures, which mainly consist of classes with relatively large groups of students, are one of the main structures in which the teaching-learning is done in higher education.

Large classes can be a challenge for both the lecturer and the students. Firstly, apart from the expertise in the subject being taught, lecturers need confidence, skill, mastery, and awareness of the surroundings, of the learning in process (or not) for high quality teaching to take place. Secondly, forming a relationship with the students in classes with a large number of students can be a daunting task for some. Another reason why the teaching-learning process could be affected is because it can take students some time to adjust to these new classroom settings, and in the process lose focus and interest, which can have repercussions on the whole programme of study. It is up to the lecturers to generate and maintain interest, and engage students in a lecture setting. This can definitely be a challenge, one which needs to be addressed if lecturers are to assure high quality teaching in

higher education. Another challenge for the lecturer, though less frequent in higher education, could be the disruptions in the class. We know that the use of technology has almost become a must, and the continuous use of gadgets by students during lectures can be a distraction to students and lecturer alike.

Seminars and Tutorials

Seminars and tutorials are two other classroom settings offered in higher education to provide effective reinforcement to large group teaching. They also present opportunities for lecturers to provide a space where students' ideas and intellectual development may be nurtured by way of discussion and reflection. Small group teaching is also an ideal setting to get to know the students. Unlike the lecture, seminars and tutorials should not be the place for 'input' but rather a place for guidance (Fry, Ketteridge, & Marshall, 2008). The latter can prove to be a challenge for lecturers who are reluctant to take a step back from lecturing, and who feel the need to continuously 'impart knowledge'. Students need 'spaces' where they can show lecturers that they are learning; seminars and tutorials are the spaces where this can be done.

The type of feedback given to students on the tasks assigned can also be a challenge which could be affecting the learning process. Lecturers have doubts about how much and how feedback should be given, whether it should be written or delivered face to face, or both. To provide written feedback is time consuming but definitely worthwhile if done properly. However, once again, we have doubts on whether our students take the feedback on board, whether they get disheartened by the amount of feedback or the grade given. How effective the feedback lecturers give their students is, will remain a mystery unless lecturers take a step further and ask students for their opinion on the feedback they are given, on the teaching and learning process.

Factors affecting the quality of teaching

The role of the lecturer, the students' cohort, the dynamics between the two, the demands made on the students and the lecturers, the feedback given and the setting in which learning takes place in higher education, could be contributing to the quality of teaching. I have established that in today's context, walking into a higher education classroom and imparting knowledge for a whole hour will not result in high quality teaching and learning. A teacher-centred classroom is not conducive to effective teaching and learning. Rather, an effective higher education teacher is one who is focused on the learning taking place in the classroom.

I have attempted to raise awareness of some of the challenges involved in the process. In the following section, I will suggest ways in which the quality of the teaching and learning process in the higher education classroom can be improved.

Suggestions for Quality Teaching Practices

Get to know the students

One practice I have been using in both small and large classes in order to get to know the students is to distribute a short questionnaire in the very first week of the programme of study. The main aim is to make the students think about the choice they have made, to see why the students have chosen to further their studies in the subject and if they have an idea as to what the programme of study entails. It always turns out to be a good ice breaker which raises the students' awareness about their attitude towards the subject they will be studying. It also provides the lecturer with information about the audience: insights into students' conceptions are one of the foundations of successful curriculum development, class teaching, and valid assessment methods (Ramsden, 1992).

Make students aware of the learning taking place

Another practice which could improve the quality of teaching in class is to make students aware of the learning which is taking place. At the beginning of the programme of studies, lecturers should provide students with an overview of the course of study, project the syllabus together with the learning objectives which they must be able to master by the end of the two-year course. 'Ticking' the skills/topics they master on the way is also a good way to show students that they have progressed and how closer they are to the end. Some of the students might have chosen the subject being taught without any idea of what it involves; I have found that showing them which skills they have grasped, where they are heading to and the skills left to master is a good way to encourage focus, confidence, achievement, and direction.

Check students' understanding

Another practice which is conducive to enhancing learning is that of continuously checking if students are understanding. We have already established that students can get lost unless engaged in the subject, how easy it is that they remain passive listeners, that they become invisible in a large class. It is with this awareness in mind that I find myself asking, at intervals, if students are following, if they are lost and whether I can move on to the next step in my lecture.

Give students time to process information and show what they have learnt

Providing students with time to think in order to be able to process the information, and, where necessary, apply the new skills, are also practices to be encouraged. It is the responsibility of lecturers not only to create opportunities for students to show that they have learned a concept or skill but also to provide feedback on their performance. In this way, both the lecturers and the students can act on the feedback given. This also sheds light on the importance of frequent assessment tasks; leaving the latter to the end of the term can be too late. Feedback should be sought by both stakeholders regularly if high quality learning is to be assured.

Break lectures into smaller chunks

One other practice I have been adopting in these last few years is to make sure that one-hour lectures are broken down, as far as possible, into smaller chunks, alternating between delivery of new material, semi-informal discussions, and short tasks to check understanding. Lectures during which I talk for the whole hour have become a rarity in my teaching. In this way, I try to make sure students are actively involved in the learning process.

Repeat success criteria, important theories, diction

Another successful approach is that of constantly reminding students of the success criteria for assessment. While delivering my lectures, I also put emphasis on, and make sure that I frequently use diction and phrases which students are encouraged to use in their writing.

Remind students about brain processing

Students also need to be constantly reminded that the learning of content and that of skills requires different brain processing. It is important to engage students, to bring to their attention the process the brain goes through to learn skills etc., so as to facilitate retention. A misconception on the part of many students furthering their higher education is their belief that a subject consists only of large amounts of factual knowledge or a mastery of steps or rules, and that, in order to become the expert, all one needs to do is add knowledge to one's existing store. It is the responsibility of the lecturer to challenge and change such limited conceptions, and to ensure that their teaching, the curricula they design, and the assessments they set, take students into more stretching areas such as critical thinking, creativity and synthesis. (Biggs, 1999).

Focus on what the students do

The main focus should be on what the students do. Students must be actively involved and engaged if learning is to take place. It is through their output, tasks and assessments assigned that lecturers can make sure that students have learned, that the learning objectives have been met. It is then up to the lecturer to 'align' (Biggs, 1999) the teaching and approaches to the feedback elicited from the students' output/performance.

Ask for feedback

Finally, a practice which has become standard in my teaching, is to ask students for feedback on the teaching and learning which takes place during my lectures, seminars, and tutorials. This is done through the use of a structured questionnaire. The responses provide an insight into the teaching and learning, what appealed to students, what worked, and what could have been done better. The questionnaire also provides students with opportunities to make suggestions on what could be done to further improve the quality of the teaching and learning. The feedback is taken on board, and future lectures and methodologies are modified accordingly to maximise the quality of teaching. This can be a challenge for a number of lecturers. However, if students are to be provided with high quality education, their feedback should be sought.

Discussion and Conclusion

This paper was written with the awareness that researchers are still struggling to understand the causal link between the lecturers' engagement in teaching and the learning which takes place, and that institutions still find it difficult to demonstrate the direct impact of the lecturers on the quality of education students get in higher education. However, my years of experience in the classroom, literature, and the data collected from feedback I receive from students on the teaching and learning that take place in my lectures, all point to a number of factors which could be attributed to the quality of teaching in the higher education classroom.

The discussion was limited to a number of factors which could be affecting the quality of teaching in the higher education classroom. I have convincingly argued that the teaching-learning process is a dynamic process which cannot be easily assessed since it combines various determinants, among which the skills of lecturers, the students' experience, the quality of the relationship between students and the lecturer, the students' engagement, the tasks and feedback given and the setting in which learning takes place. It is the nature of this dynamic process which makes teaching at this level challenging.

High Quality Teaching in Higher Education: A Challenge and a Possibility

High quality teaching in a higher education classroom can be challenging but not impossible. Among the critical components for high quality teaching we find: teaching methods and strategies used to facilitate student learning, a student-centred classroom, interactions which encourage interest, engagement and confidence and tasks assigned to check students' learning. The study also highlights the importance of the constant need for feedback to be able to review methods, pedagogies, and the learning taking place in the classroom. Ultimately, high quality teaching is possible if the teaching that is done in the higher education classroom, is planned and delivered with the valuable data collected from the students' feedback in mind, hence the importance of regular and appropriate evaluation on which to make future decisions. For high quality teaching in a higher education classroom to materialise, for effective learning to take place, lecturers are encouraged to align their practices to what the students do (Briggs, 1999).

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Social Capital, Health and Place: The Two Sides of the Same Coin

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Abstract

Research on social capital, health and place has increasingly expanded, however relatively little research has explored how social capital can impact on health both in a positive and negative manner, within a place. There is a general understanding that features of social cohesion, bonding, reciprocity ties, and trust operating within a place all help to increase positive health and wellbeing. Yet, very few studies analyse that the theory of social capital in practice has its risks and can be damaging for the health and wellbeing of individuals. This study, through qualitative in-depth interviews, explores how social capital is truly beneficial for the health and wellbeing of certain social groups, and argues that it may not always be the case that a deprived neighbourhood suffers from low social cohesion. However, this study brings out more to the attention that these same features of social capital can exert negative effects through features of social exclusion, reporting, jealousy and antisocial behaviour.

Keywords: *wellbeing, positive, negative, neighbourhood processes.*

Introduction

The relationship between social capital and health has increased in importance to the extent that it is considered a subfield of social, epidemiological research. Yet, the studies focusing on the relational neighbourhood processes by which social capital affects health and wellbeing are limited. This study aims to explore the local neighbourhood processes related to the theory of social capital and find how the effects of social capital occurring within a place, may not always operate for the benefit of the health and wellbeing of individuals.

Defining social capital

The different theories in relation to social capital analysed below show aspects of normative social capital including bonding, reciprocity ties, networks and trust. The

'dark side' of social capital, although given less importance in the literature, was also examined, as for this research the negative side of social capital is considered as equally influential on health and wellbeing as is the positive side.

Definitions of social capital have been debated and refined by social scientists from various disciplines, with major contributions coming from sociology (Bourdieu, 1986; Coleman, 1990), and economic and political sciences (Fukuyama, 1999; Putnam, 2000). Coleman (1990) defines social capital with reference to the 'rational choice theory'. Sociologists and political scientists explain this theory by stating that all actions of individuals are fundamentally 'rational' and that people calculate the likely costs and benefits of any action before deciding what best to do (Scott, 2000).

Coleman gives importance to human agency rather than to the pre-determinism of structure. He argues that social capital involves an expectation of reciprocity within networks, characterised by high degrees of trust and shared values (Uphoff et al., 2013). According to Coleman, social capital constitutes a public good, benefiting all those who are part of a community and is a potential asset for the underprivileged and not just an instrument of privilege.

Putnam regards social capital above all as a 'normative' attribute of society, implying that all those in a society recognize and share the benefits of social networks and the norms of reciprocity and trustworthiness that arise from them (Putnam, 1996; Putnam, 2000). For Putnam social capital is the "networks, norms, and trust that enable participants to act together more effectively to pursue shared objectives" (Putnam, 1995, pp.664-665). Putnam emphasises *Bonding* social capital, which comprises close connections among homogenous groups such as family members and close friends, for 'getting by' in life. Bonding is also very much related to trust, as a close-knit bonded community instils among its members' feelings of trust and security. *Reciprocity* is a feature of social capital which is experienced in societies in the presence of positive social norms. Moreover, reciprocity ties form different networks and an individual can belong to more than one network at once, such as familial, religious or cultural networks. Close knit networks such as extended families and homogeneous neighbours tend to be dense and are associated with features of high reciprocal aid. When people within the network are heterogeneous and have weak ties between them, the networks may be sparse.

Wilkinson and Marmot (2003) also explain that these aspects of social capital influence inequalities in health at multiple levels. At a personal level, social capital can buffer the effects of stress through emotional or material support. It has been argued that unfortunate events in one's life may be perceived less stressful when one feels supported. Therefore the negative health effects arising from poverty may be reduced by the positive effects of social networks.

As previously discussed, social capital has many beneficial features, yet few commentators have pointed out that there is also a 'darker side' of social capital. The adverse effects of social capital have not been given sufficient attention in the work of the main theorists of social capital (Cox & Caldwell, 2000) and especially

in the work of Putnam, whose proposition is that all members of society benefit through strong social capital (Halpern, 1999; Durlauf, 1999).

However, some critics have insisted that the properties of social networks are not necessarily always good for a community (Portes and Landolt, 1996) or for all of its members (Muntaner & Lynch, 1999). In fact, individual inhabitants may be subordinated while outsiders may find it difficult to form part of the group and gain access (Twigg & Mohan, 2009). High levels of bonding and trust among some groups in a community can create the possibility of excluding and segregating others (Stole, 1998). This will result in social cohesion being achieved only at a micro level and not across the wider society. There may also be mechanisms of social control that exclude those who are not adhering to the social norms of the majority (Arneil, 2006).

Methodology

This study, through in-depth interviews, explores the lived experiences of families living in a deprived, traditional neighbourhood. The choice of a traditional town in Malta addresses my research objective by observing features of social capital and neighbourhoods deprived of economic and educational resources, also tending to be deficient in health-promoting social resources. A sample of twenty families was chosen. All the respondents are anonymised. Ethical approval was obtained from Durham University where the author was affiliated at the time of research. In order to recruit the sample, the author participated in local activities, so that trust could be gained. Permission for interviews was obtained, with written consent to conduct the interview. Due to the sensitivity of the topic, it was felt that the names of the neighbourhoods remain anonymous in order to protect the identity of the informants. The narratives were transcribed, and an 'open coding' approach was used for the analysis of this study.

Analysis

This section starts by emphasising the importance of social relations formed when people daily engage within their public spaces that is recognised as a benefit to wellbeing (Cattell et al., 2008). It is not necessarily the case that all deprived areas suffer from lack of social cohesion or a depleted store of social capital (Cattell & Evans, 1999). Cattell (2001) argues that inequality and deprivation can co-exist with features of solidarity (Frankenberg, 1996). Some generate positive effects on health and wellbeing due to reciprocity ties and networks. However, the following section explores how these features of social capital also generate negative experiences to the inhabitants and greatly harm their health and wellbeing.

Berkman and Glass (2000) assert that involvement in social networks provides various forms of social support (such as emotional, instrumental and appraisal support) that affect health through psychosocial, behavioural and material pathways. These forms of support may reduce stress by functioning as “buffering factors” (Bartley et al., 2004). Many of the respondents’ stories illustrate that a caring, local community can work positively in building beneficial, social capital amongst residents in disadvantaged neighbourhoods (Cattell, 2001). Thus, social capital may be present in the deprived neighbourhoods studied here, operating in ways similar to those proposed by Coleman (1990) and Putnam (1993) who argue that social capital comprises social structures associated with levels of interpersonal trust and norms or reciprocity and mutual aid. These act as resources for individuals to facilitate collective action.

Many of the interviewees from traditional neighbourhoods stated that simply chatting with friends is important for them as a form of support. *In this way I know what is going on around and do not feel excluded from the rest. (Agnes).*

Other respondents recount that there are neighbours who are ready to offer gratuitous help. Patricia’s neighbour spends much of her time unoccupied, near the doorstep and always available and ready to give a helping hand, *‘neighbours are often a godsend’*. Patricia recalls that when her children were still babies, her neighbour willingly ran errands for her, *‘she would ask me, ‘Do you need something?’ or ‘Would you like me to buy milk and bread for you? Thank god I always find her when in need (Patricia).*

Joanne narrated that when she was sick and could not go out, her neighbours helped her and she is really appreciative of the sense of community spirit present in her neighbourhood. *When I had back pains after the operation, they used to ask me everyday, ‘How are you? If you want, I can send you my children to run errands for you (Joanne).*

The idea of reciprocity does not suggest a *‘giving like for like’ mentality but is rather the expectation that ‘good deeds will not go unrewarded’* (Putnam, 1993, p.171). It is assumed that amongst the neighbours, good deeds, though not necessarily rewarded in the short term, will nevertheless be re-paid at some unknown point in the future.

Portes (1998), referring back to the theorists Marx, Simmel and Durkheim, argues that people can be willing to make resources available due to internalized norms of proper behaviour, or through solidarity with people who may share a ‘common fate’. Therefore, being part of a strong social network is beneficial for one’s health (Kawachi and Berkman, 2001). Social ties are associated with lower levels of depression and higher immunity against various diseases (Cohen and Syme, 1985). As Patricia and Joanne have pointed out, social support, being emotional, practical or instrumental, has a positive influence on health and wellbeing. Moreover, other studies have also shown that these kinds of social networks not only provide sociability but can enhance self-esteem and self-identity due to feelings of belonging and coherence (Allan, 1996).

Tönnies (1887) defined these neighbourhood processes as ‘*Gemeinschaft*’ characterised as typical of ‘folk’ society, where there is cooperation to achieve group outcomes and thus the relationship between the community is very strong. This was defined as the theoretical starting point for community studies, where ‘*close positive interaction based on kinship, local proximity and mental connection*’ occurs (Liepins, 2000, p.24).

Other respondents too, describe how the level of social support creates trust among members of their neighbourhood. Mounira, explains how her neighbourhood, though being the ‘worst’ neighbourhood one can live in with regards to deprivation and social disorder finds that the neighbours are caring towards each other, can put their difficulties aside and are ready to go out of their way for the benefit of their neighbours. This points out that neighbourhood disorder and low levels of trust may not always be necessarily linked.

I find that the people of [her neighbourhood] are the best! It is true that many blaspheme and are quarrelsome. It is true that Maltese label them, but you would not believe that they are the kindest people I have ever met, even better than any others living elsewhere in Malta! Each neighbour asks you, ‘How are you?’ Even though actually they would not be able to help you’ (Mounira).

These stories match with the findings of Cattell (2012) who focused on the Eastenders of London and stated that in their deprived neighbourhood they are “friendly people, always ready to help each other” and “rough and ready” (Cattell, 2012, p.92).

Negative features of social capital

It is important to emphasize that social capital can have negative as well as positive consequences. When compared to the amount of research focusing on the positive side of social capital, the negative side of social capital is relatively under-researched. Several respondents in this study mentioned instances of exclusion in their neighbourhood when the social network made demands of conformity on them, which they could not meet. This imposed social control and limited their individual freedom. Thus, while traditional social bonding may be beneficial, negative features of social capital may co-exist with positive ones, as discussed below.

Discussing reciprocity and bonding, the ‘eyes on the street’ by Jacobs (1961) relate to the traditional norm of reciprocity and mutual aid, however for others it is looked upon as intrusion. This latter group fear that when they bond with their neighbours they create a level of familiarity, so their perceived shortcomings and limitations may be exposed to others through gossip and criticism which is undermining the benefit of social capital. Therefore, the traditional neighbourhood

provides the ideal environment not only for support and bonding but also for intrusion and interference to occur. Marouska recounts *'Our neighbour stays out on the balcony from early morning till late in the evening! It's not that she is going to see me do anything wrong! The fact that you go out and you come back and she is still there watching and observing. What a lack of freedom!*

Other respondents argue that it is only natural that being continuously observed leads to being talked about and being the subject of gossip. Some of the respondents disclosed that the worst form of negative social capital is when they are verbally harassed and abused in public by the very people with whom they are neighbours. Nadia, recounts instances of how her neighbours insulted her about her extra-marital relationship with another man. When her neighbours saw her entering her boyfriend's car, they uttered *'Concubine'* and other offending words. This constrained her to keep aloof from her neighbours and never ever to chat with them again. Nadia felt so frustrated about this incident regarding her reputation.

Another manner in which 'eyes on the street' affect the respondents negatively is described by Priscilla and Agnes. They narrate how the gossip in their neighbourhood has reached the point that the neighbours report on each other to the authorities. Some parents discovered that they can make good financial use of the social security system by registering themselves as single parents in order to receive single parent benefits, but at the same time cohabit with a partner. This abuse can only be stopped by the authorities through reports by the public as the social workers cannot do random searches in all the single parent households in the neighbourhood. In fact, one of the female neighbours was caught living with a partner and lost her benefits because she was reported to the authorities. Then all the other neighbours started being vigilant over one another and the level of trust between them started to diminish.

Priscilla states that her house was raided by the social security officers in the early hours of the morning in search of valid evidence of her cohabiting status. Both Priscilla and Agnes feel irritated because the neighbours have been empowered to monitor one another's behaviour and report them to the authorities if they are breaking the rules for welfare eligibility. Agnes explains that her neighbours are generally helpful but when they know that one is faring well, jealousy sets in. Moreover, authorities are abusing of the presence of bonding and social interaction in the neighbourhood by encouraging inhabitants to report on each other. In this manner, the authorities are indirectly assisting in harming the existing social capital. *The social security officers call at your house only because someone has reported you. The last time they came, one of them told me, "You have been reported by someone..!" The lady who reported me was herself reported by others and as she has lost all her benefits, she now wants to ruin others but I have discovered who she is because people talk!* (Priscilla) This shows how judgemental neighbours can be when they are aware of each other's daily activities.

Paradoxically, high levels of bonding and trust can also create elements of anti-social behaviour which may not be reported to the authorities. The respondents have disclosed that when the community is bonded together they feel that they should not divulge information about certain activities especially criminal ones to the authorities. Therefore, social capital creates a code of silence about activities related to theft, drug misuse and trafficking. Some respondents fear that if they report this criminal activity to the authorities, the community would take revenge on them and exclude them.

Priscilla continues to argue that the police seem to have lost control of the situation. The respondents attributed this to the fact that often drug pushers and other criminals finance the electoral campaigns of political parties to gain power. The police, faced with these criminals who are affiliated with high ranking, powerful people, are seen as helpless and weak. *The situation has gone to the extent that instead of these delinquents fearing the police, it is the police who are afraid of them.*

Conclusion

This paper adds to the reasoning that neighbourhood social processes are complex since positive features of social capital can occur simultaneously with negative effects in the neighbourhood. It emerged that experiences reported by the respondents foster characteristics of normative social capital with features of bonding, reciprocity, ties and trust. Yet, it has manifested how much the positive features of social cohesion can even result in intrusion, jealousy and social control. Although in theory social capital is beneficial for the health and wellbeing of inhabitants, in reality there can also be a number of negative effects on the health and wellbeing of some groups of inhabitants. This study depicts that there is a fine line between how social capital can have negative as well as positive effects. Thus, as well as enhancing the health and wellbeing of the inhabitants, it can also be the agent of ill-health and lack of wellbeing.

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Bio-note

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Rail, Rivers, Road or Air: Which infrastructure promotes growth in China?

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Abstract

We examine the relationship between growth in transportation and economic output across Chinese provinces from 2005-2014. Panel GMM methods evaluate the impact of changes in air, conventional rail, HSR, roads, and waterways turnover volume on provincial output growth. GMM estimates demonstrate that rail and roads significantly affect economic growth; rail's impact is particularly significant and its estimates are economically large for agriculture and manufacturing output. In contrast, air, HSR and water usage do not contribute to economic growth. Impulse responses indicate that rail and roads considerably affect GDP growth across China, and there is bi-causality between transportation and economic growth. Cost-benefit analysis highlights that the benefit of roads, and particularly rail, outweigh the costs of infrastructure spending.

Introduction

China's investment in infrastructure has skyrocketed more than five times over the past ten years. A decade ago, China spent 40% of the combined G7 infrastructure spending on roads, rail and air; however, by 2016, China's infrastructure budget was 2.5 times the G7 (OECD, 2016). Has this remarkable boost in fixed investment of transportation produced increases in freight and passengers that have contributed to economic growth in China? High-speed rail (HSR) particularly has been prioritized; it began full-scale operation in 2008 and by 2015, China had more tracks than the rest of the world combined. The rapid buildup of Chinese HSR began in 2008 when China laid out the blueprint for building 4-vertical and 4-horizontal corridors. A decade later, the network extended to 29 Chinese provinces and reached 26,000 km, accounting for two-thirds of global HSR tracks. By 2020, 192 prefecture-level Chinese cities will be connected by 30,000 HSR tracks for a cost of 3.5 trillion RMB; by 2025, a new 8x8 rail network will comprise nearly 40,000 km of track and cover most major Chinese cities (UIC, 2018; Lu, 2018).

Over the past twenty-five years, China has also invested heavily in air infrastructure. The number of civil airports in China increased from 94 in 1990 to 175 in 2010 and reached 229 by 2017. In 2016, the government announced plans

to invest 77 billion yuan annually to promote air infrastructure that will boost the number of airports to 272 within five years; the investment will support eleven large infrastructure projects and 52 extensive upgrades on civil aviation facilities (Liu, 2016). In contrast, the last major U.S. airport was built more than two decades ago in Denver, and there are no new airports on the drawing board (Modak, 2017). Has the government's fixed investment in HSR and air, nontraditional infrastructure investment, contributed to China's rapid economic growth?

The case for infrastructure spending for promoting economic activity is well documented in the literature but has received recent scrutiny due to high costs. While some research supports a positive diffusion effect through more spatially balanced economic development and employment distribution (Sasaki, 1997), agglomeration effects also are espoused by geographical economists (e.g., Fujita et al., 1999). In contrast, Ansar et al. (2016) show that China's infrastructure record has failed to boost economic growth beyond the construction phase. The rapid buildup of HSR and airports has renewed the issue of possible government misallocation in China. China's Railway's total debt stands at five trillion (RMB), and 80 percent of the debt is related to HSR. Mitchell & Liu (2018) report that the HSR network is a debt crisis waiting to happen; the network is dependent on unsustainable government subsidies with many rail lines unable to repay the interest on the debt, let alone its principal. Airport investment may also be overbuilt; of 183 airports in operation across the country, 134 were deficit-ridden facilities of branch airlines with losses totaling 2.9 billion yuan or US\$474.15 million (China.org, 2014). By 2017, China has too many airports with few passengers as three-quarters of its 200-plus airports are unprofitable. (Huifeng, 2017).

Banerjee et al. (2012) argue that a key component in evaluating infrastructure's effects on economic growth is appropriately modeling causality; for instance, although rich economies have dramatically better transport networks than poorer economies, market forces may have naturally provided the impetus for the investment. A second concern is whether the government selects the appropriate infrastructure to promote. Seminal work by Fogel (1962) shows that although rail was often cited as an essential tool of government in promoting economic growth in the 1800s, it was an example of government misallocation, since it was less effective in enhancing economic growth than pre-existing river networks.

Tong and Yu (2018, page 120) report that despite both sizeable political support and financial investment in transportation network, "little is understood regarding the relationship between transportation and regional economic growth in China." They survey the literature on China's transportation infrastructure and find few empirical studies that examined the interaction between China's transportation network and regional economic growth; they conclude that clear consensus exists regarding this interaction.

This paper marks progress in evaluating the interrelationships between different modes of infrastructure and regional economic growth in China. Our panel dataset

from 2005-2014 consists of the 31 province-level divisions in China, and includes provincial data on air, conventional rail, HSR, roads, waterways, and economic output. We accommodate for transportation's potentially sizeable feedback effects and endogeneity with dynamic GMM and VAR methods. Our paper is the first in China to estimate multiple transportations modes and their impact on primary (agriculture), secondary (manufacturing) and tertiary (service) GDP; Lastly, we examine the cost of infrastructure spending compared to the benefits of higher economic growth.

A preview of our results demonstrates that increases in rail and road turnover volume have a significant impact on economic growth in China. GMM parameter estimates indicate that a 1% increase in rail and road turnover volume (or usage) leads to respective boosts of .11% and .07% in regional output growth. Rail and road's positive effects are significant and economically large for agriculture and manufacturing output growth, and significant with smaller coefficient estimates for service output. Rail has a strong impact on all three regions of China, while roads are also significant. Changes in air, HSR and water infrastructure have little effect on GDP growth and their impacts are not robust across specifications.

Lastly, a cost-benefit analysis determines that the economic benefit of roads, and particularly rail, outweigh their costs. In contrast, the growing costs of HSR with little economic benefit may lead to debt challenges for China's Rail Corporation that has to pay the interest payments on the infrastructure construction.

Background

Transportation's affirmative effect on infrastructure was laid out by prominent work by Aschauer (1989) and Munnell (1990). Research by Chatman and Noland (2011) shows that reducing transport costs and increasing accessibility leads to positive agglomeration effects. HSR's impact on the Chinese economy has recently emerged as a hot topic for both academic and policy-related reasons. The rapid implementation of HSR was part of a hefty four trillion yuan infrastructure investment plan to mitigate the effects of the global financial crisis. Its goal was to boost accessibility as well as modernize the network capacity for passengers and freight, rebalance network inequalities and foster rail innovation (Chen & Vickerman, 2016). Li et. al (2018) show that China's HSR leads to economic growth. However, Wu et al. (2014) shows that HSR may not be worth the cost relative to conventional rail.

The argument for government subsidies for HSR relies on the simple intuition that fast rail can better connect consumers, businesses and ideas together. Before intercity competition can generate economic activity, there must be reliable physical market access; e.g., a generation ago, China consisted of dozens of isolated pockets of large cities with many millions of consumers, but with few quick transport connections between cities. Transportation infrastructure such as HSR increases

the access of medium cities, large cities and megacities to each other, and due to agglomeration effects of cities, may lead capital and skilled labor to move to regions that are more productive.

Model and Estimation Methods

Transportation infrastructure is an important factor affecting economic growth. According to an extended Cobb-Douglas production function (Su & Zhao, 2011), traffic infrastructure can be introduced as a factor that affects technological progress. As a result, we estimate:

$$GDP_{it} = c_{it} + \gamma_1 Rail_{it} + \gamma_2 Road_{it} + \gamma_3 Water_{it} + \gamma_4 HSR_{it} + \beta_1 K_{it} + \beta_2 HC_{it} + \varepsilon_{it}$$

To induce stationarity and avoid spurious inferences, we difference the data, and hence examine changes in real output for each province. To study the effects of transport infrastructure on economic growth, we use converted turnover volume to measure the level of transport infrastructure of conventional railways, highways, waterways and HSR in different regions. For air, we combine the log of air freight tons and the log of passenger volume; alternative specification of this variable had little effect on inference. The data of GDP, passenger volume, freight volume, and passenger turnover of all modes of transportation except HSR are all from China Statistical Yearbook. Rail data are from the website of the State Railway Administration. The data consist of all 31 Chinese province-level divisions from 2005-2014.

Results

Table 1 presents aggregate fixed investment expenditures since 2003. Column one shows that total fixed transportation investment rose sharply from 548 billion yuan in 2003 to 52939 billion yuan in 2017, reflecting annual increases of nearly 19%. Roads receive more than half the total infrastructure investment budget. Rail is the next most important transportation investment budgetary item and receives roughly 25% of the budget; HSR receives 42-77% of the annual total rail budget and less than 10% of the overall transportation budget. Air and water infrastructure each receive about 3-4% of the transportation budget. For comparison, the last two columns present fixed investment for education and health care. Most of the spending in these categories for education and health are likely operating expenses including wages, and not in new buildings or facilities (investment), which is the spending we report here. Nonetheless, the building of roads in China exceeds the building of schools and other educational facilities by a factor of nearly four and exceeds construction of hospitals and other healthcare facilities by a factor of over seven times.

Table 1. Annual fixed investment in infrastructure

	Total Trans	Roads	Total Rail	HSR	Conv. Rail	Water	Air	Educ	Health
2003	548	361	71			36	22	147	33
2004	682	467	85			54	27	180	42
2005	854	558	127			78	30	197	55
2006	1078	648	197			100	46	213	65
2007	1228	693	249	60	189	111	61	222	73
2008	1469	741	407	224	193	120	59	236	94
2009	2160	1056	666	425	241	167	61	324	145
2010	2462	1228	744	569	176	194	83	372	155
2011	2713	1608	592	428	164	193	84	389	191
2012	2990	1747	613	421	192	201	112	461	220
2013	3451	2050	669	309	360	212	131	540	259
2014	4046	2451	768	355	413	244	143	671	320
2015	4473	2861	773	357	416	235	184	772	394
2016	4937	3294	775	328	446	216	222	932	460
2017	5701	4030	801	339	461	189	240	1108	524
Annual	18.6%	19.2%	21.5%	35.4%	12.8%	13.9%	19.6%	15.8%	22.2%

(billion RMB)

Data are from the Chinese Statistics yearbook. Total Trans (transportation) includes road, rail, water, air, pipeline and urban transport; urban public is missing for several years but extrapolated. The last row is the average annual growth rate. HSR and conventional (Conv.) rail budget division in 2007 and 2008 are estimated. Educ (Education) and Health investment are also presented for comparison.

Table 2 presents summary statistics for the data. The first row reports average annual growth rates; real GDP grew by 7.4%, while road and conventional rail grew by 19.5% and 6.9% respectively. HSR volumes increases averaged 50% as it was nonexistent until 2008. Human capital grew the slowest, as Chinese modest population growth implies years of education can only rise slowly over-time. Autocorrelations in the second row show most exhibit modest autocorrelation.

Table 2. Summary Statistics

	GDP	K	HC	Road	Rail	HSR	Water	Air
Mean	0.074	0.154	0.016	0.195	0.069	0.519	0.053	0.136
Autocorr	0.274	0.862	-0.271	-0.062	0.361	-0.089	0.051	-0.382

Table 2 presents the mean growth rates for all variables in the first row, and autocorrelations (Autocorr) in the second row. RGDP is real GDP growth, K and HC are the growth rates for physical and human capital respectively. Road, Rail, HSR, Water and air are the growth of turnover for roads, conventional rail, HSR, water and air, respectively.

Table 3 presents GMM estimation results that handles endogeneity (see Arellano and Bover (1995); we report robust standard errors in parentheses. Column I present GMM estimates using lagged orthogonal Deviations (Arellano & Bover, 1995) that remove individual effects; the procedure applies the AB-n step, which uses residuals from the first step. Results show that human and physical capital are strong determinants of GDP. Rail, roads and water and also significantly related to GDP. A 1% increase in rail (road) growth is associated with a .11% (.07%) increase in regional economic output.

Table 3. GMM estimates of GDP 2005-2014

	I	II	III	IV	V	VI	VII	VIII	IX
	GDP	GDP	GDP	Com	Fixed	GMML2	2005-12	2007-14	OLSF
HC	22.64*** (4.57)	24.67*** (5.79)	24.84*** (4.04)	16.30** (7.70)	39.50*** (11.62)	20.78*** (6.64)	19.57** (8.58)	25.35*** (9.07)	24.605*** (5.52)
K	57.19*** (7.92)	43.25*** (12.80)	54.79*** (6.29)	28.17*** (10.87)	19.02 (13.39)	56.11** (21.33)	21.88*** (6.00)	44.51*** (7.67)	45.00*** (6.69)
Rail	10.71*** (1.63)	9.16*** (1.31)	17.91*** (3.63)	24.02*** (8.37)	65.82*** (12.24)	14.13*** (3.23)	7.77*** (2.21)	8.15*** (2.11)	15.49*** (4.32)
HSR	-0.30 (0.27)	-0.45 (0.28)	-0.04 (0.27)	1.03 (0.64)	0.57 (0.38)	-0.08 (0.30)	-0.31 (0.35)	-0.91 (0.49)	-0.15 (0.23)
Road	7.22*** (0.41)	6.23*** (0.34)	6.43*** (0.62)	22.46*** (4.59)	7.41*** (1.84)	6.38*** (0.53)	4.60*** (0.42)	6.36*** (0.63)	5.59*** (0.89)
Water	1.32*** (0.42)	1.29 (1.24)	-0.32 (0.24)	3.38 (4.71)	-3.64 (6.32)	2.30** (0.98)	1.10** (0.44)	1.30*** (0.47)	-0.46 (0.96)
Air	1.61 (1.35)	1.41 (1.59)	2.42*** (0.55)	-1.68 (4.62)	2.04 (1.99)	1.91 (1.46)	1.55 (0.95)	1.60 (1.33)	1.67 (1.51)
Labor			-7.40 (-6.55)						
SE	0.06	0.06	0.06	0.07	0.06	0.09	0.04	0.05	0.04
J statistic	30.32	15.94	29.47	13.22	24.62	29.72	31.0	27.07	.323
J Prob.	0.17	0.90	0.17	0.10	0.48	0.19	0.18	.30	

Column I estimates GDP growth using Arellano and Bond's (AB) n-step orthogonal GMM specification with dynamic lags. II presents estimates with traditional differences and AB-1 step. Columns III adds labor to the AB-n step orthogonal procedure. IV and V uses GMM with common and fixed effects. VI uses the AB-n step differenced procedure with 2 lags. VII (VIII) uses AB-n step with orthogonal differences for the sample period 2005-2012 (2007-2014). IX presents OLS estimates with fixed effects, and the number for the J statistic is the adjusted R² statistic. All variables are in growth rates. All equations report robust standard errors in parentheses. Coefficient estimates and standard errors are multiplied by 100 for presentation, and hence a 1% increase in human capital for instance leads to a .22% increase in real GDP. ***, ** and * are 1%, 5% and 10% significance.

The remaining columns assess the robustness of alternative specifications. Results that difference the data to remove individual effects (e. g., traditional, non-orthogonalized differences) and apply an AB one-step procedure (instead of AB-n). Column III uses the same specification as I but adds labor; the variable is insignificant and dropped from additional specifications. Column IV (V) present GMM estimates using a common (fixed) intercept. Rail and road estimates are significant and large; water coefficients are not robust to these specifications. Column VI uses an additional lag of all variables, and results are similar to I.

VII (VIII) estimates the GMM specification in column I but over the time period 2005-2012 (2007-2014). Although approximately half the data are different between these two time-periods, inspection between these columns reveals relatively similar rail and road estimates. The robustness of the coefficient estimates suggests relatively stable parameter estimates over-time; further, note, the rail and road estimates are slightly larger for the later time-period, this suggests these variables have not hit diminishing returns. Since transportation spending and turnover have increased over-time, diminishing returns implies the parameter estimates would decline over time. Lastly, an OLS specification with fixed effects in IX shows relatively similar and significant estimates for HC, K, rail and roads, although these parameter estimates are likely biased.

Overall, railroad and road are significant in all specifications and average across the eight GMM specifications 19.19 and 8.38, respectively. Water (air) average .84 (1.3) and are significant in only three (one) GMM specifications. HSR is not significant in any GMM specification. The control variables, human and physical capital, are significant in nearly all GMM specifications.

An alternative method to accommodate for endogeneity is vector autoregressions and impulse response functions. A vector autoregression uses only lags and is often used in policy analysis by central banks to study multiple variables with endogenous interactions. For instance, prominent work by Bernanke et al. (2005) construct a VAR to trace out the effects of monetary innovations on the economy. Impulse response functions evaluate the impact of a shock in one variable on another. In our case, we plot the relationship between changes in transportation variables and

real GDP. To highlight and isolate the importance of transportation and reduce the dimensionality of the matrix, we do not include human and physical capital. We plot generalized impulse response functions as the method’s output is invariant to ordering.

Figure I highlights a significant positive response of GDP growth to innovations in past rail and road turnover-volume growth. In contrast, innovations to water, air and HSR have no impact on real GDP growth. Figure II highlights the importance of endogeneity and bi-causality, a topic we revisit in the next section. Increases in GDP lead to higher turnover volume of rail and roads.

Table 4 presents Granger Causality statistics. The c_2 statistic and probability are presented. Panel A represents the specification that growth in transportation turnover do not Granger Cause GDP growth; rejection (high c_2 statistics and low probability) implies that transportation ‘Granger Causes’ or contributes/examines future GDP growth. Panel B represents the specification that GDP does not Granger Causes growth in transportation; rejection implies that GDP growth leads to more transportation turnover in the future. Results clearly document bi-causality between transportation and GDP; thus, confirming the importance of modeling the endogeneity through GMM and VAR methods.

Table 4. Granger Causality
Growth in Transportation does not Granger cause GDP growth

Panel A	HSR	AIR	WATER	ROAD	RAIL	HC	K
GDP	10.90	6.18	13.71	64.37	9.99	24.44	32.51
	0.03	0.19	0.01	0.00	0.04	0.00	0.00
GDP1	13.64	4.16	21.90	17.61	2.01	4.11	14.91
	0.01	0.39	0.00	0.00	0.73	0.39	0.00
GDP2	9.69	6.65	11.62	53.57	8.44	17.80	23.61
	0.05	0.16	0.02	0.00	0.08	0.00	0.00
GDP3	1.25	2.88	8.80	20.90	1.71	36.47	26.10
	0.87	0.58	0.32	0.02	0.79	0.00	0.01

Panel B	<i>Growth in GDP does not Granger Cause Transportation</i>						
GDP	2.93	1.21	0.81	10.75	14.77	26.38	12.17
	0.57	0.88	0.94	0.03	0.01	0.00	0.02
GDP1	8.10	4.40	0.75	4.02	5.82	17.62	4.95
	0.09	0.35	0.95	0.40	0.21	0.00	0.29
GDP2	4.07	2.18	2.19	13.57	14.66	19.13	11.26
	0.40	0.70	0.70	0.01	0.01	0.00	0.02
GDP3	6.44	1.99	12.12	4.14	7.75	2.93	3.78
	0.17	0.74	0.02	0.39	0.10	0.57	0.44

Table 4 presents Granger Causality statistics. Panel A represents the specification that growth in transportation does not Granger Cause growth in GDP. Panel B represents the specification that GDP growth does not Granger Causes the inputs. c^2 statistics and their probability are presented. Rejection in Panel A implies that transportation Granger Causes GDP growth. Rejection in Panel B implies that GDP Granger Causes transportation growth.

Policy Implications

Comparing the costs versus the benefits of transportation's effects on the Chinese economy is difficult, but imperative. The Chinese government does not report transportation budgetary items or expenditures by province (or city), which is the focus of the paper; instead, they report only aggregate annual infrastructure spending. The GMM estimates in column I of Table 4 show rail coefficient is 10.7 and road is 7.2. Since the estimates are multiplied by 100 for presentation, a 1% increase in rail (roads) leads to .107 (.072) increases in GDP growth.

Consider the road budget, Table I shows an average growth of 19.5%; table II shows the average growth in turnover is 19.2% and hence approximately the same. Thus, if the authorities increase the rail budget 20% annually (close to the historical average), it will cost 806 billion RMB ($4030 \times .2$), this will generate an increase of GDP of $.20 \times .072 \times 82428$ (GDP in billions for 2017) = 1187 billion RMB. The benefit of 1191 billion RMB is 1.67 times greater than the cost of 806 billion RMB. To estimate rail's impact, we multiply the GMM estimate of .107 times the ratio of increase in transportation in our sample of .069 divided by annual spending increases of .128 (which equals 0.53). Then consider if the authorities increase the budget by the historical annual average of 12.8%, it will cost 59 ($.128 \times 461$) billion RMB. This compares to $.128 \times .107 \times .53 \times 82428$ RMB, which equals 598 billion RMB. This is ten times the expenditures. Thus, in term of 'bang for buck', rail outperforms other methods of transport. Note, we do not consider the cost versus the benefits for air, water and HSR, since the GMM estimates in Table 4 are typically insignificant.

Conclusion

We examine the relationship between growth in transportation and economic output across China's 31 provinces from 2005-2014. GMM estimates demonstrate relatively large and significant effects of road and rail on provincial output growth. Rail's impact particularly is robust across time and econometric specifications and has a large effect on agriculture and manufacturing. GMM methods document little sizeable effects of air, HSR and water on output. HSR's impact is insignificant in the eastern region, and its effect considerably less than conventional rail. Impulse

response functions document the importance of both rail and roads to future output, and the lack of sizeable effects for air, HSR and water infrastructure growth.

The government's ongoing efforts hence to promote both HSR and air by large infrastructure spending thus maybe misplaced. Results also demonstrate that infrastructure's impact on service growth is lower than manufacturing, and the impact of human capital is more important. Budget spending for fixed investment however for building roads outweighs building schools by more than three to one. Thus, as China begins its transition from a manufacturing economy to more service-oriented economy, its priorities toward fixed investment should also experience transition.

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Figure I: Impulse Response Graphs of Real GDP growth to Transportation

Accumulated Response to Generalized One S.D. Innovations ± 2 S.E.

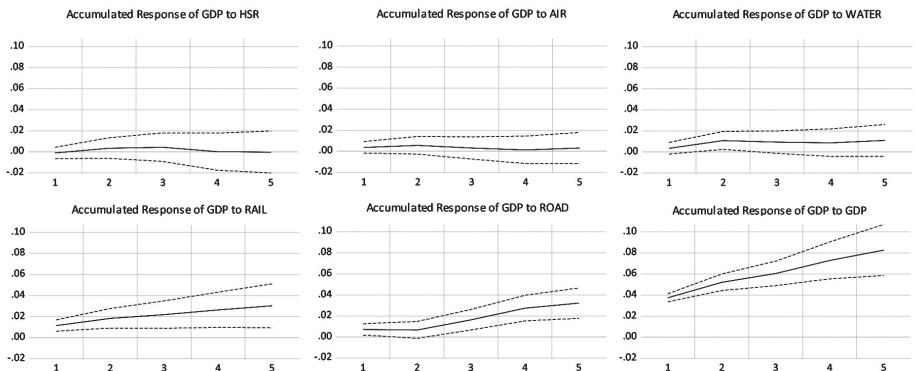
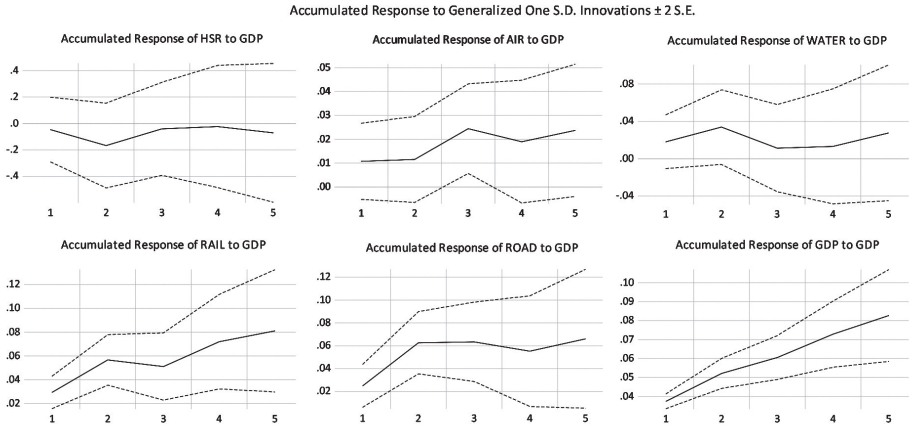


Figure II: Impulse Response Graphs of Transportation to Real GDP



Bio-note

Dr Jack Strauss has extensive forecasting experience including over four dozen publications using advanced statistical methods in the top journals in Finance, Econometrics and Economics. These include the Journal of Finance, Review of Financial Studies, Review of Finance, Journal of Portfolio Management, Journal of Applied Econometrics, Journal of Forecasting, International Journal of Forecasting, Econometric Reviews, Review of International Economics, Journal of International Money and Finance, Journal of Urban Economics, Journal of Macroeconomics and Economic Letters. He has consulted for the Central Bank of Azerbaijan, Egypt, Indonesia and Ukraine.

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Democracy: From Theory to Dictatorial Dyspraxia to Anarchist Eupraxia

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Abstract

In theory: Democracy is the “rule of the people by the people and for the people” (Lincoln, 1863). In practice: “Democracy substitutes election by the incompetent many for appointment by the corrupt few” (Shaw, 1903). This paper addresses the gap between democratic theory and practice by attempting to analyse “democracy’s crisis of meaning” (Trend, 1996:7). It examines the processes through which the theoretical ideal of rule by the people is despoiled to dictatorial practices, typified by regimes of democratic dictatorship arising from the authoritarian rule of representative forms of democracy resulting in the tyranny of the powerful, to regimes of dictatorial democracy arising from the totalitarian rule of global neo-liberal capitalism. These contradictions indeed suggest “more than a simple gap between theory and practice” (Trend, 1996:9) and demand a new praxis for democracy. Despite the hegemonic dyspraxia of these kleptocratic and corporatocratic regimes on both a local and global level, the eupraxia of anarchism through co-operative forms of self-governance offers a glimpse of hope for democratising democracy by closing the gap between theory and practice.

Keywords: *democracy, dictatorship, kleptocracy, corporatocracy, anarchism*

The Theory: Democracy

Democracy, deriving from the Greek words ‘demos’ = ‘people’ and ‘krates’ = ‘rule’ means “rule by the people.” Thus, democracy entails a form of governance in which the supreme power is vested in the people unlike in authoritarian and totalitarian regimes.

Although democracy is defined and practiced in many ways, a common feature concerns the participation of the people in the decision-making process, such that power is exercised either directly by the people or through their elected representatives. In the latter case, periodic, free, fair, competitive and inclusive elections assure the consent of the electorate and translate that consent into governmental authority. Elected officials make political decisions, formulate laws, administer services and run the country on behalf and in the interest of the people.

Whatever the mode of governance adopted, “democracy is government of the people, by the people, and for the people” (Lincoln, 1863).

Democracy is more than just a form of governance. It is a way of life which rests upon the application of ideals and practices committed to the values of respect, cooperation, and compromise. It is based on the appreciation of diversity as “intolerance” hinders “the growth of a true democratic spirit” (Gandhi, 1938) and fundamental rights and freedoms. Civil, political, social, economic and cultural rights “enable individuals to grow and pursue their personal dreams and goals” and participate fully in the political, economic and cultural life of society (Heichel, 2014:para 7). Democracy rests upon the principle of majority rule, minority rights in the acknowledgement that the rights of minorities should not depend upon the good will of the majority. Citizens in a democracy thus do not only possess rights and freedoms, but also hold the responsibility to protect the rights and freedoms of others. Democracy is thus the institutionalisation of freedom.

Dictatorial regimes tend to be characterised by the concentration or total exercise of political power by the state which regulates every aspect of public and private life. Democracies in contrast guard against all-powerful central governments through decentralisation of power. Indeed, an important feature of a democracy is pluralism, where the state is only one actor amongst several varied stakeholders. Pluralism implies that such entities should not depend upon government for their existence and legitimacy, unlike in authoritarian or totalitarian regimes where they would be strictly controlled and monitored.

In a dictatorial regime, the law is simply the will of the ruler. Democracies, in contrast, are based on the principle of the rule of law. Democratic governments exercise authority by way of the law and are themselves subject to the law. Constitutionalism defines limits on the power of government to provide for checks and balances and prevent potential abuse and tyranny. Power is divided through legislative authorities which enact the law, executive authorities which implement it and the judiciary which addresses violations. In a strong democracy, all levels of government must be accessible and responsive to the people.

Citizenship participation is vital “for democracy to be viable and meaningful” (Dalton,1988:35). While, voting is “the first and smallest step” (Gaines, 2005:10), citizens need to be key actors and stakeholders in the policy making process across all levels and spheres of governance since “a democratic system which is void of the active support and involvement of its citizens may face serious problems of legitimacy and ultimately of its own survival” (Lipset, 1963:180).

Dyspraxia: Dictatorship

“That is the theory. But the practice does not meet the theory” (Harman, 2005:para.4). Indeed, the discrepancy between the theoretical ideals of democracy

and the dictatorial practices evident in contemporary societies suggest “more than a simple gap between theory and practice” (Trend, 1996:9) as evinced from the praxis of democratic dictatorship and dictatorial democracy.

Democratic Dictatorship

A democratic dictatorship is a “dictatorship which paints itself as a full-fledged democracy”. It “pretends to be a democracy to its people and to the world” (White, 2016: paras 1-3). Kleptocracy, deriving from the Greek words ‘kleptes’ = ‘thief’ and ‘kratos’ = ‘rule’ refers to administrations which further their own and other elites’ political and economic power through corrupt practices (Lowman, 2016). Dictatorships and kleptocracies are synonymous since dictators “steal from the many and give to a small elite group in exchange for power” (Fuller, 2017: para 4-5) instead of acting for the common good - a sentiment shared by many citizens in ‘democratic democracies’.

In theory, most democracies including Malta, are constitutional democracies; in practice, they form a kleptocratic dictatorship. Corruption and bad governance, nepotism, favouritism and lack of transparency prevail and are ingrained in their political system and culture. Indeed “the perpetual violation of laws, cronyism, nepotism, abuse of public money, and promotion of corrupt practices by our rulers defy all norms of constitutional democracy [and] these undesirable practices are not confined to any particular political party in power” (Huzaima and Haq, 2017:para2). Money power controls electoral campaigns. The party with the largest capital and savvy marketing campaign gets elected and repays its backers through in-kind benefits – tenders, special concessions, licensing and permits. Revolving doors define the appointment of sponsors and lobbyists to key decision-making roles and high-ranking public officials to high-paying jobs within the private industry. Such connections ensure the sustainment of corporate interests in administrative decisions and blur further the distinction between government and the private sector.

Though Malta and other supposedly ‘democratic democracies’ do not contend with Mao Zedong’s China Democratic Dictatorship or the Democratic People’s Republic of Korea, the democratic process leaves much to be desired. Highly relevant issues of national concern are often partaken without any form of parliamentary discussion, let alone public consultation and participation.

The extent of Malta’s kleptocracy emerges through its economic agenda. A privatisation dogma prevails, manifested through the sale, leasing and contracting out of public assets and services – from basic utilities, telecommunications, financial services and industries (ex: Enemalta, Maltacom, MaltaPost, Mid-Med Bank, Malta Drydocks, Malta Freeport, Air Malta etc) to healthcare provision and graveyards - and the transfer of public land under shady and illegitimate deals - Smart City, Manoel Island, Tigne Point, Portomaso, Fort Chambray, American embassy, Valletta

Waterfront, the American University of Malta, the ITS site, and Marsa race track, to name but a few. This privatisation and divestment process, along with increasing deregulation shows no signs of abatement, resulting in extending private control over civic matters and the appropriation of public assets by the private sector in betrayal of the public interest. This is accompanied by tax and other financial incentives which persistently profit the rich and powerful; at a time when Government debt stands at 46% of the country's GDP (NSO, 2019). Thus, as the rich are becoming richer, the nation state and its people are increasingly becoming indebted and divested of their assets.

What is given to the people is in the form of tokenism – needless to say the meagre increases throughout the years in the minimum wage, social security and retirement pensions, and social protection investment for increasing the adequacy and affordability of housing and utility costs for low income earners; a triviality compared to the increase in the cost of living. Tokenism permeates consultative and participative practices. In theory, such fora offer a valid vehicle for putting forward citizens' views. In practice, they offer a very limited, mild and regulated form of consultation and participation, often through an elitist structured approach which has already gone through various levels of filtered governance justifying an already set agenda based on the quantification of votes and the appeasement of the powerful elite.

The bureaucratisation of civil society demeans its autonomy. The more 'power' and 'recognition' bestowed through 'consultation', co-financing and public-private partnerships, the more civil society is closely monitored and regulated by the state and the more placatory it becomes to the authorities. Such alliances, mellowing down the governmental/non-governmental distinction thus act as a tacit tool to register consent and legitimise praxis, giving an illusory and superficial sense of representation and participation.

Kleptocracy entails a wide ranging long term impact on democracy. Though at "first: life goes on" in spite of rampant administrative corruption and conflicts of interest, "over time, however...there will be "trickle-down corruption", encouraging unethical behavior and venality, such as bribery and tax evasion among the general population through an 'if you can't beat them, join them' effect (Palifka, 2017:para 4).

Representative democracy thus constitutes an oxymoron. It controverts the 'true' meaning of democracy – rule by the people. It corrupts this fundamental principle by taking the power from the people and giving it to the rulers – in the process disempowering the people and empowering political-administrators and the powerful elite. Representative democracy undermines the majority rule/minority rights principle, the rule of law and ideals of pluralism and equitable and inclusive representation. Representation becomes tokenism, human rights a privilege, and freedom, the choice between a corrupt kleptocratic party over another kleptocratic party – constantly a choice of the lesser evil.

Dictatorial Democracy

Globalisation has transformed the world into a global village through the shrinkage of geographical distance and increased economic, political, social and cultural interdependence. As a result, we are increasingly thinking in terms of both problems and solutions, in global terms (Robertson, 1992). Globalisation offers many opportunities. However, these opportunities and benefits are not equally shared driving prosperity in the minority part and poverty in the majority part of the world.

70% of all international trade (worth \$10 million a minute) is controlled by multinationals, the assets of which are larger than most nations (Sklair, 2002). Out of the 100 largest economies, 51 are corporations while 49 are countries. The assets of the top 200 corporations equate to the combined economies of 182 nations and double that of 80% of all humanity (Global Policy Forum, 2000).

Global financial transactions facilitate embezzlement and money laundering. Around 5% of the world's GDP is laundered money while illicit cross-border financial flow amounts up to \$1.6 trillion annually (Duffy and Sibley, 2017). Transnational corporations deposit their assets in low or no tax jurisdictions and their losses in high-tax ones, evading law and contributions (Vanbergen, 2016). Kleptocracy and corporatocracy are inextricable since while "kleptocracy...is the dark side of globalisation. Offshore finance is what made it possible" (Bullough, 2018: para 3).

Through "a relentless process of influence-peddling" (West, 2017: para 28), corporate lobbyists pose a huge influence on the international agenda. This is evident through global trade 'agreements' such as the Trans Pacific Partnership and Transatlantic Trade and Investment Partnership, through which corporations are enabled to bypass and trespass national legislation. Nation states are increasingly subjected to corporate domination, in the process losing out on self-governance as sovereignty is enslaved by corporate interests. A new form of neo-colonialism has emerged as poor nation states become dependent and controlled through oppressive and exploitative practices by TNCs, while profits reaped are generated back into the economy of rich countries. The United Nations, supposedly a key advocate and guardian of democracy and sustainable development has become corrupted by this corporate agenda, as evidenced from the 'Global Compact' initiative.

Corporate governance self-perpetuates conglomerate power - through mergers, 147 companies control 40% of all global trade (Vitali, Glattfelder and Battiston, 2011) - in the process hindering competition and pushing smaller businesses and people to the margins. Indeed, "rising inequality has accompanied the march towards corporatoracy" (West, 2017: para 28).

An imperialist world order has emerged, dominated by multinational corporations and promoted by supranational institutions such as the International Monetary Fund, the World Bank and the World Trade Organisation. Decisions are not partaken by sovereign nation states elected 'democratically' by the people but by corporations which are accountable to no one. The sovereign nation state, the progeny of

democracy, is becoming obsolete as corporate interests undermine self-governance and the rule of law. Capitalism is the echelon of well-being, the warranty of rights and freedoms. Profit is the 'new' politics, global capitalism, the 'new' democracy.

Malta is no exception. It forms another player in this web of neoliberal free market global economy, interchangeably ruled by supranational bodies and fed through transnational corporations. Multinationals are the order of the day as local small businesses are increasingly being engulfed and pushed out by big companies. Ethical business is a thing of the past as Malta embarks and profits from the proceeds of the gaming industry, financial services companies, exploitative and precarious work by asylum seekers and immigrants, and gentlemen's clubs and massage parlours. Human trafficking abounds while citizenship is a commodity 'by investment' in spite of "security, money-laundering and corruption risk" (Borg, 2019).

Legislators seem unable or rather unwilling to address this state of affairs as Malta's economy, social, and moral fabric is shaped and partaken by such global forces. Economic growth overrules social and environmental wellbeing in the face of a skyrocketing estate market and environmental degradation by the construction industry. GDP does not ripple down as it accrues in the hands of the minority while the populace finds it increasingly harder to cope with everyday life expenses, albeit the country's transmutation into a concrete jungle of luxurious apartments and commercial complexes.

Democratic capitalism constitutes an oxymoron. Global capitalism corrupts the democratic system by glorifying competition and profit; it overrides the sovereign national state, the rule of law and through monopolisation and concentration of power, equality and pluralism. Fundamental socio-economic and cultural rights - education, healthcare, social security - become a privilege, increasingly dependent on private insurance and bank credit.

Current discourses of democracy shrouded in ideals of individual freedoms, pluralism, development, meritocracy and competition promote this neo-liberal supremacy, by which Western countries "own the term and use it to police or discipline" those not meeting these criteria (Dhaliwal, 1996:50). The forces of consumption (Baudrillard, 1972) generate obedience and consent through false needs (Marcuse, 1964) as we are brainwashed by the commodification of capitalist society, while democracy becomes the "freedom to choose between Coca-Cola and Pepsi, Levis and Nike, BBC or CNN, McDonald's and Pizza Hut" (Aissaoui, 1999:19). The right to vote becomes the right to buy, as citizens become customers and consumers.

Despite the hegemonic success of this corporatocratic regime, we all have a feeling that something is not quite right...we know a slow motion coup d'état is taking place by transnational organisations facilitated by our political leaders. The incontrovertible proof stares at us in the face every day with wave after wave of financial, economic, social and ecological crisis.

(Vanbergen, 2016:para 2)

Indeed, as democracy transmutes “from farce to tragedy” (Vanbergen, 2016:para 32) through the totalitarianism rule of the global capitalism, it has become another ‘fetishised’ commodity (Baudrillard, 1998), sold and bought as democracy, consumed as dictatorship.

Eupraxia: Anarchism

“Is democracy dying, or perhaps already dead? Is it really time to eulogise democracy, or are we rather on the cusp of a new phase in its long and varied life?” (Gagnon, 2018: para. 5) What, if any, should be the antidote to address the existing discrepancy between democratic theory and dictatorial practice?

‘True’ democracy entails rule by the people. Yet, this “literal Greek meaning...is hopelessly nostalgic, dangerously utopian, anti-modern, [and] anti-liberal” (Euben, 1996:63) such that, it is not ideal to go “back to a pre-modern concept of the political” (Mouffe, 1992:5).

In a ‘true’ democracy, the political system should respond and be held accountable to the people. The ‘antidote’ to democracy’s crisis of meaning is indeed that of giving “citizenry as a whole a clearer voice in the public policy process” (Program for Public Consultation, 2016:para 7).

In a participatory democracy, decision-making is decentralised, non-hierarchical and consensus oriented. It entails a process of collective decision-making where citizens decide on policy proposals and politicians assume the role of policy implementation, thus overcoming the shortcomings of representative democracy by combining it with elements of direct democracy. Practices range from consultations which aim to “inform decision-makers of citizens’ views”, co-governance which gives “citizens significant influence over...decision-making” and self-governance which provides the people “agenda-setting and final decision-making power”. The further one moves towards self-governance, the “potential impact of citizens on decision making increases” (Smith, 2006:7).

Participatory practices can be a very powerful and effective tool to decentralise power, empower communities and support ownership and control (Flacks, 1996). Greater transparency in administrative processes, the introduction of more stringent regulations which limit party financing and revolving door influences and the introduction of recall elections to enable “the people to discharge their public servants when the public servants cease to be satisfactory to them” (Wilcox, 1912:169), enhance accountability and restrict state power and abuse.

Malta’s bi-partisan political culture defined by patronage, nepotism and a winner takes-all style of governance dejects good governance. In the recognition of the futility of “dividing small communities by party politics” (Kersell, 1992:298) through a “zero-sum game” (Guinier, 1994:153), the adoption of a “winner-take-some-but-not-all approach” should help in “reconnecting people to their democracy” (Huhne,

2009:327). These reforms substantiate the view that;

Our country needs to respond rapidly to this potential weakening of our democracy. Citizens must be placed in a direct position to influence political decision, which concern them...There must be more accountability in parliament...The powers of scrutiny need to be enhanced. Too much power goes unchecked. The electoral system needs an overhaul so that votes are not wasted. Shifts of power away from the central to the local government level need to be further encouraged. Government should introduce powers for citizens to propose legislation and to launch public inquiries. Donations to parties need to be capped and made transparent.

(MaltaToday, 2006: para 8)

Yet, while reform may temporarily ameliorate the social order, such tokenistic, institutionalised concessions may in effect extend the power of the dictatorship. History demonstrates that dictatorial regimes can only be overthrown by “ceaseless struggles and popular resistances” (Szolucha, 2018: para 2). As democracy is ousted by dictatorial practices, more direct and radical modes of civic expression - albeit in subversive form - offer a more straightforward, visible, inventive and effective way of voicing demands and expressing dissent. Indeed, in the face of gross disregard and misrepresentation, radical action is often the only viable mechanism left for the people to make their voices heard.

In view of the “shared sense that the state will not do and is not doing what needs to be done”, its smallness to “deal with international capitalism” and largeness “for radical democracy”, democratisation entails going beyond the state (Euben, 1996:73). “Re-envisioning of the meaning of and relevance of democratisation -must begin with the fact of globalisation” (Flacks, 1996:112) through a rethinking of the way the “market operates in politics” (Huhne, 2009:38). It demands “efforts by people to protect ways of life, living standards, and other interests from the... ravages of global market forces” (Flacks, 1996:113). Indeed, “for those who refuse to accept liberal democratic capitalism as the end of history”, radical democracy presents the only viable alternative (Mouffe, 1996:19).

Democracy is “aggressively anti-organisational, suspicious of institutional forms and persistently self-transformative” (Euben, 1996:66). It advocates “grassroots politics, diversity, a playful political practice that is not bound by rigid structures but is continually in the process of transformation” (Epstein, 1996:128). It validates the “pluralism” (Mouffe, 1992) and the “multi-level nature of modern governance” (Hay et al., 2008:5) that exist within a “complex moral universe” (Stoker, 2011:141-142). Democracy entails the creation of “new and different political spaces” (Laclau and Mouffe, 2001: 181) and a “recommitment to open and transparent politics” (Flinders and Buller, 2005:28). By presenting a platform through “which ordinary people directly and consciously participate in the exercise of voice”, civil society

locates power “where people’s lives are centered” and demand “control of their history” (Flacks, 1996:104-113). It also “disturb[s] when necessary” (Azzopardi, 2007) since a “culture of passivity and apathy, an obedient and docile citizenry, are not consistent with democracy” (EIU, 2011:30). Indeed, since the “democratic impulse rarely originates in the corridors of power” (Szolucha, 2018: para 1), true democracy demands resistance to and overthrow of existing power relations for establishing a more co-operative voluntary form of self-governance. In essence, “Anarchism is democracy taken seriously” (Abbey, 1988:26).

Theory and Praxis

Liberal representative democracy is a myth: a theoretical fable, a practical failure. The world is ruled by a corporate kleptocracy governed by huge transnational corporations and supported by corrupt administrators. Malta is no exception and acts as a miniature manifestation of this global state of affairs. As in other corporate kleptocracies, periodic ‘free’ and ‘fair’ elections are held to elect representatives to act on behalf of the people while various institutionalised forms of participation give the illusion of representation: “Let the people think they govern and they will be governed” (Penn, 1682:337).

In theory, “democracy thrives on freedom, [while] a dictatorship thrives on oppression” (Heichel, 2014: para 10). In practice, democratic and dictatorial regimes are not mutually exclusive - they converge and coexist under a wide spectrum of ideologies and practices. This fine line is masked by the totalitarian regime of neo liberal capitalism through which the spectra of democratic dictatorships are engulfed within a global dictatorial democracy.

The tyranny of the political elite and the tyranny of capitalism define national and global agendas through the agglomeration of political and economic power. The rich and mighty undermine democracy through money power and ideological discourse, hegemonising democratic dictatorship and dictatorial democracy as the sole and ultimate form of governance – a corporate kleptocracy.

This is the unfortunate reality of democracy in present day societies. Yet, while this “pervasiveness...is emptying the term of its significance...democratic ideals as participatory government and egalitarian politics retain merit” (Trend, 1996: 17). Indeed, this “should not transform us into sceptics about democracy” since history shows that “there is something about democracy worth mobilising for” (El-Wakil, 2018: para 3-4).

Truly, the history of democracy recounts a counter narrative - the ongoing and relentless struggle of people everywhere, mostly the oppressed and exploited, to establish and reassert a more literal meaning of democracy – direct rule by the people through “an endlessly unfolding process of societal, institutional, interpersonal transformation” (Flacks, 1996:104).

Such transformation which aims to resolve the existing disparity between theory and practice “is not realised by efforts to replace one ‘system’ with another” (Flacks, 1996:104). On the other hand, “the cure for the evils of democracy is more democracy” (Mencken, 1926:4).

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Bio-note

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How Effective is Our Feedback? Feeding Forward and Self-Regulation

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Abstract

Giving and receiving feedback is based on a number of stages, procedures, and factors that could determine whether the feedback is effective or not. The key stakeholders of feedback are the tutor and the student, who could work together towards building bridges, such as holding dialogues, giving and receiving constructive criticism. Ideally, feedback is not a one-way, top-down approach, where the tutor 'commands' the discourse, whilst the student is merely a passive recipient. In whatever form it is delivered, the feedback that is passed on to the student should be more than 'correcting' the work; it could involve a communicative approach whereby the tutor passes on salient information that the student may utilise to sharpen his or her work. Hence, the possession of feedback is not solely relegated to the tutor. Instead, there is a transference where the student claims ownership of the feedback, and thus becomes responsible for its implementation. The responsibility to do so should not be perceived by the student as though he or she were doing a favour to their tutor, but an action which is undertaken for their own personal benefit and gain. Rather than feeding 'back', it is transformed to feeding 'forward', as the tutor provides suggestions that help shape future writing or assigned work. This paper, which is the result of a doctoral study conducted by the author, aims to present some benefits and challenges of feedback. Whilst exploring various areas of feedback, it suggests that, by revisiting practices, perceptions, and conceptualisations, there can be a shift towards feed forward and eventually offer the possibility of harnessing students' autonomy and self-regulation.

Keywords: *feedback effectiveness, feed forward, self-regulation, autonomous learning.*

Introduction: Feedback variables and effectiveness

The domain of feedback is multifaceted and, for a number of reasons, can be a source of contention for both educators and students. There are a number of variables at play, and these may impinge on the effectiveness of feedback, such as whether it

translates into better-quality writing. Research indicates that there are at least four variables that might affect effectiveness: the timing of feedback; the type of feedback (whether it is directive or facilitative); the media (this refers to the format, whether it is spoken, written or online); and the load of feedback 'correction' and comments (which refers to the amount of information) (Handley et al., 2011, p.544). Part of the research conducted in a post-16 Maltese context (Xerri Agius, 2017) focused on the four variables above, as well as the language of feedback, which has emerged as a *fifth* variable that might shape feedback implementation. For this research, which was part of a doctoral study completed in 2017, a grounded theory approach was adopted. The data, which was gathered by means of semi-structured interviews, was analysed inductively, without *a priori* assumptions. The methodological framework and data analysis led to emergent patterns and the creation of a themed codebook, which consequently shaped the findings and discussion.

Variable 1: Timing of feedback

Discussing and reflecting on the type of feedback that students receive and what occurs after it is in their hands is crucial because feedback does not merely serve the purpose of correcting students' work and making them aware of their faults. Feedback may also be used as an integral tool in fostering the students' ability to be self-critical and self-sufficient.

The first two suggested feedback conditions that can influence a productive learning environment are timeliness and clarity of feedback (Gibbs and Simpson, 2004). The former has emerged as essential in influencing its subsequent implementation. However, very often the teachers and students in the researched context felt that there were time delays between spoken and written feedback (Xerri Agius, 2017).

The time delay refers to the amount of time between writing the essay, discussing it in class, the essay being marked by the teacher at home or at the workplace, and the essay being returned with comments in the following session (so approximately two weeks go by before the student receives the feedback). Parkin et al. (2012) suggest that 'close proximity' between writing and feedback, such as through an online portal, would make the feedback 'more meaningful' (Parkin et al., 2012, p.966). Buckley (2012) concurs that retention is not affected if feedback is 'delayed by one, two or three days' (p.244), but there is less likelihood of retention if teachers provide feedback on students' essays *more than seven days* after the work has been written or handed in. A time lapse between spoken and written feedback can lead to the value of feedback being lost.

Variable 2: Type of feedback

The second variable focuses on the different types of feedback, which may be directive (also known as summative), or facilitative (also known as formative) (Black and Wiliam, 1998). The former entails correcting students' essays, and is almost always accompanied by the assigning of marks for assessment purposes. mark for assessment purposes. Conversely, facilitative feedback is meant to guide students to address their errors or issues for future writing. Engaging with formative feedback can promote self-assessment in that students become more responsible for their development. This is part of a constructivist perspective aimed at promoting formative rather than summative feedback. For example, comments would include an explanation rather than merely point out what is missing or 'wrong' (Sadler, 1989). Orsmond et al. (2013) corroborate this action by stating that 'if students are not engaging with the feedback provided then it is less likely that improvements can be made in the future' (p.242). For students to be more engaged with the feedback, they could be guided to understand the perimeters and definitions within which it operates. The language of feedback is related to this.

Another bifurcation of feedback is direct ('explicit written correction') vs. indirect (errors indicated through a code or underlining) (Srichanyachon, 2012, p.10), with the latter being more focused on fostering student autonomy and allowing them to plan for future writing. Indirect feedback is more meaningful because it enables students to reflect on improving writing with specific foci (Miceli, 2006).

Variable 3: Media of feedback

The next variable is the media of feedback, on which there are divergent views, with those who believe spoken is more effective than written feedback, and vice versa. Ideally, formats of feedback are varied and balanced between spoken and written, whilst also including feedback provided in a digital format and through online portals. In more innovative settings or where long-distance learning is involved, feedback can be transmitted as audio feedback, such as a podcast or audio feedback (Gould and Day, 2013). Yet, the research conducted in the post-16 context mentioned earlier (Xerri Agius, 2017) indicated that most teachers and students prefer one-to-one and face-to-face interaction. This is corroborated by Guichon et al.'s (2012) analysis of Long's (1996) interaction hypothesis, which promotes the idea of 'understanding why conversational interaction can help develop learner language competence' (p.182).

Irrespective of the form within which feedback is presented, recommendations are 'to be clear how assessment relates to learning objectives' (Cliff Hodges, 2009, p.274). What is more, students themselves 'need to be clear, too' of such objectives

(Cliff Hodges, 2009, p.274). By integrating different modes of feedback into one's practices, one can gauge what works best with students, depending on the situation, task, and students' aptitude.

Variable 4: Load of feedback

The penultimate variable refers to the load or amount of feedback. More is not necessarily better. In the research conducted locally (Xerri Agius, 2017), students considered that facing an essay replete with comments and error correction can be daunting and disheartening to follow up on for future work. Similarly, Court (2014) expressed concern with the quantity-over-quality debate, suggesting that conciseness of feedback could prove more helpful than copious amounts of comments. Feedback could be presented as 'detailed, explanatory comments' but there is a contradiction, because this too often leads to 'sheer quantity... [which is] largely viewed as unhelpful' (Court, 2014, p.331). Research (Xerri Agius, 2017) suggests that the ideal and more realistic number of comments is *three*, because students would not be overwhelmed by the amount, the comments would be more easily remembered, and the foci for improvement would be more manageable.

Variable 5: Language of feedback

The last variable is the language of feedback, which includes elements such as the actual wording within which feedback is couched, the tone of voice, and the body language used by the tutor when communicating the feedback. The language used in the comments is crucial in preparing the students' reaction to feedback. It is suggested that students' development 'is likely to be enhanced if they receive some clear constructive feedback' (Cliff Hodges, 2009, p.274). Ideally, comments do not 'focus [solely] on the negative', are not 'too general or vague', and most importantly, are not 'unrelated to assessment criteria' (Weaver, 2006, p.379).

When the language of feedback is couched in straightforward language, is delivered clearly and with goal-oriented foci, and is communicated in a friendly, supportive environment, it may have a seminal role in helping 'students to achieve goals to a greater extent than they would without peers or tutors' (Merry and Orsmond, 2008, p.11).

Feedback aims and effectiveness

If not addressed consciously and mindfully, the above variables may disrupt the implementation of feedback insofar as effectiveness is concerned. However, despite

the above variables that may impact such effectiveness, one should not negate the transformative role that feedback can play in shaping students' autonomy. Rather, by understanding the types, foci, and modus operandi of feedback, the way to refine the methodology and enhancing the benefits can be paved. By commencing with the aims, and honing the intended targets of feedback, one can shape the methods and bolster the delivery of feedback.

The aims of feedback can be short-term or long-term; for example, improving spelling or superficial errors falls in the first category, whereas mastering higher-order skills, such as cohesion and logical argumentation, are long-term outcomes. Overall, seminal aims of feedback are: to mentor students so that they improve or sharpen the quality of their work, and so that they are on task; to demonstrate that learning has taken place; to fulfil the learning outcomes; to help students become autonomous and, eventually, to guide them towards self-regulation. Below are the principles of good feedback (Table 1; Nicol and Macfarlane-Dick, 2006, p.7).

Good feedback:
• helps clarify what good performance is (goals, criteria, expected standards);
• facilitates the development of self-assessment (reflection) in learning;
• delivers high quality information to students about their learning;
• encourages teacher and peer dialogue around learning;
• encourages positive motivational beliefs and self-esteem;
• provides opportunities to close the gap between current and desired performance;
• provides information to teachers that can be used to help shape the teaching.

Table 1 Principles of Good Feedback

Research on the effects of marks vs. feedback

The power of feedback means that it can be more than just words scribbled on the side of a student's piece of writing. Feedback could have more bearing on a student's progress than marks, despite the fact that the latter are what determine whether a student has passed or failed an assignment, test, or formal examination. Research suggests that although marks do 'inform students about their individual performance', they do not provide support or guidance because they 'barely exhibit any of the characteristics of feedback described as beneficial' (Harks et al., 2014, p.272). Instead, it is contended that 'planned' and 'specific' feedback 'is more likely to influence student performance' than marks alone, or feedback which is 'general or haphazard' (Paltridge et al., 2009, p.120). Process-oriented feedback has 'a more positive [and] indirect effect on students' interest and achievement change', when compared to grade-oriented feedback (Harks et al., 2014, p.284).

There may be latent psychological effects in assigning marks to work produced by students, for both the latter and tutors. Marsh (1992) argues that when a teacher assesses a student's writing by giving a mark, the former might feel 'regretful and embarrassed' upon realizing that the mark could 'undermine the trust that was developing with the student' (p.45). Despite such misgivings, students expect a mark and when it comes to feedback, they presume it to be the scrutiny of mechanical errors and language use; very few students expect the teacher to emphasise other central issues apart from those at sentence level (Campbell, 1998). However, the research data (Xerri Agius, 2017) revealed that students welcomed constructive criticism and feedback comments that went beyond mechanical errors. The majority of participating students expressed themselves positively when talking about their teacher's feedback; they mostly indicated that they try their best to utilise the feedback, although it is not always possible when the comments are too task-specific and have no bearing on the next task. It was suggested that feedback could be couched in terms that make it less specific and more universally applicable to different tasks. However, overall, the students felt that feedback offered them more of a safety net to fall back on than marks when preparing for the next task. Nonetheless, this did not always allay students' concern with marks over feedback, mostly in relation to the lack of time they had to apply the feedback (there are usually no opportunities of revising any work already handed in). As noted from the data, feedback was often described in terms of marks received (apart from the comments), which might underline the pre-existing culture of a concern with grades in Malta (Xerri Agius, 2017).

Conversely, feedback on its own can still make an impact, and there have been studies (e.g. action research) where the mark is delayed until after the student has tweaked the work based on the feedback. This system requires students to re-edit or improve their work following the tutor's suggestions, and only when this has been registered and the work re-submitted would the tutor release the mark. This is known as an 'adaptive release of grades', which is a process where students are given feedback to reflect and act upon before receiving their grade (Parkin et al., 2012). Although in theory this is a laudable system and may work with a handful of students, it can be met with some resistance because it inevitably leads to more marking and more writing for the tutor and students respectively. However, an online-based system may be set up so that the re-writing, re-submitting, and re-marking are more efficient and less time-consuming.

Research on feed forward and self-regulation

One seminal aspect of the term 'feedback' involves reflecting on the terminology; the emphasis seems to lie on '-back'. If one looks back on what the student has

done or produced, then it is retroactive feedback (Merry and Orsmond, 2008). Even if it underscores the strengths, it is mostly limited to underlining the student's weaknesses. If the feedback is restricted to marking errors or shortcomings in writing, it will be confined as it were on paper, boxed in the student's file, and whatever benefits emerge from it or are intended cease to develop. Instead, feedback can be proactive (Merry and Orsmond, 2008), or focused on what can be done to improve future writing. This is meant to propel the student to act on the feedback suggestions, transforming the 'back' to 'forward'. Looking ahead and believing in one's ability to out-perform oneself in the next task is empowering and encouraging to the student, who could be on the way to self-regulation.

Feedback may be used to locate and explain issues in writing that have emerged, or in order to point out areas for future development. One central aim of the concept of 'feed forward' (Walker, 2009; Price et al., 2011, p.880) is for 'learning from feedback to inform future assignments', in a way that the teacher's suggestions and recommendations 'can be utilised by the student to inform their efforts in future assessments' (Orsmond et al., 2013, p.242). This notion is arguably underestimated or neglected in discussions on feedback.

A suggested link between feedback and learning is in the form of a 'continuum' where the two become 'intertwined' (Hattie and Timperley, 2007, p.82). For this, three steps in the form of questions are suggested: 'how am I going?', 'where am I going?', and 'what to do next?' (Hattie and Timperley, 2007, p.102). These questions lead to self-regulation as they shift the responsibility onto students, who become critics of their own work. Feedback given along a continuum may 'serve different purposes'. This does not only include the 'correction of errors, but is also 'concerned with developing new ways of knowing' (Price et al., 2011, p.880). In order to enhance such development, feedback needs to be usable.

'Usable' feedback

For the student to come closer to self-regulation, it is essential that any feedback is 'usable' (Walker, 2009). This means that the student can understand, interpret, and adopt feedback comments in future assignments. Such comments would enable students to work on improving their writing by also improving their self-perceptions (Walker, 2009). In the light of the principle of usability, one of the aims of the doctoral research was to shed light on the type of comments that are considered useful in shaping future writing. The area of 'usability' is relatively untapped, as Walker (2009) observes that not enough analysis has been conducted on which comments are 'usable', and subsequently feed forward enough to boost self-regulation. In particular, Walker (2009) emphasizes the 'nature' and the 'quality' of feedback as two elements that have not been researched enough.

Conclusion

Despite the lack of ample evidence of its full washback effect on learning and writing, there are opportunities for further research and implementation of feedback, whilst promoting feed forward and self-regulation practices. Feedback is and needs to be recognized as ‘a key element of the scaffolding provided by the teacher to build learner confidence and the literacy resources to participate in target communities’ (Hyland and Hyland, 2001, p.83). It has been noted that feedback has a pronounced effect on student cognition and motivation (Brown, 2001; Dweck, 2000; Murtagh, 2014). Cognitively, it provides students with information so they can understand their progress in learning and where to head next. On a motivational level, most students develop or gain a sense of control over their own learning and feel more confident. In this way, feedback is not only an indicator of performance but a tool to boost students’ motivation and make them feel more supported within the classroom or school environment (Richards and Lockhart, 1996). To this end, teacher feedback can serve as a powerful resource to retool students with necessary skills in the writing and self-regulation processes.

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Bio-note

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Generalisation – Graphs and Colourings

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Abstract

The interaction between practice and theory in mathematics is a central theme. Many mathematical structures and theories result from the formalisation of a real problem. Graph Theory is rich with such examples. The graph structure itself was formalised by Leonard Euler in the quest to solve the problem of the Bridges of Königsberg.

Once a structure is formalised, and results are proven, the mathematician seeks to generalise. This can be considered as one of the main praxis in mathematics.

The idea of generalisation will be illustrated through graph colouring. This idea also results from a classic problem, in which it was well known by topographers that four colours suffice to colour any map such that no countries sharing a border receive the same colour. The proof of this theorem eluded mathematicians for centuries and was proven in 1976. Generalisation of graphs to hypergraphs, and variations on the colouring theme will be discussed, as well as applications in other disciplines.

Keywords: *graph theory, vertex colouring, generalization.*

Introduction

Graph Theory is an extremely vast and rich area of mathematics, falling under the broader topic of Combinatorics. Its origins trace back to the eighteenth century, the Swiss mathematician Leonard Euler and the city of Königsberg (now Kaliningrad).

In the early 18th century, the citizens of Königsberg spent their days walking on the intricate arrangement of bridges across the waters of the Pregel River, which surrounded two central landmasses connected by a bridge. Additionally, the first landmass (an island) was connected by two bridges to the lower bank of the Pregel and also by two bridges to the upper bank, while the other landmass (which split the Pregel into two branches) was connected to the lower bank by one bridge and to the upper bank by one bridge, for a total of seven bridges, as shown in Figure 1 (Reid, 2010). According to folklore, the question arose of whether a citizen could

take a walk through the town in such a way that each bridge would be crossed exactly once (Carlson, 2006).

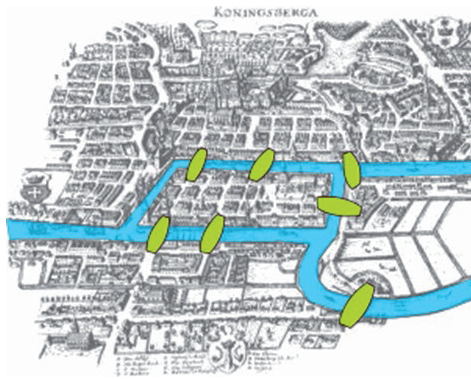


Figure 1

In 1735 the Swiss mathematician Leonhard Euler presented a solution to this problem, concluding that such a walk was impossible. He argued, that for this to be possible, for each bridge entering a land mass, there must be another bridge to allow an exit, meaning that each landmass, with the possible exception of the initial and terminal ones if they are not identical, must serve as an endpoint of an even number of bridges.

It would be several years before mathematicians would picture the Königsberg bridge problem as a graph consisting of vertices representing the landmasses and edges representing the bridges, as shown in Figure 2 (Carlson, 2006). The degree of a vertex of a graph specifies the number of edges incident to it. In modern graph theory, an Eulerian trail traverses each edge of a graph once and only once. Thus, Euler's assertion that a graph possessing such a path has at most two vertices of odd degree was the first theorem in graph theory (Euler, 1736).

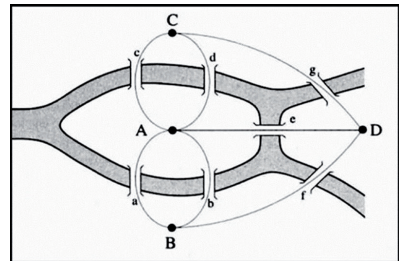
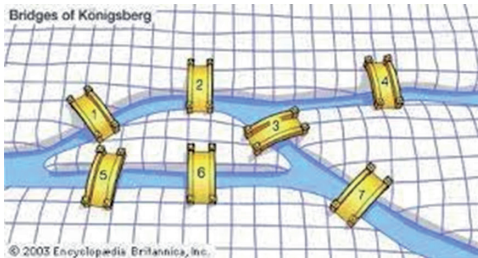


Figure 2

The aim of this paper is to explore the concept of generalisation in mathematics, which is one of the most important properties one considers when dealing with mathematical structures, through the theory of graphs, as well as the interaction between theory and application to real world problems. To further explore and discuss this notion, we consider the topic of graph colouring. We first give some basic definitions and results, and we then develop the various generalisations, both of the graph structure, as well as the concept of colouring.

We first give the formal definition of a graph. A graph is an ordered pair $G = (V, E)$ such that V is a set, called the vertex set, and E is a family of 2-element subsets of V , called the edge set, that is $E \subseteq \{\{u, v\}: u, v \in V\}$. In Figure 3, the vertices are the points A, B, C, D, E, F, G which are marked as nodes, and the edges are

$$\{\{A, B\}, \{A, E\}, \{B, E\}, \{C, D\}, \{C, E\}, \{C, F\}, \{D, E\}, \{D, F\}, \{F, G\}\}.$$

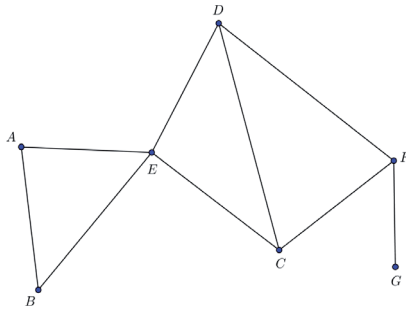


Figure 3

The structure and definition of a graph led to further studies, and several results and types of graphs were studied and constructed, as well as properties of such structures, some of which we give here, and others later on. As mentioned, the degree of a vertex is the number of edges incident to it. A graph is said to be simple if it has no loops or multiedges. A complete graph K_n is a graph on n vertices such that every pair of vertices are joined by an edge, that is the number of edges is $\binom{n}{2}$. A bipartite graph G is one in which the vertex set can be partitioned into two sets X and Y that is $V = V(G) = X \cup Y$ and $X \cap Y = \emptyset$, and such that any edge joins a vertex in X to a vertex in Y . A complete bipartite graph $K_{m,n}$ is one in which $|X| = m$, $|Y| = n$ and $E = \{xy: x \in X, y \in Y\}$, that is all possible edges joining a vertex in X to a vertex in Y .

When a graph is represented graphically, we consider the notion of a plane graph, which is a graph for which, in the graphical representation, no two edges cross each other. A graph is said to be planar if there exists a plane representation of the graph. Planar graphs are characterized by the famous Theorem by Kuratowski (Nishizeki & Chiba, 1988), which states that a graph is planar if and only

if it does not contain any subdivision of K_5 or $K_{3,3}$. A subdivision of an edge is the operation where the edge is replaced by a path of length 2, the internal vertex added to the original graph. A subdivision of a graph G is a graph achieved by a sequence of edge-subdivisions on G .

Arguably, one of the most famous theorems in graph theory is the Four Colour Theorem (for a history of this see (Mitchem, 1981)). This states that, given any separation of a plane into contiguous regions, producing a figure called a map, no more than four colours are required to colour the regions of the map so that no two adjacent regions have the same colour. The set of regions of a map can be represented more abstractly as a graph that has a vertex for each region and an edge for every pair of regions that share a boundary segment. The resulting graph is always planar. Hence, in graph-theoretic terminology, the Four Colour Theorem states that the vertices of every planar graph can be coloured with at most four colours so that no two adjacent vertices receive the same colour. It is generally accepted that this is what initiated the study of vertex colourings in graphs. The proof of this “well-known fact” eluded mathematicians for over 100 years and was finally proved by Appel and Haken in 1976 (Appel & Haken, 1976), the first major theorem to be proved using a computer. Through this problem, the notion of vertex colouring is introduced.

The paper is organised as follows: we first discuss generalisations of the graph structure in different ways, and give some ideas of possible applications. We then consider colouring, and look at various generalisations of this theme, leading to a unifying definition of the concept of vertex colouring of graphs and their generalisations, which encompasses all the possible variations discussed. Finally, we look at some interesting applications of graphs and colourings, particularly in computer science and telecommunication technology.

Generalisation of the Graph structure

If we look back at the formal definition of a graph, a graph is made up of a set of elements which we call vertices, and a family of subsets of this set, all of order two. This of course suggests that the structure can be generalised in more than one way. One such way is to give the edges direction, that is the edges are now ordered pairs of vertices, and are often referred to as arcs. We call this a directed graph, or digraph (Weisstein, 2000). Graphically we use an arrow on the edge to indicate its direction. A graph can be considered to be a special case of a digraph in which an edge can be considered to be two arcs, one in each direction. We will not dwell on this concept but rather look at the next idea of generalisation in more detail, particularly in the area of colouring.

Another way of generalising the graph structure is to remove the restriction of the size of the subsets, that is, rather than taking only subsets of size two, we can

take larger subsets of vertices. This gives rise to the concept of a hypergraph. A hypergraph is made up of a set of elements called vertices, and a family of non-empty subsets called hyperedges or edges, which can now be of any size. An r -uniform hypergraph is a hypergraph in which all edges are of size r . So essentially a graph is a 2-uniform hypergraph.

The idea of looking at a family of sets as a similar structure to a graph started around 1960, by Berge and Lovasz amongst others (Berge, 1997). In regarding each set as a "generalised edge" and in calling the family itself a "hypergraph", their initial idea was to try to extend certain classical results of Graph Theory. However, it was noticed that this generalisation often led to simplification; moreover, one single statement, sometimes remarkably simple, could unify several theorems on graphs. In addition, the theory of hypergraphs is seen to be a very useful tool for the solution of integer optimization problems when the matrix has certain special properties which involve scheduling and location problems.

Several graph operations and results were thus studied in this new context, amongst which was the concept of colouring. In the next section we shall look at the area of colouring and several variations on the original theme which result when we consider hypergraphs. For standard graph theoretical notation we refer to (West, 2000).

Colouring Graphs and Hypergraphs

As previously mentioned, the Four Colour Theorem is considered the first graph colouring problem to be posed. It led to the definition of a proper vertex colouring of a graph, that is an assignment of colours to the vertices such that no two adjacent vertices receive the same colour, as well as the chromatic number of a graph G , $\chi(G)$, which is the minimum number of colours required for a proper colouring of G . Several families of graphs were studied with the aim of determining their chromatic number. Clearly, one can see that the chromatic number of a bipartite graph is 2, and this is another characterisation of bipartite graphs, and the chromatic number of a complete graph K_n is n . The proof of the Four Colour Theorem finally showed that the chromatic number of planar graphs is 4.

An obvious extension to consider was the colouring of the edges of a graph. An edge-colouring of a graph is an assignment of colours to the edges of the graph so that no two incident edges have the same colour. In 1964, Vizing (Vizing, 1964) proved that the minimum number of colours needed to edge-colour a simple graph, termed the chromatic index χ' , is either its maximum degree Δ , or $\Delta+1$. What followed was a study to classify all known graphs as Class 1 if $\chi' = \Delta$, or Class 2, when $\chi' = \Delta + 1$. This classification is not yet complete.

The colouring of hypergraphs started in 1966 when Erdős and Hajnal (Erdős & Hajnal, 1966) introduced the notions of colouring and the chromatic number of a hypergraph, and obtained the first important results. From the definition, in a proper colouring no edge is allowed to be monochromatic. In the literature these colourings are sometimes called classic colourings. This generalization of graph colourings initiated a wide area of further research. First, some old problems in set systems were formulated as colouring problems and many results in graph colouring were extended to hypergraphs. For example, using a natural generalization of the degree of a vertex, the classic theorem of Brooks', which for classic graph colouring states that the chromatic number is at most Δ , except for complete graphs and odd cycles (Brooks, 1941), was shown to hold for hypergraphs (Berge, 1989).

The fact that hypergraphs can contain more than two vertices in an edge allowed the exploration of different and more restricted colouring notions. The classic concept of hypergraph colouring is asymmetric: with the chromatic number as its central notion, this theory focuses on the minimum number of colours, while the maximum number of colours has no mathematical interest since a totally multicoloured vertex-set is always feasible. However, one can now consider the maximum number of colours when excluding polychromatic edges.

Voloshin (1993) introduced the concept of a mixed hypergraph colouring, which eliminated the above asymmetry and opened up an entirely new direction of research. Instead of $H = (V, E)$, the basic idea is to consider a structure $H = (V, C, D)$, termed a mixed hypergraph, with two families of subsets called C-edges and D-edges. By definition, a proper λ -colouring of a mixed hypergraph $H = (V, C, D)$ is a mapping $c : V \rightarrow \{1, 2, \dots, \lambda\}$ for which two conditions hold:

- every $C \in C$ has at least two vertices of a Common colour;
- every $D \in D$ has at least two vertices of Different colours.

A mixed hypergraph in which each edge is both a C-edge and a D-edge is called a bihypergraph (Voloshin, 1993). Here we require that each edge is non-monochromatic and non-rainbow (polychromatic), or NMNR for short, as termed in (Caro, et al., 2015). Note that, for classic graph colouring, a graph may be considered to be a 2-uniform mixed hypergraph in which all edges are D-edges.

This concept led to the discovery of new principal properties of colourings that do not exist in classical graph and hypergraph colourings: first of all, we now look at a lower chromatic number $\underline{\chi}$ and an upper chromatic number $\bar{\chi}$. The chromatic spectrum of a hypergraph H is the set of values k such that $\underline{\chi} \leq k \leq \bar{\chi}$ and H is k -colourable. We now have hypergraphs which are uncolourable, and perhaps most counterintuitively, which have gaps in the chromatic spectrum, that is there may exist integers a, b where $a < b$, such that the hypergraph H is a -colourable and b -colourable, but not t -colourable for some $a < t < b$.

So with the more general structure of a hypergraph, new concepts in vertex colourings emerged, such as mixed hypergraphs, and this led to further vertex-

colouring variations. Bujtás and Tuza (2009) define colour-bounded hypergraphs as follows. We are given two integers, s_i and t_i associated with each edge e_i – a proper colouring requires that for each edge e_i , the number of colours used lies between s_i and t_i (inclusive). We can have a colouring such that $s_i = \alpha$, and $t_i = \beta$ are the same for each edge – we call this an (α, β) -colouring (Caro, et al., 2015). Given a hypergraph H , we have a proper (α, β) -colouring if the number of colours for every edge lies between α and β . So, for an r -uniform hypergraph, an NMNR-colouring is equivalent to a $(2, r-1)$ -colouring, a classic colouring is equivalent to a $(2, r)$ -colouring. This again illustrates the idea of generalisation, where a new definition encompasses previous definitions as special cases. Some properties of NMNR-colourings, such as uncolourability and chromatic spectrum gaps, can be extended to (α, β) – colourings.

We now describe L -colourings and Q -colourings of r -uniform hypergraphs, which can further encompass several different types of hypergraph colourings described in the literature. Such ideas, which originated in Voloshin's seminal work in Jiang et al. (2002), were more explicitly studied in Milici et al. (2001), Griggs et al. (2008) and Quatrocchi (2001), and studied in much more generality for oriented graphs in Dvřrak et al. (2010). We define L - and Q -colourings as follows (Caro, et al., 2016).

Let H be an r -uniform hypergraph, $r \geq 2$ and consider $E \in E(H)$. Then a colouring of the vertices of E induces a partition π of r whose parts are the numbers of vertices of each colour appearing in E . This partition is called the colour pattern of E and is written as $pat(E) = (n_1, n_2, \dots, n_k)$, where $n_1 \geq n_2 \geq \dots \geq n_k \geq 1$ and $\sum_{i=1}^k n_i = r$.

For any edge $E \in E(H)$, we assign $Q(E) \subseteq P(r)$, where $P(r)$ denotes the set of all possible partitions of r . A colouring of the vertices of H is said to be an L -colouring, where $L = \{Q(E_i) : i = 1, \dots, |E(H)|\}$, if $\forall E_i \in E(H)$, $pat(E_i) \in Q(E_i)$. In the case when all the edges are assigned the same family of partitions Q , i.e. $Q(E_i) = Q, \forall E_i \in E(H)$, we call this a Q -colouring.

The main types which have been studied, some of which have already been mentioned, are now described in terms of L - and Q -colourings.

Two particularly important partitions of r will be used several times - the monochromatic partition (r) and the rainbow partition $(1, 1, \dots, 1)$. M and R are used to represent these partitions respectively.

- For classical graph colourings, $Q = \{\pi \in P(r) : \pi = R\}$.
- For classical colourings of hypergraphs, $Q = \{\pi \in P(r) : \pi \neq M\}$.
- In Voloshin colourings of hypergraphs or mixed hypergraphs (Voloshin, 1993), there exist two types of edges, D -edges and C -edges. A D -edge cannot be monochromatic, that is all vertices of the edge having the same colour, while a C -edge cannot be polychromatic (rainbow), that is all vertices having a different colour. Hence for all D -edges, $Q_D = Q(E) =$

$\{\pi \in P(r): \pi \neq M\}$, while for all C -edges, $Q_C = Q(E) = \{\pi \in P(r): \pi \neq R\}$, and $L = \{Q_C \cup Q_D\}$.

- A special case of this type of colouring is a non-monochromatic non-rainbow (NMNR) colouring, as discussed in (Caro, et al., 2015), which is a Q -colouring where $Q = \{\pi \in P(r): \pi \notin \{M, R\}\}$. Such hypergraphs are often referred to as bi-hypergraphs.
- An (α, β) -colouring of a hypergraph H , as described in (Caro, et al., 2015), is the case where $Q = \{\pi \in P(r): \pi = (n_1, n_2, \dots, n_k), \alpha \leq k \leq \beta\}$. This is based on the concept of colour-bounded hypergraphs first defined by Bujtás and Tuza in (Bujtás & Tuza, 2009). Observe that classical hypergraph colourings are $(2, r)$ -colourings, while NMNR-colourings are $(2, r-1)$ -colourings.
- Bujtás and Tuza defined another type of hypergraph colouring with further restrictions in (Bujtás & Tuza, 2009): a stably-bounded hypergraph is a hypergraph together with four colour-bound functions which express restrictions on vertex colourings. Formally, an r -uniform stably bounded hypergraph is a six-tuple $H = (V(H), E(H), s, t, a, b)$, where s, t, a and b are integer-valued functions defined on $E(H)$, called colour-bound functions. We assume throughout that $1 \leq s \leq t \leq r$ and $1 \leq a \leq b \leq r$ hold. A proper vertex colouring of $H = (V(H), E(H), s, t, a, b)$ satisfies the following three conditions for every edge $E \in E(H)$:
 - The number of different colours assigned to the vertices of E is at least s and at most t .
 - There exists a colour assigned to at least a vertices of E .
 - Each colour is assigned to at most b vertices of E .
 Hence, such a colouring is a L -colouring where L is a family of Q_i such that for each Q_i , $Q_i = \{\pi \in P(r): \pi = (n_1, n_2, \dots, n_k), n_1 \geq \dots \geq n_k, s \leq k \leq t, a \leq n_1 \leq b\}$.
- Another type of colouring which has been defined is conflict-free colouring, in which each edge contains a vertex with a “unique colour” that does not appear on any other vertex in E . The surveys (Pach & Tardos, 2009) and (Smorodinsky, 2013) include interesting results about, and applications of this type of colouring. In this case, $Q = \{\pi \in P(r): \pi = (n_1, n_2, \dots, n_k), n_1 \geq n_2 \geq \dots \geq n_k = 1\}$.

This illustrates the power of generalisation, one of the main praxis in mathematics. What started as a single structure (the graph) and a defined concept for it (vertex colouring), led to variations of both structure and defined concept, leading to one unifying definition such that every variation can be described as a restricted case of this definition.

Applications

Mathematical structures, concepts and results are interesting in themselves, but more so when they prove to have important applications in solving problems from other disciplines. As we have seen, structures themselves are often the results of trying to solve an existing problem. We now look at a few applications of some of the results and methods which we have discussed.

We have seen that the main inspiration for the definition and study of vertex colourings in graphs was the Four Colour Theorem. The Groupe Spécial Mobile (GSM) was created in 1982 to provide a standard for a mobile telephone system. The first GSM network was launched in 1991 by Radiolinja in Finland with joint technical infrastructure maintenance from Ericsson. Today, GSM is the most popular standard for mobile phones in the world, used by over 2 billion people across more than 212 countries. GSM is a cellular network with its entire geographical range divided into hexagonal cells. Each cell has a communication tower which connects with mobile phones within the cell. All mobile phones connect to the GSM network by searching for cells in the immediate vicinity. GSM networks operate in only four different frequency ranges. The reason why only four different frequencies suffice is clear: the map of the cellular regions can be properly coloured by using only four different colours! So, the vertex colouring algorithm may be used for assigning at most four different frequencies for any GSM mobile phone network.

In fact, several applications of hypergraphs and hypergraph colouring in the world of telecommunications, particularly in the solution of resource allocation. One such example involves wireless communication, which is used in many different situations such as mobile telephony, radio and TV broadcasting, satellite communication, etc. In each of these situations a frequency assignment problem arises with application-specific characteristics. Several different modelling approaches have been developed for each of the features of the problem, such as the handling of interference among radio signals, the availability of frequencies, and the optimization criterion. The work described in Even et al. (2003) and Smorodinsky (2003) proposed to model frequency assignment to cellular antennas as conflict-free colouring. In the model developed in this research, one can use a very “small” number of distinct frequencies in total, to assign to a large number of antennas in a wireless network.

Another interesting application of mixed hypergraph colouring is the Byzantine agreement problem (Jaffe, et al., 2012). A set of n processors, any f of whom may be arbitrarily faulty, must reach agreement on a value proposed by one of the correct processors. The system is said to be f -tolerant if there is a protocol which ensures that after a finite number of steps, all correct processors receive the right value. It is a celebrated result that unless $n > 3f$, Byzantine agreement is impossible, due to the fact that faulty processors can equivocate, that is, say different things to

different processors. It has been found that if all processors are grouped into all possible triplets to form a complete 3-uniform hypergraph such that within triplets, equivocation is not possible, then equivocation can be avoided across all processors and the system can be made Byzantine f -fault tolerant even when $n > 2f$. However, using all possible triplets as communication problems is too expensive in terms of algorithmic complexity. Using vertex-colouring theory, conditions for which a system is f -tolerant can be found without considering all possible triplets, this reducing processing time significantly.

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Bio-note

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