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Exploring, Exploiting and Nurturing the Strong Link between Green Chemistry Education (GCE) and Education for Sustainable Development (ESD)

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Abstract

Green chemistry was born in the early 1990s as a bold and concrete commitment by the chemistry community to design safer chemical products and processes for a more sustainable world. It is often considered as an unorthodox yet smarter application of chemistry which protects human health and the environment in an economically viable and sustainable way. It is also the new inevitable paradigm for chemistry to meet the challenges of sustainable development.

The emergence of green chemistry entailed sharing this new philosophy and methodology of doing chemistry with other chemists and students aspiring for a chemistry-related career. Education was immediately identified as the most effective medium to propagate the green chemistry message to students and society at large.

Science educators realised the overlap between the fundamental green chemistry principles and the overarching concept of sustainable development, and viewed this as an opportunity to infuse sustainability issues in chemistry and science education.

This paper investigates such an intersection between green chemistry education and education for sustainable development, and attempts to identify potential ways and means of implementing some significant aspects of sustainability in pre-university curricula.

This study looks into both the educators' and students' perspectives of such an educational endeavour, taking into account the logistics such as resources, training and any potential barriers in teaching these basic principles of sustainable science, as well as the impact on learning such as motivation to study chemistry, moral and ethical thinking skills, environmental awareness and an understanding of the role of science in society.

Keywords: *green chemistry, green and sustainable chemistry, green chemistry education, education for sustainable development, sustainability science*

Background

The concepts of 'sustainability', 'sustainable development', 'green chemistry' and

'sustainable chemistry' were virtually born at the same time, possibly emerging from the same 'cradle' in an ingenious move by a number of well-meaning pioneers, including scientists, environmentalists and policy-makers, to preserve and safeguard life on earth for present and future generations.

It is a known fact that science, and chemistry in particular, influence virtually all aspects of our life on earth. Hence, science and chemistry educational curricula must reflect more profoundly the growing importance of sustainable development and support a stronger relationship between human civilization and the environment. After all, the ultimate goal for science curricula is not simply to highlight the importance of scientific disciplines in everyday life but also to foster the interrelationship between humans and human habitats. Such a strong emphasis to the importance of a concerted effort to defend the common good and preserve the world heritage will hopefully motivate the students of today to learn and gain the basic skills, values and competences which empower them to shape society in a positive sustainable way (Rauch 2015) while avoiding the past mistakes committed by our forefathers and the leaders of yesterday.

It is generally accepted that the term 'sustainability' and related concepts, gained prominence in the 1980s, and is associated with the Brundtland Report referred to as 'Our Common Future' which was adopted by most of the countries of the world in 1987 (Brundtland 1987). This marked perhaps the first significant effort of humanity to react to the environmental problems resulting from the booming chemical industry (fuelled by the huge success of chemical technology), well documented by Rachel Carson in her highly influential novel 'Silent Spring' way back in 1962. This publication brought several environmental issues to the forefront and created an unprecedented public awareness on pollution and environmental protection. This work catalysed environmental activism and launched the global environmental movement in the late 19th century in a bold effort to stop environmental degradation and protect natural resources (Carson 1962).

The concept of 'sustainable development' sought to combine the salient environmental concerns brought about by the industrial revolution (epitomised by large scale pollution and environmental disasters), with social and economic development (Council on Foreign Relations 2020).

Strictly speaking, the concept of *sustainability* had been used and referred to, in different contexts and using different connotations, since ancient times. It is claimed that it originated in Germany and appeared in a handbook of forestry in 1713 (World Energy 2014). The term used, which at that time was referred to as 'sustained yield', was meant to imply 'never harvesting more than the forest can regenerate'.

However, with time, a number of global changes such as the explosion in world population - estimated as 7.98 billion in year 2022 (Worldometers 2022) and projected to increase by 25% to reach a staggering 9.9 billion by the year 2050 - (U.S. Census Bureau 2016, Kaneda et al. 2020), increased consumption of food, the industrial revolution and the inevitable alarming rate of depletion of natural

resources, all contributed to raise the public awareness to manage the environment in a more sustainable way in order to our current and future standard of living. All this paved the way to the adoption of the new term 'sustainable development' (Du Pisani 2006).

The concept of *sustainable development* was coined in the early 1970s and was introduced as a compromise between the notions of 'development' (a qualitative change synonymous with exploitation of resources) and 'conservation' (a quantitative change referring to protection of resources), and a solution to problems related with economic growth and industrialisation (Paxton 1993, Viederman 1993). It was one of the main themes discussed in the U.N. Conference on Human Development in Stockholm, in 1972.

The new concept or rather paradigm of sustainable development was further developed and popularised during international fora such as the World Conservation Strategy (1980), the U.N. World Commission on Environment & Development, UNWCED (1987), and the U.N. Conference on Environment & Development in Rio de Janeiro (1992), the latter known as the Rio Earth Summit. The most commonly agreed definition of Sustainable Development is that included in the previously cited Brundtland Report which actually placed environmental issues in the limelight, right in the centre of the global political agenda.

> "Sustainable Development is the (social) development which meets the needs of the present (generations) without compromising the ability of future generations to meet their own needs." (WCED 1987)

So, the mission of such a new important standard was to guarantee a better quality of life for everyone, both now and for generations to come. The objective of sustainable development was described in other terms, as an attempt "to use resources no faster than they regenerate themselves and release pollutants to no greater extent than natural resources can assimilate them" (Merkel 1998).

This grand idea which was originally criticised by many because of its ambiguity (Robinson 2004) was eventually embraced by the majority of governments, NGOs and society at large, as a point of departure and a point of continuous reference to secure a safer planet today and tomorrow (Muñoz Ortiz 2006).

The Global Goals of Sustainable Development

The Sustainable Development Goals (SDGs) emerged in 2012 at the U.N. Conference on Sustainable Development in Rio de Janeiro, Brazil, i.e. during the Rio+20 Earth Summit. The main objective was to draw up a set of goals in order to meet the environmental, political and economic challenges facing the entire world. The SDGs were meant to supersede the set of eight international Millennium Development Goals (MDGs) which had started a global effort in the year 2000 to tackle the shame

and embarrassment of poverty within a 15-year timeframe (Fukuda-Parr 2004, WHO 2005).

The new set of international goals were adopted by all 193 U.N member states (representing practically all countries of the world) in 2015, to serve another 15-year timespan. The 17 global goals for year 2030, which are broad and interdependent, are now considered as a blueprint to achieve a better and more sustainable future. They provide guidelines and no less than 169 specific targets which describe in detail how to measure and achieve these goals. They form part of the resolution of the U.N. General Assembly, known as the '2030 Agenda' for sustainable development (DESA 2016).

The following are the Global Goals for Sustainable Development for year 2030.

Figure 1: The 17 Sustainable Development Goals of the United Nations

SOURCE: https://ied.eu/blog/sustainable-development-goals-and-the-2030-agenda-how-ied-supports-sdgs/)

In a nutshell, the SDGs represent a unique collaboration between many stakeholders (representing the international business community, NGOs, policy makers and civil society) to end poverty, protect the planet and ensure that all people enjoy peace and prosperity (Axon, James 2018).

Crucial role of green chemistry in sustainable development

The concept of green chemistry may be regarded as the response of chemists and the chemical industry to the challenge of sustainable development. It presents a novel way of thinking about the practice of chemistry. In fact, green chemistry was

launched in the early 1990s and its origin is arguably linked to the U.S. anti-pollution legislation.

Green chemistry involves a combination of tools, techniques and technologies guided by a set of 12 scientific-based principles that help chemists look for alternative or renewable raw materials, design new chemical products and processes that are environmentally benign and efficient (that is, greener and more sustainable). These 12 principles of green chemistry introduced key concepts such as 'atom economy' and 'life-cycle-analysis' (LCA) which are based on sustainability and support some of the SDGs in their approach.

Figure 2: The 12 Principles of Green Chemistry

SOURCE: Harrison, E., Smith, H., & Dekker, I. (2021)

The universally accepted definition of **Green Chemistry** is that originally proposed by Paul V. Anastas and John Warner (widely regarded as the true founders and architects of contemporary green chemistry).

> "Green chemistry is the utilisation of a set of principles that reduces or eliminates the use or generation of hazardous substances in the design, manufacture and application of chemical products."
>
> (Anastas, Warner 1998)

Some authors argue that GC must not be regarded as a sub-discipline of chemistry (Kirchhoff 2014, Ravichandran 2011) but as a new approach of doing chemistry aimed primarily at protecting human health and the environment, in an economically viable and sustainable way. It also marks a significant shift from a culture of regulations and banning of chemicals to one based on designing safer (less

toxic, less hazardous) products with minimum waste (Sanderson 2011). It is also widely regarded as a unique contribution by science, through chemistry, towards sustainability. In fact, GC was precisely born to facilitate the achievement of many global challenges through the smart work of chemists who are committed to design and implement greener and more sustainable products and chemical processes.

Green chemistry is also frequently referred to with the alternative term **Sustainable Chemistry** (SC), and sometimes 'Chemistry for a Sustainable Development'. This is defined by the Office for Economic Cooperation & Development, OECD, as:

> "a scientific concept that seeks to improve the efficiency with which natural resources are used to meet human needs for chemical products and services."
>
> (van Roon et al. 2001, Carra 1999)

It has been suggested that SC refers to chemistry that address sustainability problems such as those addressed in the SDGs.

The use of these two separate terms, i.e. GC and SC and their respective definitions, has been the subject of a long debate (Hutzinger 1999, Poliakoff et al. 2018) with some authors still highlighting important differences between the two terms (Hill et al. 2013). It is argued that 'green chemistry' focuses mostly on concepts related to reducing waste, energy and risk to human and environmental health, without necessarily targeting long-term sustainability. Others claim that the broader term 'sustainable chemistry', which has been introduced more recently, puts more emphasis on industrial application and implementation, with innovations in chemistry targeting sustainability goals (for example, reducing greenhouse gas emissions, alleviating hunger and improving the quality of life). However, it is generally accepted that SC cannot be conducted in the absence of GC (Hogue 2019).

Although it is true that there is no general consensus among the scientific community on the use of these two terms because they may represent different purposes and interests of different chemists, it is equally true that they have now been endorsed universally and they are now being used interchangeably (Mandery 2013, Tundo 2008, Tundo 2012). Furthermore, many sources are today applying the merged term 'Green & Sustainable Chemistry' (GSC) and less commonly 'Green Chemistry for Sustainable Development'. After all, such terms are closely interrelated since the overall vision of GC is 'holistically aligned with environmental sustainability' (Hill et al. 2013).

Having said that, judging from the vast number of research articles, publications and other resources produced to date, the term 'Green Chemistry' is by far the one which is overwhelmingly preferred worldwide, as it is more user-friendly and embraces research, the use of sustainable technology and education (Linthorst 2010). It is also argued that, after all, 'genuine sustainable chemistry…. cannot be conducted in the absence of green chemistry' (Anastas, Zimmerman 2018).

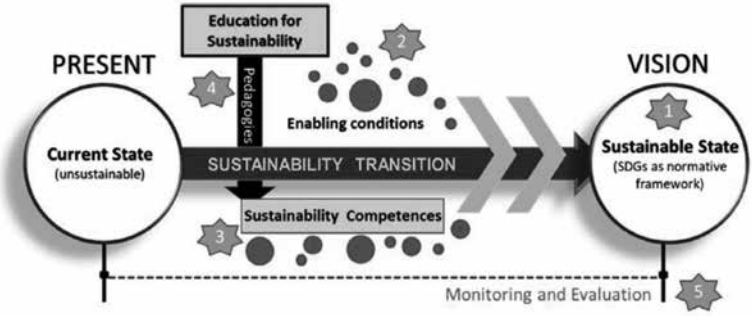
Transforming environmental education (EE) into education for sustainable development (ESD)

Literature suggests that Education for Sustainable Development (ESD) is very much related and overlaps with an earlier U.N. paradigm known as Environmental Education (EE), which knows its origin in the U.N. Conference on Human Environment in Stockholm in 1972 (McKeown, Hopkins 2005, Wesselink, Wals 2011). While it is true that both terms are defined in a different way and have a different perspective on how to educate citizens about environmental issues, there is a lot of common ground. In fact, EE and ESD share similar goals, are both multidisciplinary and both invoke behavioural change for environmental stewardship. Some sources suggest that though being distinct, EE has progressively evolved into ESD (Ärlemalm-Hagsér, Sandberg 2011).

Education for Sustainable Development was launched during the landmark Rio Earth Summit in 1992, as a response to educate citizens, particularly young generations still attending formal education, to address the mammoth task established and embodied by the concept of sustainable development. It became increasingly evident that education was to take centre stage on the achievement of the SDGs launched in year 2015. Over the last 2 decades, ESD has grown from an idea into real global movement (Hopkins 2012).

ESD is described as a lifelong learning process and provides quality education to learners of all ages and from all walks of life. It is the tool required to achieve sustainable development and aims to empower citizens with the right skills, knowledge, values and attitudes to take informed decisions and act responsibly and sustainably throughout their lives. ESD is cited specifically in SDG4 dealing with quality education, but is regarded as a 'key enabler' of the rest of the SDGs. UNESCO is the agency responsible for this global framework, overseeing the management, coordination and implementation of ESD (UNESCO 2021a).

Figure 3: A conceptual framework summarising the role of education to promote sustainable development



SOURCE: Kioupi, Voulvoulis 2019

According to UNESCO:

> "**Education for Sustainable Development** means including key SD issues in teaching and learning, e.g. climate change, disaster risk reduction, biodiversity, poverty reduction and sustainable consumption. It also requires participatory teaching and learning methods that motivate and empower learners to change their behaviour and take action for SD. ESD consequently promotes competences like critical thinking, imagining future scenarios and making decisions in a collaborative way."
>
> (UNESCO 2012a)

Such a detailed definition suggests that ESD involves 2 important features: content and pedagogy (Boeve-de Pauw et al. 2015). Literature shows that ESD is expanding in both aspects and is becoming progressively recognised and embraced worldwide (Hopkins 2012).

The interdependency of the SDGs and the complexity of the concepts of sustainability and sustainable development make it hard to relate the global goals to educational learning outcomes (Kioupi, Voulvoulis 2019). However, a number of strategies and pedagogies have been developed over the years to include more ESD in various curricula of different subjects and at different levels of education all over the world. UNESCO itself designed what it described as the 'ESD for 2030 Roadmap' outlining actions in five priority action areas, indicating amongst others, a clear policy, learning environments and building capacities of educators (UNESCO 2020). It even produced a set of educational resources in the form of a user-friendly manual, called the 'ESD Tookit', to help leaders and educators in their quest to promote ESD in communities and educational institutions (McKeown et al. 2002).

It is often believed that educators serve as models for their students (Cheung 2020) and are very influential in society. In fact, it has been estimated that teachers, on average, leave an impact lasting at least a 100 years, considering their influence during their career and later through the students they would have taught. This is why it is crucial to train educators to teach ESD is a systematic way (Aksela 2016, Kioupi, Voulvoulis, 2019).

The true success of ESD ultimately relies on the educators' commitment to sustainability and their competency and confidence in teaching its basic theory and content. Literature indicates that although educators tend to be interested in investigating and integrating concepts of SD in their curricula, they might experience a number of limitations. These include a lack of knowledge about the topic, training and collaboration among their colleagues, misconceptions, lack of financial and educational resources, overloaded curricula, non-environmental attitudes, lack of research and development, and lack of support and involvement of the school/ college administration (Kanapathy et al. 2019).

It must also be noted that the U.N. recognised the importance of ESD so much so that it declared the period 2005-2014 as 'The Decade of Education for Sustainable Development' (DESD). The objective was to integrate the principles, values and priorities of SD into all aspects of education including learning. It meant to catalyse changes in behaviour to create a more sustainable future by promoting the three dimensions of sustainable development (i.e. environmental integrity, economic viability and social equity).

So the ultimate task of the DESD was to 'reorient education towards sustainability' in the hope of changing attitudes and creating a sustainability mindset. After collecting and analysing data, the UNESCO (which was entrusted with the DESD project) came up with a Global Action Programme (GAP) on ESD in a bid to accelerate, scale up and intensify the change to an education that is more relevant to the world of today (UNESCO 2021b).

The road to green chemistry education

Teaching of chemistry plays a central role in the teaching of sustainable development by providing a number of opportunities to connect the subject with issues of sustainability. This can be done through the use of laboratory experiments, lectures and classroom discussions.

However, teaching the main chemistry theories and facts will not necessarily enable students to deal scientifically with the challenges of SD (Ware 2001). Some authors suggest that chemistry education should take a deeper role in ESD. They believe that ESD should be integrated in the chemistry and science curricula in a multi-dimensional approach, starting from compulsory school science education (Burmeister et al. 2012). This can be done, for example, by introducing the periodic table of elements, at an earlier stage of education, to teach about the composition and effects of greenhouse gases and measures required to minimise their emissions (Kanapathy et al. 2017). Chemistry can also address other challenges of environmental sustainability such as alternative or renewable sources of energy, healthcare, nutrition and quality control. Chemistry can also teach about producing novel materials and products, sustainable energy supplies, composition and properties of medicine and fertilisers (Burmeister et al. 2013).

Integrating ESD in chemistry education provides a golden chance of introducing a number of concepts, skills and practices related to sustainability which students can then relate to real life situations, making the subject more relevant to their daily lives (Juntunen, Aksela 2014).

Evidence suggests that including stronger connections between human sustainability and the chemistry curriculum leads to a win-win situation as it brings a number of benefits to the students, the academic discipline itself and the planet in general (Middlecamp 2019).

It follows that chemistry educators have to make sure that besides engaging all students in learning the subject content, they also have to motivate them to learn how chemistry has the potential to meet today's global challenges.

The emergence of GC in the 1990s was followed by the growing need of its exponents to share their new philosophy and methodology of doing chemistry with fellow chemists and students aspiring for a chemistry-related career. In fact, as in the case of SD, education was soon recognised as the ideal medium through which the GC message could be diffused among students, professionals and even society at large (Wardenchi et al. 2005).

Teaching of GC was found to be an effective way of highlighting the importance of chemistry for SD (Burmeister, Eilks 2012). In fact, teaching of green and sustainable chemistry (GCE or GSCE) usually involves a discussion of sustainable development as this allows learners and educators to address in an ethical way the various environmental issues faced by local and international communities (Haack, Hutchison 2016, Pavez et al. 2018). A growing body of literature suggests that this has, in fact, become an urgent matter when one considers that ESD is making slow progress and is still virtually absent in many science and chemistry curricula in many countries (e.g. Vilches, Gil-Perez 2013, Karpudewan et al. 2011, Boeve-de Pauw et al. 2015, Juntunen, Aksela 2014). Hence there is still a significant potential and a strong desire to infuse GSCE in mainstream education (Zuin et al. 2021). Evidence suggests that teaching a more sustainable chemistry entails GC practices (Burmeister et al. 2012) as GC has always been known to be 'the chemistry of sustainability' (Beach et al. 2009).

GCE (or GSCE) has two main objectives:

- to cultivate and enhance scientific literacy in sustainability;
- to develop and propagate corresponding skills among current and future generations.

(Anastas, Warner 1998). Teaching GC promotes a number of scientific principles aimed to safeguard the environment and prevent or reduce environmental pollution. Hence when 'teaching of GC' is integrated with ESD, one instils in students a greater sense of environmental awareness, positive attitudes towards environmental issues and a motivation to behave more sustainably (Chen et al. 2020). Exponents of GC recognise that knowledge of GC alone, no matter how crucial, extensive and effective, will not create a sustainable civilisation (Anastas, Zimmerman 2018). People's behaviour can only change through sustainability education as this aims to prepare future generations of responsible citizens and to start and foster a mainstream culture based on the principles of SD.

Literature shows also that the teaching and learning of GC for SD can adopt learning models that connect real-life situations with wider human concerns involving the environmental, economic and social aspects of SD.

GCE has a history of about 30 years, during which there have been many attempts and approaches to integrate concepts and practices of GSC into the chemistry curriculum (Haack, Hutchison 2016, Bastin, Dicks 2019). Examples include:

- programmes designed specifically to integrate completely the 12 GC principles across the chemistry curriculum (Cann 2001; Timmer et al. 2018);
- separate, stand-alone GC elective courses (University of Toledo 2021);
- GC laboratory programmes (Doxsee & Hutchison, 2003; Timmer et al, 2018; University of Minnesota 2021);
- GC initiatives outside the traditional classroom setting (Waked et al. 2019; Zuin, Eilks 2019);
- using controversial socio-scientific issues from sustainability challenges related to chemistry (Zuin, Eilks 2019);
- integrating chemistry learning with ESD-driven development of educational policies (Zuin, Eilks 2019).

The concepts of GC can alternatively be taught in training course and research activity, along with other disciplines. This requires the collaboration between life scientists and social scientists in an effort to develop new sustainable solutions. Such an interdisciplinary approach warrants the integration of GC curricula with both science-related disciplines (e.g. biology, ecology, artificial intelligence) and non-science-related ones (e.g. psychology, philosophy, business and ethics). Such programmes have a strong potential to educate and increase motivation in advanced students towards a greater sustainability (Chen et al. 2020).

Despite all these and similar efforts and initiatives, it is considered that the principles of GSC have not yet sufficiently integrated in the standard undergraduate chemistry curriculum.

The idea of blending chemistry and SD in pre-university curricula is also gaining support as educators are increasingly become aware and recognising the importance of incorporating the concepts of GC in different levels of education and different settings including high schools, colleges and other institutions (Haack et al. 2005, Anastas, Beach 2009, Eilks, Rauch 2012, Mandler et al. 2012, Jegstad, Sinnes 2015, Aubrecht et al. 2015, Karpudewan et al. 2015, Fenech Caruana 2015, Linkwitz et al. 2021). Other literature confirms that education and society at large would be significantly improved if students were exposed to the philosophy and practice of GSC at an earlier stage (Wardenchi et al. 2005, Braun et al. 2006, Savitskaya et al. 2012).

A number of theoretical frameworks have been proposed on the most effective ways to include GC and ESD concepts in chemistry education, particularly at secondary and post-secondary levels (Burmeister et al. 2012, Fenech Caruana 2018, Linkwitz, Eilks 2019, Ballard, Mooning 2021, Linkwitz et al. 2021).

Burmeister et al. (2012) devised a combination of strategies involving application GC in the school laboratory, subject content, classroom discussions and school development policies based on ESD.

A Norwegian study (Jegstad, Sinnes 2015) developed this model further and combined the principles of GC and SD in the chemistry curriculum by referring to five inter-related aspects of ESD, namely,

- chemical content knowledge (tackling topics such as biofuels and life-cycle analysis);
- chemistry in context (by making the subject more relevant through individual, societal and vocational experiences);
- exploiting the uniqueness of teaching or learning chemistry (e.g. macro, micro and symbolic dimensions of the subject);
- applying sustainable practices in chemistry;
- ESD competences such as systems thinking, problems solving, creativity, critical thinking, action competence, communication and collaboration.

On the other hand, a Finnish project (Aksela 2016) developed a strategy on how to train chemistry teachers in ESD based on a number of areas such as:

- teaching of chemistry in context (e.g. climate change);
- the four dimensions of sustainable development (society, environment, culture and economy);
- pedagogical content knowledge (required for microcomputer-based laboratory teaching);
- exploiting modern technology in teaching.

There is a growing consent that GC should feature more prominently in chemistry education across all sectors. Clearly, there is a number of potential benefits associated with the introduction of GC even at lower levels of education. These include:

- relating traditional chemistry concepts to the real world context;
- connecting chemistry with other school subjects and aspects of students' lives;
- attracting bright students to the chemistry-related professions;
- students to become more scientifically literate and better citizens (Braun et al. 2006, Goes et al. 2013, Anastas, Beach 2009, Bradley 2002).

Students experiencing GSCE also develop a critical mind by gaining higher-order thinking skills (e.g. analysis, evaluation, synthesis) which enable them to react to the complex sustainability issues in line with the principles of SD (Chen et al. 2020).

Overcoming barriers to green and sustainable chemistry education

As in the case with ESD, the initiatives taken so far to disseminate GSCE across the science and particularly the chemistry curricula, were not yet sufficiently coordinated. Hence, despite registering remarkable progress, this ambitious educational project is still considered, as 'a work in progress' (MacKellar et al. 2020, Linkwitz et al. 2021).

In fact, although the process of integrating the content and theory of GC was partly successful in many institutions across the globe it still encounters a number of persistent obstacles along the way, making it harder for educators and policy makers to make further inroads at a faster pace. Some of these obstacles have been identified to be:

- lack of knowledge about GC among staff / educators;
- a crowded chemistry curriculum with so much fundamental theories regarded as essential;
- a limited number of pedagogical material currently available, including greener laboratory experiments;
- few educators and decision-makers were experienced enough or in a position to update and green the curriculum accordingly;
- a sense of scepticism or inertia by a number of established educators and scientists to adopt the GC approach (i.e. professional and institutional resistance);
- prioritising on research and publications at the expense of creating and budgeting for the necessary resources required to affect such an educational reform (Clark et al. 2012, Kopnina 2012, Haack, Hutchison 2016, Zuin 2019, Zuin et al. 2021).

This is not a complete list and literature reveals further possible complications such as the language barrier (which may limit access to international literature), lack of financial, social and economic support and other issues related to definitions and GC metrics used by different academics and decision makers (Matus et al. 2012).

All these barriers tend to reduce awareness among potential educational stakeholders and need to be addressed continuously in order to allow GSCE to flourish and boost the propagation of the broader and parallel concepts of SD.

One effective way to overcome most of the above-cited barriers is to produce and continuously promote updated and relevant educational material and make it immediately accessible to educators. Although the first published educational resources were mostly addressed to an undergraduate and postgraduate audience, the situation is progressively changing and it now includes an increasing number of books and online material that have been adapted to reach other levels of education and the community at large.

Current open educational resources about GSC, that are available to educators and students alike, include a number of textbooks, laboratory manuals, short publications, research and education networks, webinars, graded laboratory activities, educational videos and even initiatives intended for young schoolchildren.

There are other methods through which students and teachers can get more involved in green and sustainable chemistry. These include participation of students in outreach activities organised by the various GSC institutions and centres proliferating in various parts of the world, voluntary participation of teachers in

workshops, training courses and summer schools organised periodically by various accredited organisations and universities (Fenech Caruana 2015, Green Chemistry Institute 2021a, Royal Society of Chemistry 2021).

Infusing sustainability in education

More than ever, the world needs quality education to promote the essence of sustainable development. Science, and chemistry in particular, play a critical role in disseminating the concepts of sustainability and help solving the global challenges through various ways including research, innovations and education.

Literature strongly points out that the most effective way to implement concepts of SD in education is by embracing and integrating the principles of GSC in newly designed curricula and to adapt them to different levels of education, starting from the years of compulsory science education up to university. This has to be complemented by the continuous professional development of educators, providing them with the appropriate tools (updated textbooks and other resources) and pedagogies to be able to motivate their students accordingly.

All this is becoming urgent and a global joint effort is required to create and promote a strategy and possibly a road map to mainstream GSC concepts and practices into the science or chemistry curricula and as part of a broader, cross-curricular, multidisciplinary ESD. This has already been launched recently, at university level, through the action spearheaded by the Green Chemistry Institute of the American Chemical Society in an initiative denominated as the 'Green and Sustainable Chemistry Education Road Map'. Such a strategic masterplan has a clear vision which describes a number of green and sustainable core competences and promotes a number of initiatives required to achieve the same vision of training and inspiring chemists to overcome the global challenges of sustainability (MacKellar et al. 2020, Green Chemistry Institute 2021).

What needs to be done, from now on, is to construct an adapted version of such a roadmap which enables pre-university students and educators to adopt a systematic strategy to ensure the optimisation of teaching and learning of the basic tenets of sustainability. This has to include a number of features such as:

- designing new programmes for GSCE including appropriate concepts, clear objectives, pedagogies and methods of assessment;
- promoting and propagating best practices through the integration of GSCE in chemistry and other curricula in the right educational settings;
- investing in training more educators on GSCE and ESD across all levels of education;
- exploiting the various GC and SC networks to promote GSCE worldwide (including developing countries);

- prioritising GSC in all efforts to re-shape education in the context of more sustainable economies and societies (collaborating with international programmes such as UNESCO ESD initiatives);
- involving stakeholders such as the private section, academia and civil society in designing new and effective strategies in GSCE;
- enhancing mainstream GSCE in professional training, possibly involving also public-private partnerships.
  (Zuin, Eilks 2019, Zuin et al. 2021)

In other words, future educators need to be well-versed in this growing area of education, and also be well-equipped with an effective pedagogy that enables them to transfer the core principles of sustainability to their target audiences. This may be done in many ways exploiting all possible educational resources, platforms and fora.

Although this may appear to be a tall order, such recommendations stand a good chance of providing new opportunities to achieve further progress in a holistic education that reflects the relentless population explosion and its impact on life including a greater demand for resources and changing scenarios (changing climate, changing planet and a changing society).

Conclusion

In the light of all this and the continuous evolution of socio-educational priorities, educators are therefore urged to prepare students on how to optimize their intellectual potential - rather than celebrate an 'artificial intelligence', and develop into smarter citizens - rather than wizards of 'smarter' devices, by empowering them to practise the art and science of 'green and sustainable chemistry', and by teaching them the tricks of the trade of sustainability… and also how to propagate such principles and apply them in everyday life. Let's lead our next generation to the forefront of a radical educational reform aiming to allow this 'pale blue dot' (Sagan et al. 2017) to shine brighter and evolve into a 'greener' and more habitable planet for its future inhabitants.

References

AKSELA, M., 2016. Education for sustainable development in chemistry teacher education. *LUMAT-B: International Journal on Math, Science and Technology Education*, *1*(3).

ANASTAS, P. T., and BEACH, E. S., 2009. Changing the Course of Chemistry. ACS Publications.

ANASTAS, P. T., and WARNER, J. C., 1998. Principles of green chemistry. Green chemistry: Theory and practice, 29.

ANASTAS, P. T., and ZIMMERMAN, J. B., 2018. The United Nations sustainability goals: How can sustainable chemistry contribute? *Current Opinion in Green and Sustainable Chemistry*, *13*, pp. 150-153.

ÄRLEMALM-HAGSÉR, E., and SANDBERG, A., 2011. Sustainable development in early childhood education: in-service students' comprehension of the concept. *Environmental Education Research*, *17*(2), pp. 187-200.

AUBRECHT, K. B., PADWA, L., SHEN, X., and BAZARGAN, G., 2015. Development and implementation of a series of laboratory field trips for advanced high school students to connect chemistry to sustainability. *Journal of Chemical Education*, *92*(4), pp. 631-637.

AXON, S., and JAMES, D., 2018. The UN Sustainable Development Goals: How can sustainable chemistry contribute? A view from the chemical industry. *Current Opinion in Green and Sustainable Chemistry*, *13*, pp. 140-145.

BALLARD, J., and MOORING, S. R., 2021. Cleaning Our World through Green Chemistry: Introducing High School Students to the Principles of Green Chemistry Using a Case-Based Learning Module. *Journal of Chemical Education*, *98*(4), pp. 1290-1295.

BASTIN, L. D., and DICKS, A. P., 2019. Advances in green chemistry education. *Green Chemistry Letters and Reviews, 12*(2)

BEACH, E. S., CUI, Z., and ANASTAS, P. T., 2009. Green Chemistry: A design framework for sustainability. *Energy & Environmental Science*, *2*(10), pp. 1038-1049.

BOEVE-DE PAUW, J., GERICKE, N., OLSSON, D., and BERGLUND, T., 2015. The effectiveness of education for sustainable development. *Sustainability*, *7*(11), pp. 15693-15717.

BRADLEY, J. D., 2002. New trends in chemistry curricula. A UNESCO-IUPAC (CTC) Workshop. *Chemical Education International, 3*(1), AN-3.

BRAUN, B., CHARNEY, R., CLARENS, A., FARRUGIA, J., KITCHENS, C., LISOWSKI, C., NAISTAT, D, and O'NEILL, A., 2006. Completing our education - green chemistry in the curriculum. *Journal of Chemical Education, 83*(8), pp. 1126-1129.

BRUNDTLAND, G. H., 1987. What is sustainable development. *Our common future*, *8*(9).

BURMEISTER, M., RAUCH, F., and EILKS, I., 2012. Education for Sustainable Development (ESD) and chemistry education. *Chemistry Education Research and Practice*, *13*(2), pp. 59-68.

BURMEISTER, M., SCHMIDT-JACOB, S., and EILKS, I., 2013. German chemistry teachers' understanding of sustainability and education for sustainable development—An interview case study. *Chemistry Education Research and Practice*, *14*(2), pp. 169-176.

CANN, M. C., 2001. Greening the Chemistry Curriculum at the University of Scranton. *Green Chemistry, 3*(2), G23-G25.

CARRA, J., 1999. International diffusion of sustainable chemistry. In *Proceedings of the OECD workshop on sustainable chemistry - Part 1-Venice, 15-17 October 1998*.

CARSON, R., 1962. Silent spring. Reprinted in Penguin Classics 2000.

CHEN, M., JERONEN, E., and WANG, A., 2020. What lies behind teaching and learning green chemistry to promote sustainability education? A literature review. *International Journal of Environmental Research and Public Health*, 17(21), p. 7876.

CHEUNG, P., 2020. Teachers as role models for physical activity: Are preschool children more active when their teachers are active? *European Physical Education Review*, *26*(1), pp. 101-110.

CLARK, W. C., ANASTAS, P. T., ZIMMERMAN, J. B., and MATUS, K. J. M., 2012. *Barriers to the implementation of green chemistry in the United States* (No. 9639957).

Council on Foreign Relations, 2020. Ecological Disasters: 1912-2020. https://www.cfr.org/timeline/ecological-disasters. Accessed 1 August 2021.

DESA, U.N., 2016. Transforming our world: The 2030 agenda for sustainable development.

DOXSEE K.M., and HUTCHISON, J.E., 2003. *Green Organic Chemistry: Strategies, Tools & Laboratory Experiments.* Belmont, CA: Thomson Brooks/Cole.

DU PISANI, J. A., 2006. Sustainable development–historical roots of the concept. *Environmental sciences*, *3*(2), pp. 83-96.

FENECH CARUANA, M., 2015. *Greening the chemistry curriculum in Maltese educational institutions: the reaction of pre-university students to the introduction of green chemistry. A case study from Malta* (Doctoral dissertation, University of York).

FENECH CARUANA, M., 2018. Highlighting the green face of chemistry to sixth-form students. *Symposia Melitensia 14,* pp. 271-282.

FUKUDA-PARR, S., 2004. Millennium Development Goals: why they matter. *Global Governance*, *10*, p. 395.

GOES, L. F., LEAL, S.H., CORIO, P., and FERNANDEZ, C., 2013. Pedagogical Content Knowledge Aspects of Green Chemistry of Organic Chemistry University Teachers. In C.P. Constantinou, N. Papapdouris, A. Hadgigeorgiou (Ed.), *Ebook Proceedings of the ESERA 2013 Conference: Science Education Research for Evidence-based Teaching and Coherence in Learning.*: European Science Education Research Association.

Green Chemistry Institute, American Chemical Society, ACS. 2021a. Green Chemistry Education Resources. https://www.acs.org/content/acs/en/greenchemistry/students-educators/online-educational-resources.html. Accessed 1 August 2021.

Green Chemistry Institute, American Chemical Society, ACS, 2021b. Green Chemistry Education Roadmap. https://www.acs.org/content/acs/en/greenchemistry/students-educators/education-roadmap.html. Accessed 1 August 2021.

HAACK, J. A., and HUTCHISON, J. E., 2016. Green Chemistry Education: 25 Years of Progress and 25 Years Ahead. *ACS Sustainable Chemistry, 4*(11)*,* pp. 5889-5996

HAACK, J. A., HUTCHINSON, J.E., KIRCHHOFF, M.M., and Levy, I.J., 2005. Going green: lecture assignments and lab experiences for the college curriculum. *Journal of Chemical Education, 82*(7)*,* pp. 974-978.

HARRISON, E., SMITH, H., and DEKKER, I., 2021. Designing & Facilitating a Bioeconomy in the Capital Regional District. https://www.researchgate.net/profile/Isaac-Dekker/publication/351060324_Designing_Facilitating_a_Bioeconomy_in_the_Capital_Regional_District_Learning_Through_the_Lenses_of_Biomimicry_Industrial_Symbiosis_and_Green_Chemistry/links/6096ec4d92851c490fc74d43/Designing-Facilitating-a-Bioeconomy-in-the-Capital-Regional-District-Learning-Through-the-Lenses-of-Biomimicry-Industrial-Symbiosis-and-Green-Chemistry.pdf. Accessed 1 August 2022

HILL, J., KUMAR, D.D., and VERMA R.K., 2013. Challenges for chemical education: engaging with green chemistry and environmental sustainability. *The Chemist - Journal of the American Institute of Chemists, 86*(1), pp. 24-31.

HOGUE, C., 2019. Differentiating green chemistry from sustainable chemistry. *Chemical & Engineering News*, *97*(31), p. 19. https://cen.acs.org/environment/green-chemistry/Differentiating-between-green-chemistry-sustainable/97/web/2019/07. Accessed 1 August 2021.

HOPKINS, C., 2012. Twenty years of education for sustainable development. *Journal of Education for Sustainable Development 6,* pp. 1-4.

HUTZINGER, O., 1999. The greening of chemistry. Is it sustainable? *Environmental Science & Pollution Research, 6*(3), p. 123.

JEGSTAD, K. M., and SINNES, A. T., 2015. Chemistry teaching for the future: A model for secondary chemistry education for sustainable development. *International Journal of Science Education*, *37*(4), pp. 655-683.

JUNTUNEN, M. K., and AKSELA, M. K., 2014. Education for sustainable development in chemistry–challenges, possibilities and pedagogical models in Finland and elsewhere. *Chemistry Education Research and Practice*, *15*(4), pp. 488-500.

KANAPATHY, S., LEE, K. E., MOKHTAR, M., ZAKARIA, S. Z. S., SIVAPALAN, S., and ZAHIDI, A. M., 2019. Sustainable chemistry teaching at the pre-university level: Barriers and opportunities for university educators. International Journal of Sustainability in Higher Education.

KANAPATHY, S., LEE, K. E., MOKHTAR, M., ZAKARIA, S. Z. S., SIVAPALAN, S., and ZAHIDI, A. M., 2017. The integration of sustainable development concept in Chemistry curriculum: a conceptual framework for the case of Pusat PERMAT Apintar™ Negara. In *2017 - 7th World Engineering Education Forum (WEEF)* (pp. 303-308). IEEE.

KANEDA, T., GREENBAUM, C., and KLINE, K., 2020. World Population Data Sheet. *Population Reference Bureau.* http://sdg.iisd.org/news/world-population-to-reach-9-9-billion-by-2050/. Accessed 1 August 2021.

KARPUDEWAN, M., ISMAIL, Z. H., and MOHAMED, N., 2011. Green chemistry: Educating prospective science teachers in education for sustainable development at school of educational studies, USM. *Journal of Social Sciences*, *7*(1), p. 42.

KARPUDEWAN, M., ROTH, W. M., and ISMAIL, Z., 2015. The effects of "Green Chemistry" on secondary school students' understanding and motivation. *The Asia-Pacific Education Researcher*, *24*(1), pp. 35-43.

KIOUPI, V., and VOULVOULIS, N., 2019. Education for sustainable development: A systemic framework for connecting the SDGs to educational outcomes. *Sustainability*, *11*(21), 6104.

KIRCHHOFF, M., 2014. The chemistry is always greener. http://www.acs.org/content/acs/en/education/students/graduate/the-chemistry-is-always-greener.html. Accessed 1 August 2021.

KOPNINA, H., 2012. Education for sustainable development (ESD): the turn away from 'environment' in environmental education? *Environmental Education Research*, *18*(5), pp. 699-717.

LINKWITZ, M., and EILKS, I., 2019. Green Chemistry in School: Lessons and Experiments on Sustainability. *Chemistry in Our Time*, *53*(6), pp. 412-420.

LINKWITZ, M., BELOVA, N., and EILKS, I., 2021. Teaching about green and sustainable chemistry already in lower secondary chemistry education? - The project "Cosmetics go green". *CHEMKON*, *28*(4), pp. 155-161.

LINTHORST, J. A., 2010. An overview: origins and development of green chemistry. *Foundations of chemistry*, *12*(1), pp. 55-68.

MACKELLAR, J. J., CONSTABLE, D. J., KIRCHHOFF, M. M., HUTCHISON, J. E., and BECKMAN, E., 2020. Toward a green and sustainable chemistry education road map. *Journal of Chemical Education*, *97*(8), pp. 2104-2113.

MANDERY, H., 2013. *Speech by Hubert Mandery, Director General of CEFIC. Presented at ECOCHEM - the Sustainable Chemistry & Engineering Event*. http://www.cefic.org/newsroom/Speeches/Speech-Herbert-Mandery-at-2013-Ecochem/. Accessed 1 August 2021.

MANDLER, D., MAMLOK-NAAMAN, R., BLONDER, R., YAYON, M. and HOFSTEIN, A., 2012. High-school chemistry teaching through environmentally oriented curricula. *Chemistry Education Research & Practice, 13*(2), pp. 80-92.

MATUS, K. J., CLARK, W. C., ANASTAS, P. T., and ZIMMERMAN, J. B., 2012. Barriers to the implementation of green chemistry in the United States. *Environmental science & technology*, *46*(20), pp. 10892-10899.

MCKEOWN, R., and HOPKINS, C., 2005. EE and ESD: Two paradigms, one crucial goal. *Applied Environmental Education and Communication*, *4*(3), pp. 221-224.

MERKEL, A., 1998. The role of science in sustainable development. *Science*, *281*(5375), pp. 336-337.

MIDDLECAMP, C. H., 2019. Sustainability in the chemistry curriculum: a call for action. *Israel Journal of Chemistry*, *59*(6-7), pp. 504-513.

MUÑOZ ORTIZ, I., 2006. *Life cycle assessment as a tool for green chemistry application to different advanced oxidation processes for wastewater treatment*. Universitat Autònoma de Barcelona.

PAVEZ, P., HONORES, J., MILLÁN, D., and ISAACS, M., 2018. UN sustainable development goals: How can sustainable/green chemistry contribute? *Current Opinion in Green and Sustainable Chemistry*, *13*, pp. 154-157.

PAXTON, L., 1993. Enviro Facts 3: sustainable development. *Howick, South Africa: Environmental Education Association of Southern Africa*.

POLIAKOFF, M., LICENCE, P., and GEORGE, M. W., 2018. UN sustainable development goals: How can sustainable/green chemistry contribute? By doing things differently. *Current Opinion in Green and Sustainable Chemistry*, *13*, pp. 146-149.

RAUCH, F., 2015. Education for sustainable development and chemistry education. *Worldwide trends in green chemistry education*, pp. 16-26.

RAVICHANDRAN, S., 2011. Perspective and fate of green chemistry. International Journal of ChemTech Research, *3*(4), pp. 1882-1885.

Royal Society of Chemistry, RSC, 2021. Inspirational chemistry: sustainable development and green chemistry. https://edu.rsc.org/resources/sustainable-development-and-green-chemistry/1935.article. Accessed 1 August 2021.

ROBINSON, J., 2004. Squaring the circle? Some thoughts on the idea of sustainable development. *Ecological economics*, *48*(4), pp. 369-384.

SAGAN, C., SAGAN, C. and DRUYAN, A., 2017. *Pale, Blue Dot: A Vision of the Human Future in Space*. Brilliance Audio.

SANDERSON, K., 2011. Chemistry: It's not easy being green. Nature News, 469(7328), pp. 18-20.

SAVITSKAYA, T., KIMLENKA, I. and RYTAU, A., 2012. The Greening of the Chemistry Curriculum: International Cooperation "Belarus - V4 Countries". In *Abstract Book of 22nd International Conference on Chemistry Education (ICCE) & 11th European Conference on Research in Chemistry Education (ECRIICE) "Stimulating Reflection & Catalysing Change in Chemistry Education" - 15-20 July 2012 - Rome, Italy*.

The World Energy Foundation, 2014. A brief history of sustainability. https://theworldenergyfoundation.org/a-brief-history-of-sustainability/. Accessed 1 August 2021.

TIMMER, B. J., SCHAUFELBERGER, F., HAMMARBERG, D., FRANZÉN, J., RAMSTRÖM, O. and DINÉR, P., 2018. Simple and effective integration of green chemistry and sustainability education into an existing organic chemistry course. *Journal of Chemical Education*, *95*(8), pp. 1301-1306.

TUNDO, P., 2008. *First meeting of the working party on green and sustainable chemistry*. http://www.euchems.org/binaries/1stWPGreenandSus28Feb08_tcm23-127739.pdf. Accessed 1 August 2021.

TUNDO, P., 2012. Preface (to special topic issue devoted to green chemistry). *Pure & Applied Chemistry, 84*(3), vi.

U.S. Census Bureau, 2016. World Population 1950-2050. https://www.census.gov/library/visualizations/2011/demo/world-population--1950-2050.html. Accessed 1 August 2021.

UNESCO, 2020. Education for Sustainable Development – a Roadmap. https://www.gcedclearinghouse.org/sites/default/files/resources/200782eng.pdf. Accessed 1 August 2021.

UNESCO, 2021a. Education for Sustainable Development. https://en.unesco.org/themes/education-sustainable-development. Accessed 1 August 2021.

UNESCO, 2021b. UN Decade of Education for Sustainable Development. https://en.unesco.org/themes/education-sustainable-development/what-is-esd/un-decade-of-esd. Accessed 1 August 2021.

University of Minnesota, Department of Chemistry, 2021. Environmental and Green Chemistry. https://cse.umn.edu/chem/environmental-green. Accessed 1 August 2021.

University of Toledo, School of Green Chemistry & Engineering, 2021. Undergraduate Program. https://www.utoledo.edu/nsm/sgce/undergraduateprograms.html. Accessed 1 August 2021.

VAN ROON, A., GOVERS, H. A., JOHN, R., and VAN WEENEN, H., 2001. Sustainable chemistry: an analysis of the concept and its integration in education. *International Journal of Sustainability in Higher Education*.

VIEDERMAN, S., 1993. Sustainable development: what is it and how do we get there? *Current History*, *92*(573), p. 180.

VILCHES, A. and GIL-PEREZ, D., 2013. Creating a sustainable future: some philosophical and educational considerations for chemistry teaching. *Science & Education, 22(*7), pp. 1857-1872.

WAKED, A.E., DEMMANS, K.Z., HEMS, R.F., REYES, L.M., MALLOV, I., DALEY, E., HOCH, L.B., MASTRONARDI, M.L., DE LA FRANIER, B.J., BORDUAS-DEDEKIND, N. and DICKS, A.P., 2019. The Green Chemistry Initiative's contributions to education at the University of Toronto and beyond. *Green Chemistry Letters and Reviews*, *12*(2), pp. 187-195.

WARDENCHI, W., CURYLO, J. and NAMIESNIK, J., 2005. Green Chemistry: Current and Future Issues. *Polish Journal of Environmental Studies, 14*(4), pp. 389-395.

WARE, S. A., 2001. Teaching chemistry from a societal perspective. *Pure and applied chemistry*, *73*(7), pp. 1209-1214.

WCED U.N., Special Working Session, 1987. World commission on environment and development. *Our common future*, *17*(1), pp. 1-91.

WESSELINK, R., & WALS, A. E., 2011. Developing competence profiles for educators in environmental education organisations in the Netherlands. *Environmental Education Research*, *17*(1), pp. 69-90.

WORLD Health Organization, WHO, 2005. *Health and the millennium development goals*. World Health Organization.

Worldometers, 2022. https://www.worldometers.info/world-population/. Accessed 26 October 2022.

ZUIN, V. G., EILKS, I., ELSCHAMI, M., & KÜMMERER, K., 2021. Education in green chemistry and in sustainable chemistry: perspectives towards sustainability. *Green Chemistry*, *23*(4), pp. 1594-1608.

ZUIN, V., & EILKS, I., 2019. Green and Sustainable Chemistry Education: Nurturing a New Generation of Chemists-Foundation Paper for GCO II Part IV.

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Reaching and Teaching Students from Ethnic Minorities in a Maltese State School

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Abstract

One of the objectives of educational institutions is to transmit positive values and skills to all students, irrespective of their background. As often outlined by research, students from ethnic minorities tend to experience marginalisation, an issue that can potentially be removed by schools and educators through multicultural education. This qualitative research sought to understand the perspectives of educators working in a particular Maltese secondary state school about the inclusion of students from ethnic minorities. It delved into the educators' positionality, knowledge and skills, and into the provisions available to them to holistically reach students from ethnic minorities in their classrooms. Following semi-structured interviews with seven educators (teachers, Learning Support Educators and members of the School Leadership Team), a thematic analysis was employed to identify the factors that affect the holistic inclusion of students from ethnic minorities. This research brought forward the educators' positive outlook toward the inclusion of these students. It also highlighted their will to become more culturally competent in addressing the students' holistic needs. Distinct barriers were also pointed out, such as language, behaviour and the provision of basic needs. Finally, the researchers sought to derive potential solutions that could advance and sustain the holistic inclusion of these students in this particular school, and which could be used as potential reflections for the holistic inclusion of students from migrant backgrounds in Maltese schools. Considering the evidence of the pivotal role of educators in kick-starting the process for a genuine education that includes all students, the right support and mechanisms need to be set up to complete the beautiful kaleidoscope of multicultural education.

Keywords: *educational barriers; ethnic minorities; inclusive education; Maltese schools; multicultural education*

Introduction

Being a small country in the Mediterranean, Malta's history has been mostly related to emigration for decades as Maltese nationals moved to Canada, Australia, and the United Kingdom due to overpopulation and unemployment after the Second

World War (Baldacchino, Briffa 2020). During the last two decades, however, Malta has shifted into a country of immigration. Despite being the smallest member state, Malta is currently the most heavily populated country in the European Union (EU). Malta's immigrants are mainly third-country nationals (TCN) seeking asylum due to war and persecution and European citizens who practise their privilege of free movement due to Malta's membership in the EU (National Statistics Office 2021).

The Context of the Study

Malta's shift with immigration is highly represented in Maltese state schools by a vast heterogeneity in student population encompassing many learners considered TCN. These students are mainly from Africa and Asia (United Nations High Commissioner for Refugees 2021). Since Maltese state college networks host their students according to their residential locality, an imbalanced distribution of TCN in Maltese state schools has been noted (Fenech, Seguna 2020).

The Migrant Learners' Unit (MLU) aims at bridging the initial gaps in the integration of new migrant learners in Maltese schools, with sociocultural and basic language skills that can facilitate their inclusion and academic attainment (Farrugia et al. 2020, Vassallo Gauci 2018). However, these students still end up as ethnic minorities in schools where the majority look different, do not speak their language, and do not understand their backgrounds or cater for their cultural needs (Gorski 2020). This qualitative research highlights the perspectives of seven educators on the inclusion of students from ethnic minorities in a particular Maltese secondary state school.

The Relevance of the Study

The main goal of educational institutions is to teach and include all students irrespective of their diversity and shows that a good education helps students discover their worth. It gives students the required skills to become responsible and contributing citizens who function to their best possible potential (MEDE 2019). Being a form of socialisation agency, schools act as nuclei that transmit values and shape children (Premazzi 2020). Besides being safe spaces where all children learn together, schools should be the places where anxieties about the unknown are subdued and possibly abolished, with positive experiences that foster confidence, empathy and celebration of diversity (Gay 2018, Landsman, Lewis 2011).

Education that works successfully leaves no learner behind and it does not stop at placement or tolerance (Darmanin 2013). Inclusive education nurtures a sense of belonging. It values and gives equal opportunities to everyone in a learning community that collaborates, and shares experiences and knowledge (Premazzi 2020, Wright 2020). Such education aims at creating a peaceful world of equity and

social justice, where everyone can live together without prejudice and discrimination (UNESCO 2014, UNESCO 2019).

Multicultural education is equivalent to an inclusive education that promotes access and enjoyment of learning for everyone (Nieto 1999). Consequently, current policies and frameworks (MEDE 2019) advocate multiculturalism and any form of diversity as components that mirror inclusive education. Considering that imperilling the education of learners from a migrant background can have a severe global effect, safeguarding the inclusion of students from ethnic minorities should be considered a priority to counteract Malta's brain drain (UNESCO 2014, UNESCO 2019). Moreover, the integration and quality of life of TCN and refugees have also been highlighted as factors that facilitate sustainable development goals (Bezzina 2020).

Despite the above-mentioned benefits of diversity and multiculturalism in schools, local research suggests that students from ethnic minorities are still facing many hardships related to marginalisation (Caruana, Francalanza 2013, Cefai et al. 2019), invisibility, and assimilation (Caruana et al. 2013, Debono 2020, Scicluna 2013). Lack of educator preparedness and poor cultural responsiveness have also been pointed out as the main barriers preventing the holistic support and inclusion of many students, particularly those from ethnic minorities. Besides leading to a high degree of otherness, such issues are causing academic and other discrepancies between students from ethnic minorities and their same-aged peers (Ariza et al. 2019, Attard Tonna et al. 2017, Darmanin 2013, Debono 2020). Such findings go against the notion of inclusive practices mentioned in national and EU documents such as A Policy on Inclusive Education in Schools (MEDE 2019) and Key Competences for Lifelong Learning (European Commission 2019).

The need to move beyond mere placement with educator training has often been highlighted (Calleja et al. 2010, Caruana, Francalanza 2013, Darmanin 2013). Culture, language, and religion can act as barriers that hinder students from ethnic minorities from fully achieving the benefits of schooling. However, it has long been suggested that schools that do not adequately respond to students' diversity are the main barriers, and educators have the utmost potential to remove them (Banks 2013, Nieto 2015). Despite educators' favourable position to catalyse the holistic inclusion of diverse students, it has often been noted that a positive shift can only be founded with the correct support mechanisms (Banks 2013, Caruana, Francalanza 2013, Gorski 2018).

The Aims and Objectives of the Study

This research aimed to determine whether a group of educators in a particular Maltese secondary state school has the required positionality, knowledge, skills and provisions to holistically support students from ethnic minorities. It hoped to raise awareness and stir reflections so that Maltese schools, based on the findings

from this particular school, become better equipped to respond to diversity, not merely as a means of interest convergence (Bell et al. 2005) but as an act of respect towards humanity. The following research questions served to facilitate the aims and objectives of this research:

- What are the lived experiences of educators working in a particular Maltese secondary state school about the inclusion of students from ethnic minorities?
- What are these educators' perspectives on the barriers that may hinder the holistic inclusion of students from ethnic minorities in this particular Maltese secondary school?
- What are these educators' perspectives about potential solutions to facilitate the full inclusion of students from ethnic minorities in this particular Maltese secondary school?

Literature review

Diversity, Inclusion, and Multicultural Education in Malta

Migration has long been considered as the only ray of hope by many. Such a notion has led it to continue over the years (De Haas et al. 2020). Although Malta hosted immigrant communities during various periods, an integration policy was only enacted in 2017. While multilingualism has always been a prominent feature of Europe countries, cultural diversity has not yet been fully acknowledged (Caruana et al. 2013, Chin 2019). Being the smallest member state in the EU, the current influx of irregular immigrants and asylum seekers and the idea of Malta becoming a permanent host for a diverse range of communities has raised many questions about diversity and inclusion (Calleja et al. 2010).

The aforementioned increase in diversity is being reproduced in Maltese state schools, with several students standing out as ethnic minorities from Africa and Asia (NSO 2021). Since educational institutions act as the first socialisation and intercultural communication context for foreign children (Klein 2010), Maltese policies have emphasised educators' decisive role in fulfilling the holistic needs of diverse students (MEDE 2012, MEDE 2014a, MEDE 2014b, MEDE 2019). Such responsibility has introduced educators to countless challenges for which they have never been adequately and proactively prepared (Caruana et al. 2013).

Multicultural education is based on the civil rights movement (Banks 2019) and it has the specific target of teaching all students the skills required to function effectively in a pluralistic and multicultural society with democracy and fairness. Multicultural education is a "societal platform" and an "educational philosophy" that transmits the recognition and appreciation of people's differences (Vang 2010 p.8). It aims to advocate for those who are excluded or least acknowledged.

Duby (1996) pointed out that meaningful education can foster bright and peaceful futures through acceptance, collaboration and the celebration of diversity. The inclusion of ethnic minorities and multicultural education have also been referenced as means to reach sustainable development goals (Bezzina 2020) and abolish the brain drain in Malta and other countries (UNESCO 2014, UNESCO 2019).

Barriers to Multicultural Education and Inclusion

Multicultural education is far from a straightforward matter and is considerably challenging to address in a holistic manner (Banks 2017). It has evolved over the years and moved from black/white issues to a broader ideology where all diverse individuals learn and live together. The topic became the chosen area of interest by researchers recently, when the requests for asylum started increasing from people coming from North Africa. Such reflects how the contexts of multiculturalism have changed in Malta (Spiteri 2016).

Contrary to European countries like Germany and the Netherlands, Malta is hosting many ethnic variations. As a result, the inclusion of students considered TCN is perceived as a highly challenging issue (Cilia 2012). As students' ethnicity, language, and culture differ more and more from educators', doubts and fears are bound to arise. Lack of understanding about cultural diversity, the absence of knowledge and awareness of privilege, politics, power, and other misconceptions can impede the success and benefits of multicultural education (Ambrosio 2003, Gorski 2018, Nieto 2018).

Multicultural teaching skills are acquired with time during which educators' personal and professional aptitudes improve with self-awareness and cultural competence (Banks, McGee Banks 2016, Moodley 2021, Sleeter 2010). Recent studies revealed that educators are prone to a reactive approach when dealing with multiculturalism issues in Maltese schools (Ariza et al. 2019, Debono 2020). Such factors can lead students from ethnic minorities to experience uncertainties and fears that negatively impact their sense of belonging and inclusion (Gorski 2020). Besides putting individual students at risk, jeopardising the educational needs of migrant learners is a global issue (Ariza et al. 2019, UNESCO 2014, UNESCO 2019). With this perspective, educators need guidance and support in dealing with the current reality that is notably present in many Maltese schools (Caruana, Francalanza 2013).

Catalysing the Inclusion of Ethnic Minorities

Changes in educational systems are often challenging and slow (Gorski 2020). Overcoming ethnocentric and Eurocentric ideologies requires cultural responsiveness

(Spiteri 2016). Since schools can be considered microcosms of society (Bhattacharya 2006), educators and school leaders have the power and obligation to guide the whole school community towards inclusion and cultural responsiveness.

A good enough educator can catalyse the inclusion of students from ethnic minorities in mainstream schools (Banks, McGee Banks 1995, Gay 2003, Schembri 2020). While Gorski (2018, p.121) highlighted that the shortcomings of policies reflect an "illusion of concern", he added that educators who are determined and willing could be catalysts for solidifying the "illusion of equity". With suitable mechanisms and provisions, educators who have adequate positionality, knowledge, and skills (Banks 2015, Gay 2003) could become mediators who make the transition from policy to practice possible (Cooper et al. 2011). Inclusive attitudes from educators empower and nurture marginalised students, strengthen their characters, and make them more apt at functioning successfully in the complex and pluralistic society we live in (Brown 2020).

Becoming multicultural individuals entails a developmental journey of knowledge of ethnicity, diverse cultures, and confrontation with one's own deepest and sometimes even unconscious prejudice and intolerance. It requires an individual to become actively and effectively involved in the process of learning, understanding, sharing, reflecting, and analysing various aspects of the self and others, society and politics (Jackson 2003). This requires willingness and open-mindedness (Hollie 2018) to understand the various factors that may cause inequity and injustice in society, even in subtle unconscious manners (Gay 2018, Nieto 2018, Sleeter 2013). These may include but are not limited to white privilege, aversive racism, and colour blindness (Delgado, Stefancic 2012). This process facilitates educators' perspectives, awareness, and responsiveness to bring about the necessary shift to overcome the challenges acknowledged in policies that exist tenfold in practice and catalyse change in and outside the classroom.

Multicultural educators understand the necessity to design pedagogies of belonging that engage and benefit all students. Such educators possess the ideological clarity that makes them capable of judging knowledge in terms of the socio-political aspect of everyday life. They know that the essence of learning is not only relative to the kind of information we impart but to how students process and evaluate that information and experience (May, Sleeter 2010).

Banks (2019) promotes multicultural education as an instrument that helps develop an awareness of the various hierarchies that dominate today's society. To portray his ideology, Banks subdivided multicultural education into five dimensions that are "content integration", "the knowledge construction process", "prejudice reduction", "equity pedagogy", and "an empowering school culture and social structure" (Banks, McGee Banks 2016, p.16). These dimensions suggest that besides addressing the academic curriculum, educators also need to acquire knowledge about their students' diverse cultures, perceptions, and histories. Such entails that educators do not limit themselves to including multicultural content and knowledge

about diverse cultures in their teaching, as is the frequent misconception of multicultural education (Banks, McGee Banks 1995), but a holistic approach that promotes reflective and critical thinking skills and the fairness and equity that will ultimately bring about the holistic inclusion of all diverse students.

Implementing these dimensions entails moving from the banking model of education to a more critical aspect of teaching and learning, with a pedagogy that empowers students as active agents in the learning process and equips them with the knowledge and qualities that can deconstruct racism and concepts of power by challenging the existing normalised incongruencies (Freire, Shor 1987, Sleeter, Carmona 2017). Such methodology would aim at closing achievement gaps (Muhammad 2015, Sleeter, Carmona 2017) that are the consequence of a series of issues related to health and social discrepancies and experiences (Howard 2019).

Considering that societies do not have the innate disposition to teach heterogeneous populations or deal with the challenges related to diversity and equity (Sleeter, Carmona 2017) educators who want to be active agents in transforming education need to raise their expectations of students (Gorski 2018, Muhammad 2015, Nieto 2015). With the notion that curriculum greatly influences knowledge and thoughts about life, culturally responsive pedagogy is a prerequisite to multicultural education (Bezzina 2020, Gay 2018, Nieto 2001).

Banks (2017) posed questions about the degree to which educators can teach in a culturally responsive manner with the intrusion of standardised testing. Other than subject content, curricula need to provide students with realities, perspectives, and experiences (Sleeter, Carmona 2017). Inclusive education needs active policies, with educators that are readily willing to become anti-racist scholars (Scheurich 2012) who do not shy away from promoting diversity as a beautiful kaleidoscope of cultures, religions, experiences, abilities, and other human differences. Although the Maltese curriculum has evolved to accommodate students' diverse academic, social, and emotional needs (Cefai 2020), more needs to be done to reach and include students from ethnic minorities (Attard Tonna et al. 2017, Cilia 2012, Darmanin 2013), and educators can be smart enough to do it right.

Methodology

The Research Design

Qualitative methodology was chosen to enhance this research with diverse and even contrasting findings (Braun, Clarke 2013). The researchers compiled three research questions :What are the lived experiences of educators working in a particular Maltese secondary state school about the inclusion of students from ethnic minorities? What are these educators' perspectives on the barriers that may hinder the holistic inclusion of students from ethnic minorities in this particular

Maltese secondary school? What are these educators' perspectives about potential solutions to facilitate the full inclusion of students from ethnic minorities in this particular Maltese secondary school? To analyse situations, attitudes, ideologies and suggestions related to the inclusion of students from ethnic minorities in a particular Maltese secondary state school. By taking a constructivist approach to derive meaning from educators' lived experiences and perspectives, the researchers hoped that this study would be transformative by improving the lives of marginalised groups and victims of oppression (Creswell, Creswell 2018). Semi-structured interviews were conducted with seven educators who teach in a particular state school in Malta. Considering that educators may be affected by misconceptions about multiculturalism, a qualitative approach could promote coherence (Ponterotto 2010) and give the study the potential to act as a changing agent (Schembri, Sciberras 2022), in a small island state such as Malta (Schembri, Sciberras 2020).

Sampling and Data Collection

Once the Ethics Board at the education institution where this research was carried out and the MFED Research Ethics Committee (MREC) approved this research, a detailed email was sent to the Head of School. Considering that the latter was the gatekeeper in this research, the approval and assistance of the Head of School were necessary for the study to take place in this particular school and to conform to an ethical recruitment process. Recruitment of participants took place by word of mouth and nomination. In line with Creswell and Poth (2018), purposeful snowball sampling satisfied the researchers' need for an in-depth analysis of educators' perspectives about their experience in the inclusion of students from ethnic minorities in this secondary school.

Seven educators participated in the study; namely three teachers, two LSEs, and two SLT members working in a secondary state school that hosts a percentage of students from diverse backgrounds of culture, religion, and nationality. This sample was chosen to reflect the ratio of teachers to LSEs in the school and give the researchers a clearer view of the particular context (Creswell, Poth 2018). All participants have been working in an educational setting for over ten years. The latter was critical to the researchers since experienced participants could better depict their experience with the shift that has occurred over the years with the inclusion of students from ethnic minorities in Maltese schools. Moreover, the qualifications of interviewees were also vital in ruling out any potential lack of training opportunities. The sample was also chosen to offer a triangulation of participants and eventually triangulation of data; eliciting the perspectives of three stakeholders within this particular research setting would offer multiple viewpoints to the issues being discussed.

Research Instrument: Semi-structured Interviews

Semi-structured interviews were used as the data collection instrument as this method allowed participants to open up and share concerns and made the researchers aware of any unanticipated aspect of the topic by evoking discussion. The interview guides were available in Maltese and English to facilitate the participants' ease during the interview, and participants were free to answer questions according to their preference. Besides demographic information, the preliminary questions of the interview included two (optional) questions about the participants' religious and political views since these could influence their perspectives. Following, four interview questions were tied to each research question, totalling twelve questions. The first four questions sought to bring out educators' personal and professional views about diversity, multiculturalism, and multicultural education. The following four were related to the barriers encountered by educators, and the final questions targeted potential changes that could facilitate the holistic inclusion of students from ethnic minorities in this particular Maltese secondary state school.

Limitations and Strengths of the Methodology

The semi-structured interviews gave the researchers access to the participants' experiences, feelings, concerns, interpretations, and suggestions. The use of Microsoft Teams® permitted the synchronism of interviews (Fielding et al. 2017) and compensated for the social distance issues related to the COVID-19 pandemic. Since the environment plays a vital role in interviews, online interviews may have made the participants more at ease for the simple reason of being comfortable in their home environment.

Although the visual aspect of the interviews permitted the researchers to view the participants' body language and facial expressions, such could have also led to misinterpretations (Keegan 2009). Another limitation could be related to the sample size which cannot provide a generic view of the situation (Braun, Clarke 2013) although this was not the aim of the study.

Findings

Data analysis took place in thematic form. Nine themes were brought out, as the perspectives of two SLT members (S1, S2), two LSEs (L1, L2) and three teachers (T1, T2, T3) were analysed in line with the three research questions.

1. Educators' View of Students from Ethnic Minorities

The Number Novelty

The number novelty for which Malta has never been prepared emerged from the start. The influx of immigrants was referred to as a *phenomenon* (L1) that has brought *many challenges* (T2). As outlined by Ambrosio (2003), Nieto (2018), and Gorski (2018), the stigma associated with TCN became immediately evident as a possible factor leading to fear, discrepancy and detachment which can impinge the success of multicultural education. The distribution and concentration of ethnic minorities in certain areas around Malta were also noted.

> *I believe we are afraid of change* (T2).

> *When you see the number of migrants entering Malta, the demography... Certain areas have become off-limits for Maltese people* (S1).

Such findings are congruent with the uncertainties elicited by the influx of diversity in Malta pointed out by Calleja et al. (2010). As specified by Caruana et al. (2013), a lack of direct experiences with people of different cultures, together with the sudden novelty of large numbers, can lead people to "feel threatened" (p.18). The imbalanced distribution of migrants in particular Maltese towns and villages pinpointed by Fenech and Seguna (2020) was communicated as one that could lead to segregated groups and possible behaviour issues. It was also implied as a determining factor in the support provided to these students.

> *Colleges that host large quantities end up with close-knit gangs, which can cause trouble…* (S1)

> *We do not have many, so it is much easier for us to give them individual attention and help them.* (S1)

> *It all boils down to numbers* (S1).

While participants specified having no issues with immigrants *as long as they are good citizens* (T3), one may wonder whether any issues related to conduct could be a form of aversive racism, as indicated by Delgado and Stefancic (2012), Sleeter (1993), Marx and Pennington (2003), and Darmanin (2013). The portrayal of violent incidents on social media could also be a potential instigator of fear.

> *We have seen videos on social media where they have referred to taking over the country* (S1).

> *That bothers and worries me, so I get these mixed feelings* (S1).

Cultural Exposure

Supporting UNESCO's view of multicultural education (2019) as a means for peace and equity, educators identified cultural exposure as a way that broadens horizons.

> *It is a gold mine that gives first-hand experience of other people's cultures* (T1).

Even more positive was the finding that, rather than being a result of interest convergence (Bell et al. 2005, Delgado, Stefancic 2012), the inclusion of students from ethnic minorities in the school was defined as something that could be decisive in the elimination of misconceptions and fears and bring peace to the world.

> *It is a blessing, a ray of hope*, *a very positive thing for tomorrow's youths*. *It transmits acceptance and open-mindedness (S1).*
>
> *Multicultural education can teach students how to help another person (L1)*.
>
> *The world belongs to everyone, not to one individual, or one population, or race (S2).*
>
> *Despite our differences, as humans, we are also similar (S2).*
>
> *Youths can be more tolerant as they get to know the people they are socialising with, in contrast to adults who may have ingrained ideas (S2).*
>
> *Perhaps the new generations will not fear those who are different (T2).*

As confirmed by Gay (2003), Nieto (1999), and Gorski (2018), positivity to diversity in schools can eliminate many hurdles. In line with Gay, (2018) and Landsman and Lewis (2011), the need for more cultural exposure was noted. Educators suggested including *halal burgers* in the tuckshop, collaborative learning, celebration of various feasts, and parental involvement. In contrast to Debono (2020) and Scicluna (2013), assimilation was referred to as *disastrous* (T1) and the preservation of cultural and religious identity was highlighted.

> *I do not expect someone to become Roman Catholic from Muslim or vice versa* (T3).

These novel ideas proposed by the interviewees may be taken up by this particular school and may also be welcomed in other secondary schools in Malta.

Educating for Diversity

The will to transmit a sense of belonging to students from ethnic minorities was conspicuous. All participants referred to giving the same opportunities to learn and develop through technology, good communication, group work and sharing of experiences as key to facilitating a sense of belonging. These findings support the cultivation and stimulation of meaningful contact between diverse students as a means that facilitates inclusion as suggested by Debono (2020).

> *You try to attract them as you would do with Maltese students, in subject choice, towards a hobby...*
> *help them develop their talents* (S2).

The above also reflects sporadic elements from Banks' (2017) five dimensions, mainly content integration and prejudice reduction. Despite the educators' will to reach and teach all the diverse students in their classrooms, however, a specific referral to examinations confirmed the intrusion of standardised testing upon educators' cultural responsiveness suggested by Banks (2017).

> *Whether a student does something in English, Arabic, Turkish... what matters is that he understands…*
> *Now, here I am not referring to during an exam* (T3).

Both LSEs expressed their frustration with their inability to fully support students from ethnic minorities due to time constraints and their responsibilities. They also pointed out the extent of the curriculum and the vast syllabi.

> *Teachers have a lot to cover* and *a huge challenge to reach these children, especially when they do not speak English or Maltese* (L1).

2. Barriers that Hinder the Inclusion of Students from Ethnic Minorities

The Language Barrier

Parallel to Cefai et al.'s findings (2019), the language barrier was adamantly ranked as the main cause of frustration for both students and teachers, and the main hindrance to the inclusion of students from ethnic minorities in the school. As observed by Ariza et al. (2019), Attard Tonna et al. (2017), and Darmanin (2013) teachers and LSEs proposed that the placement of students in the Core Curriculum Program can be a huge hindrance to their holistic inclusion.

> *Multicultural classes are often found on the lower level of the spectrum of students... (T1)*
>
> *because of the language barrier.* This *leads to less participation (*T1).

> *…because of lack of evidence of their attainment level. Such makes students fall behind academically* (L2).

> *They get very frustrated when they cannot get through to you, and you get frustrated because you cannot get through to them* (T1).

Although the Migrant Learners' Unit serves at bridging the initial gaps and helping students integrate (Farrugia, Sammut 2020, Vassallo Gauci 2018), educators stated that *not everyone is attending the induction course* (L2) and that *the course is not enough* (L1). Such a finding contests the ideology of integration services expressed by Vassallo Gauci (2018) and raises questions about the recruitment process involved in the provision of such services. The language barrier has also been described as additional stress for students.

> *On top of the culture shock, these students spend from eight till two without understanding a word* (T2).

Such a dense barrier to communication and socialisation opposes Premazzi's (2020) and Vang's (2010) notions of schools and education as pivotal for socialisation. With the idea that schools are micro societies (Bhattacharya 2006), such incongruency may be depicting a society that lacks equity, democracy and social justice.

Behaviours and Otherness

As specified by Cefai et al. (2019), the language barrier also emerged as a contributing factor to bullying and marginalisation. While it was expressed that *students with a sound educational family background are more prone to mix with students from ethnic minorities* (S1), Liu et al. (2019) confirmed that such students can be more academically successful. The latter conflicts with the finding that students from ethnic minorities are often placed in lower-level classes where Maltese students *often demonstrate resistance to speak English* (T2), hence inducing more opposition to the socialisation and holistic inclusion of students from ethnic minorities.

> *He gets bullied because he does not understand* (L2).

An element of prejudice was made evident as it was communicated that certain LSEs might reprimand students of specific nationalities when they speak in their native language. This notion highly contrasts the preservation of identity mentioned earlier by participants and supports Scicluna (2013).

Such attitude is only the case with students from Syria and Libya. These students seem to have a label for coming from third world countries. The interaction with a Serbian student is much different…the Serbian student speaks English and does not wear the veil. There is a form of discrimination ... it is according to where the student

comes from. This attitude is being seen with Syrians, Libyans... I am not saying that they (referring to other educators) do things on purpose. You need to live it every day to notice it. They are unconscious attitudes...It is a mentality...because 'you came by boat' (L2).

Since students can *sense the hostility towards them* (S1), their inclusion can be seriously jeopardised. Such unconscious attitudes suggest a degree of aversive racism and white privilege (Delgado, Stefancic 2012) that, besides inducing marginalisation and segregation, are also portraying the inequity of society at large (Banks 2013, Gay 2003, Sleeter 2013). They also contrast European democratic ideologies (Caruana et al. 2013). On the other hand, they conform to the prevalence of racism in European countries outlined by Human Rights Watch (2020). These elements may shed light on why students from ethnic minorities *would not mix with others and prefer to stay together* (T2). While the latter could be misinterpreted as the formation of *gangs* (S1) earlier, episodes of violence and patriarchal behaviours from boys pertaining to an ethnic minority were also narrated.

> *A male student argued with a girl and threatened that he would cut her throat.*
>
> *A student from an Open Centre threatened a Maltese student that he would hit him with the chain (S1).*
>
> *Male students exhibit dominance over female siblings and lack acknowledgement of female educators* (T3).

The attitudes above were attributed to cultural backgrounds and past experiences. Such may denote stereotypical ideologies. However, the need for students from a migrant background to understand Maltese culture was also pointed out.

> *They need to learn about our culture… what is accepted, what is not* (T3).

As indicated by Cefai et al. (2019), the fact that these students *may even start an educational process as teens* was noted and referred to as a potential cause of stress for students from ethnic minorities. Fear related to stress and estrangement was highlighted by Gorski (2020). Such feelings tend to be misinterpreted and can lead to otherness.

> *I believe that his tension was expressed in his eyes. Unfortunately, his look was misjudged as a threat. In reality, it was the look of fear. (S2)*
>
> *He was still uncertain, insecure because he was feeling lost in a new environment* (S2).

The episodes mentioned can contribute to further marginalisation as they may lead *those with racist tendencies to assert their beliefs when they witness particular scenes* (S1), hence amplifying fears and misconceptions (Sleeter, 1996). As maintained by Gorski (2020) and Debono (2020), the importance of detecting and solving such matters was confirmed.

> *We must identify students' difficulties to facilitate their sense of belonging* (T3).

Basic Needs

Basic aspects of well-being were denoted as extremely important for students from ethnic minorities to function to their best possible potential. Findings correspond to Howard's suggestion (2019) that the achievement gap is a consequence of health and social issues. Moreover, in line with Brown (2020), it was unanimously sustained that a sense of belonging through an ethic of care that breaks barriers is key to learning and happiness.

> *You come to school without socks...without lunch...if you are not feeling comfortable at school, you are not paying attention. I will have difficulty reaching you...so the first thing I have to look out for when I get these students is how to make them as comfortable as possible when they come to school* (T1).

> *If you do not have the basics...if you do not understand, if you do not have what you need, you will not be able to participate...they end up feeling lonely...and will be affected both socially and academically* (L1).

> *Not feeling loved and accepted for whom you are can automatically lead one to develop a sense of deterrence to the place and its people* (S1).

> *knowing that one is loved and accepted can help bring out the best version of himself… and can also help break the language barrier* (S2).

The basic needs of trust and care discussed conform with Debono (2020), Duby (1996) and Cefai et al. (2019) in that multicultural education needs skilled educators to help eliminate uncertainties in students from ethnic minorities and that education that fosters peace and abolishes tensions and goes beyond academic content.

> *There need to be a support educator who understands cultural matters to facilitate the transition of international students into secondary school* (S2).

Facilitating the Inclusion of Students from Ethnic Minorities

Leadership

Irrespective of policies, the centrality of leadership was clearly affirmed. The suggestions of May, Sleeter (2010) and Gay (2003) resonated with the frequent reference to the positive effects of exemplary leadership at all levels to kick-start a *snowball effect* (T3) that induces change in *attitudes, discourse and perspective*s (L2). All educators communicated their belief that they can be agents of change.

> The SLT's *vision induces others to follow* and *the teacher's attitude can influence both students and LSEs (L1).*
>
> *Leadership intelligence, flexibility,* and *open-mindedness are needed. An inclusive person does not need a policy. It all boils down to one's love and genuine respect for other persons* (S1).
>
> *Our role as educators is to lead children who may get distorted ideologies from adults at home. Our direction can help them understand* (S2).

These findings strengthen educators' role as catalysts in bridging attainment and relationship gaps and inducing inclusive practices and mentalities as stressed by Banks (2013), Freire and Shor (1987), Howard (2019) and Muhammad (2015).

Learning for Inclusion

The desire to learn to become proactive and to *share experiences to diffuse better knowledge about different religions and ethnicities to all, including students* (L2) conformed to literature by Debono (2020), Premazzi (2020) and Wright (2020).

> *The more we understand one another (students and educators), the better we can adapt and accommodate change* (T3).

In view of their responsibility of including all students, participants expressed their dismay at the lack of adequate preparation programs to holistically reach the whole spectrum of multiculturalism in schools. Only the LSEs referred to a module on multicultural education in their degree course. While they both confirmed that the latter contributed to greater awareness, they added that more needs to be in place across the board.

> *We have never been prepared for this. When I was at university, these ethnic minorities did not exist* (T1).

> *More awareness about these children is needed to break barriers* (L1).
> *Education leads you to re-evaluate your thoughts. Awareness and mindfulness about these students can facilitate their education and entitlement* (S1).

The above supports Nieto's (2001) claim that an inclusive school culture of respect, equity and belonging needs educators who are willing to acknowledge their need to learn and ameliorate practices.

Positionality

While it was observed that an element of accountability is much needed in the sector, all participants communicated the will to improve their skills and develop the critical cultural competence needed to become multicultural educators. The *willingness to grow and ameliorate, openness to new realities, and disposition* (T3) support Hollie (2018) and suggest a congruency to the EU's Key Competencies (European Commission 2019).

> *I help (name) out of my own free will* (L2).
> *There has to be interest from my end. Perhaps not everyone does it (T3).*

Despite their difficulties, participants demonstrated the human qualities needed to bridge the gaps and fulfil the unique vocation of teaching all students. With educators' will to transmit good values through exemplary leadership, is consistent with what multicultural education pioneers suggest as building blocks to respond to diversity in schools.

General Discussion

This research shed light on a number of factors concerning the inclusion of students from ethnic minorities in one particular Maltese secondary state school. Congruent to Sleeter's view (1993), this study deciphered educators' favourable disposition to reach, teach, and support all students in their physiological, sociocultural, and psychological needs. It opposed interest convergence ideologies (Bell et al. 2005, Delgado, Stefancic 2012) by highlighting the positive outlook of educators towards the inclusion of students from ethnic minorities in this Maltese school as a means to provide a ray of hope for disadvantaged groups and to develop inclusive values in youths for a better future.

In line with Fenech and Seguna (2020), this study underscored the influence of the imbalanced distribution of students from diverse ethnicities. It especially identified

a dense language barrier as the main factor influencing students' integration, socialisation, academic performance, behaviour, and psychological well-being. Such a barrier also puts further stress on educators since it prohibits them from fully reaching and teaching students from ethnic minorities in their classes. Despite educators' disposition, findings suggest that the education of many students from ethnic minorities is at risk unless suitable provisions are in place.

Among many factors that can favour the inclusion of diverse students, leadership at both macro and micro-level stood out as pivotal in changing perspectives and abolishing misconceptions that may lead to marginalisation. In its entirety, this study confirmed Bank's ideology (2013) of educators as the main protagonists and catalysts for successful multicultural education. However, as Nieto (2001) and Farrugia Buhagiar and Sammut (2020) outlined, the urgency to promote cultural literacy as a central 21st-century skill was substantially noted.

With the proper knowledge and experiences, all educators would be assisted in gaining more awareness, empathy, and consequently, critical cultural competence and will to become successful multicultural educators and anti-racist scholars (Scheurich 2012). This research supports current Maltese literature (Ariza et al. 2019, Attard Tonna et al. 2017, Caruana et al. 2013, Cefai et al. 2019, Darmanin 2013) in that more knowledge and support are needed at all levels to accomplish the holistic inclusion of students from ethnic minorities.

Limitations, Reflections and Suggestions

There are limitations worth considering when interpreting the findings presented in this paper. First, there are limitations related to the methodological design of this study. This qualitative study was based on the perspectives of seven educators about their experiences in one Maltese secondary state school. Consequently, the sample size and findings cannot provide a general view of educators' perspectives in all secondary schools in Malta. Secondly, one can argue that the purposive sampling narrowed the choice of participants and that voluntary participation resulted in educators who are more inclined to support the inclusion of students from ethnic minorities (Kumar 2019). Thirdly, considering that gender can influence research outcomes, another limitation could have been posed by the fact that all teachers and LSEs participating in the study were females (King, Harrocks 2010).

Nevertheless, this study has a number of strengths and reflections for the way forward that should be considered. The findings of this study imply that these educators need more knowledge and a strong foundation that supports them in the inclusion of students from ethnic minorities so that all students can benefit from their rightful entitlement. Pre-service teacher and LSE training providers may rethink their current programme of studies to increase the content, study units or modules related to multiculturalism, multicultural education and knowledge construction of

students from ethnic minorities. This also applies to providers who offer courses related to leadership and management for prospective SLT members.

As suggested by Fenech and Seguna (2020), a better distribution of international students in Maltese state schools could facilitate their inclusion. Besides providing the school administration with logistical support, this would potentially abolish the segregation of students, curb fears and facilitate student attainment. Moreover, since lack of language proficiency stood out as a major cause of issues affecting the holistic attainment of students from ethnic minorities, provisions must address the lacuna that is jeopardising students' transition, communication and inclusion. Consequently, this study hopes to evoke better collaborative practices between stakeholders providing pre-integration services (such as the Migrant Learners' Unit) and mainstream secondary schools.

In line with the research participants' suggestion, the sense of belonging of students from ethnic minorities can be significantly enhanced with the recruitment of support educators qualified in multicultural education. This could also be further enhanced by providing training sessions for in-service educators (teachers, LSEs and SLT members) about pedagogies of belonging that engage and benefit all students. Furthermore, the recruitment of an HoD Inclusion in each secondary state school would potentially provide the much-needed attention to facilitate students' transition and inclusion. Such provisions would also provide educators with adequate support to reach diverse students and make way for more accountability in the sector. The right services will ultimately elicit a better inclusive system that would enhance students' academic attainment and emotional well-being.

Other provisions must relate to the consciousness and abolishment of any form of racism, white privilege, colour-blindness, and charity-based support as outlined by Marx and Pennington (2003), all part and parcel of the Critical Race Theory implied by Delgado and Stefancic (2012). Such would give educators the critical cultural competence required to cater for diversity without the involuntary promotion of assimilation. Moreover, it would hopefully lead individuals with negative mindsets and a lesser disposition to develop more awareness and more inclusive attitudes. Ultimately, facilitating cultural literacy and competence across the board would lead to better coherence between diverse communities.

This study aimed to analyse the reality of one secondary school and to reflect on the lessons learnt. The researchers propose further studies which could help achieve better coherence regarding the inclusion of students from ethnic minorities in the Maltese secondary state school context. Further studies may include:

- A narrative inquiry with officials responsible for the induction process of students from ethnic minorities;
- A comparative study about the physiological and psychosocial support provided to students from ethnic minorities in Maltese secondary schools;
- A quantitative study, based on focus groups with the students themselves, about their secondary school experience; and,

- A longitudinal study about the transitions of students from ethnic minorities from primary to secondary education in Malta.

Conclusion

This paper highlighted the educators' views, struggles, resilience, and disposition to include and provide students from ethnic minorities with a more positive school experience. It also presented educators' disposition to forward inclusive values and mindsets to Maltese students. Additionally, it pointed out various barriers hindering educators from reaching and teaching students from ethnic minorities. Given the significance of all educators (irrespective of their role) in catalysing the inclusion of students from ethnic minorities highlighted by this study, it can be concluded that it is time to move forward with practices that reflect current global and local needs and which were elicited by the participants themselves. These include the provision of halal food in the school's tuck shop, the engagement (and not only the involvement) of the families deriving from ethnic minorities within the school, and the provision of a smoother transition for the students from ethnic minorities from pre-integration services to the mainstream school. Moreover, more collaboration, better preparatory programs and support provisions must be in place as soon as possible so that the inclusion of students from ethnic minorities in Maltese secondary state schools, such as this research's setting, is fully encouraged and sustained.

In conclusion, this study supports the recognition and promotion of all educators as protagonists who, besides being the main catalysts for the shift needed within inclusive education, can make the world a fairer place through their teaching and support. Ultimately educators can lay the foundations to break the barriers and bond the borders for a better, inclusive and equitable society.

References

AMBROSIO, J., 2003. We Make the Road by Walking. In: G. Gay, *Becoming Multicultural Educators. Personal Journey Towards Professional Agency.* San Francisco, California: John Wiley & Sons, pp. 17–41.

ARIZA, E., CALLEJA, C. and VASSALLO GAUCI, P., 2019. Lingua, cultura e istruzione nell'aula inclusiva: Educatori di migranti e rifugiati a Malta [Language, Culture, and Instruction in the Inclusive Classroom: Educators of Migrants and Refugees in Malta]. *Rivista Internazionale Di Scienze Dell'educazione E Della Formazione [European Journal of Research on Education and Training]*, *17*(3).

ATTARD TONNA, M., CALLEJA, C., GALEA, S., GRECH, M. and PISANI, M., 2017. Mercy in the Maltese Educational System: Education practices to foster respect for diversity towards the migrant population. *MELITA THEOLOGICA. Journal of the Faculty of Theology University of Malta*, *67*(1), pp. 77–99.

BALDACCHINO, A. and BRIFFA, H., 2020. Diaspora Policies, Consular Services and Social Protection for Maltese Citizens Abroad. In: *Migration and Social Protection in Europe and Beyond: Comparing Consular Services and Diaspora Policies*. Switzerland: Springer, pp. 337–356.

BANKS, J. A., 2013. The Construction and Historical Development of Multicultural Education, 1962–2012. *Theory into Practice*, *52*(1 Suppl.), pp. S73-82.

BANKS, J. A., 2015. *Cultural diversity and education: foundations, curriculum, and teaching*. Routledge, Taylor & Francis Group.

BANKS, J. A., 2017. *Citizenship Education and Global Migration: Implications for Theory, Research and Teaching*. American Educational Research Association.

BANKS, J. A., 2019. *An introduction to multicultural education*. Pearson.

BANKS, J. A. and MCGEE BANKS, C. A., 1995. Equity pedagogy: An essential component of multicultural education. *Theory into Practice*, *34*(3), pp. 152–158.

BANKS, J. A. and MCGEE BANKS, C. A., 2016. *Multicultural education: issues and perspectives* (9th ed.). John Wiley & Sons, Inc.

BELL, D., DELGADO, R. and STEFANCIC, J., 2005. *The Derrick Bell reader*. New York University Press.

BEZZINA, L., 2020. *Policy Coherence and Impact Measurement for Sustainable Development Focus on Policies Impacting Migrants in Malta*. Kopin InterCap.

BHATTACHARYA, S., 2006. *Sociological foundation of education.* Atlantic.

BRAUN, V. and CLARKE, V., 2013. *Successful qualitative research: a practical guide for beginners*. Sage.

BROWN, L. W., 2020. Black and in Grad School: Demystifying the Intersections of Race and Gender in Higher Education. In *Amplified Voices, Intersecting Identities 1*(1) pp. 56–59. Brill Sense.

CALLEJA, C., CAUCHI, B. and GRECH, M., 2010. *Education and Ethnic Minorities in Malta*. The e- SPICES Learning Partnership.

CARUANA, G., CREMONA, G. and VELLA, A., 2013. Language use, perception and attitudes amongst Maltese primary school children. In *Migration, multilingualism and schooling in Southern Europe* (pp. 304–342). Cambridge Scholar Publishers.

CARUANA, M. and FRANCALANZA, J., 2013. *ONE OF US - Towards Full Integration of Refugee Children in Local Schools.* Jesuit Refugee Foundation.

CEFAI, C., 2020. Social and Emotional Education in Maltese Schools. In C. Cefai, L. Akoury Dirani, D. Regester (Eds.), *Social and Emotional Learning in the Mediterranean. Cross Cultural Perspectives and Approaches* (pp. 25–35). Brill.

CEFAI, C., GALEA, N., KERESZTES, N. and SPITERI, R., 2019. *A Passage to Malta. The Mental Health and Wellbeing of Foreign Children in Malta.* University of Malta. Commissioner for Children.

CILIA, R. R., 2012. *Cultural Diversity: Secondary School Students' Perspective*.

COOPER, J. E., HE, Y. and LEVIN, B. B., 2011. *Developing Critical Cultural Competence: A Guide for 21st-Century Educators*. Corwin Press.

CRESWELL, J. W. and CRESWELL, J. D., 2018. *Research design: qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage

CRESWELL, J. W. and POTH, C. N., 2018. *Qualitative inquiry and research design: choosing among five approaches*. Sage.

DARMANIN, M., 2013. The "Smallness" of Minimalist Tolerance. *Education Inquiry*, *4*(1), pp. 31–62. https://doi.org/10.3402/edui.v4i1.22061

DE HAAS, H., MILLER, M. J. and CASTLES, S., 2020. *Age of migration: international population movements in the modern world.* Guilford.

DEBONO, M., 2020. The Experience of Multiculturalism in Schools in Malta: A Qualitative Exploration. *Malta Journal of Education*, *1*(1), pp. 82–104. Internationalisation and Multiculturalism in Maltese Education and Society.

DELGADO, R. and STEFANCIC, J., 2012. *Critical race theory: an introduction* (2nd edition). New York University Press.

DUBY, G., 1996. Introduction. *Mediterranean Journal of Educational Studies*, *1*(1).

EUROPEAN COMMISSION., 2019. *Key Competences for Lifelong Learning.* Op.europa.eu, Publications Office of the European Union. https://op.europa.eu/en/publication-detail/-/publication/297a33c8-a1f3-11e9-9d01-01aa75ed71a1/language-en [Accessed 30-10-2022].

FARRUGIA BUHAGIAR, J., and SAMMUT, L., 2020. Migrant Learners' Unit: Scaffolding a Learning Culture without Silos. *Malta Journal of Education.*, *1*(1), pp. 226–246. Internationalisation and Multiculturalism in Maltese Education and Society.

FENECH, C., and SEGUNA, A., 2020. Internationalisation of Maltese Society and Education. *Malta Journal of Education*, *1*(1), pp. 24–50. Internationalisation and Multiculturalism in Maltese Education and Society.

FIELDING, N. G., LEE, R. M., and BLANK, G., 2017. *The SAGE handbook of online research methods*. Sage.

FREIRE, P., and SHOR, I., 1987. *A Pedagogy for Liberation: Dialogues on transforming education*. Greenwood Publishing Group.

GAY, G., 2003. Planting Seeds to Harvest Fruits. In G. Gay (Ed.), *Becoming Multicultural Educators. Personal Journey Towards Professional Agency*. John Wiley, Sons.

GAY, G., 2018. *Culturally responsive teaching: Theory, research, and practice* (3rd ed.). Teachers College Press.

GORSKI, P., 2018. *Reaching and teaching students in poverty: strategies for erasing the opportunity gap*. Teachers College Press.

GORSKI, P., 2020. How Trauma-Informed Are We, Really? *Educational Leadership*, *78*(2), pp. 14–19. Trauma-Sensitive Schools.

HOLLIE, S., 2018. *Culturally and Linguistically Responsive Teaching and Learning responsive teaching and learning, classroom practices for student success*. Shell Education.

HOWARD, T. C., 2019. *Why Race and Culture Matter in Schools: Closing the Achievement Gap in America's Classrooms. Multicultural Education Series*. Teachers College Press.

HUMAN RIGHTS WATCH., 2020. *World Report 2020: Events of 2019*. HRW.

JACKSON, C. W., 2003. Crystallizing My Multicultural Core. In G. Gay (Ed.), *Becoming Multicultural Educators. Personal Journey Towards Professional Agency*. John Wiley, Sons.

KEEGAN, S., 2009. *Qualitative research: good decision-making through understanding people, cultures and markets*. Kogan Page.

KLEIN, G. B., 2010. The SPICES Training Methodology and the E-SPICES Resources: Their Transferability to the School Context. In C. Calleja, B. Cauchi, M. Grech (Eds.), *Education and Ethnic Minorities in Malta*.

KUMAR, R., 2019. Research Methodology: a step-by-step guide for beginners. Sage.

LANDSMAN, J., and LEWIS, C. W., 2011. *White teachers, diverse classrooms: creating inclusive schools, building on students' diversity, and providing true educational equity*. Stylus Pub.

LIU, J., PENG, P. and LIAND, L., 2019. The Relationship between Family Socioeconomic Status and Academic Achievement in China: A Meta-Analysis.

MARX, S., and PENNINGTON, J. L., 2003. Pedagogies of Critical Race Theory: Experimentation with White Preservice Teachers. *International Journal of Qualitative Studies in Education*, *16*(1), pp. 91–110.

MAY, S., and SLEETER, C. E., 2010. *Critical multiculturalism: theory and praxis*. Routledge.

MEDE., 2012. *A National Curriculum Framework for All*. Ministry for Education .

MEDE., 2014a. *A National Literacy Strategy for All in Malta and Gozo*. Ministry for Education.

MEDE., 2014b. *Respect for All Framework*. Ministry for Education.

MEDE., 2019. *A Policy on Inclusive Education in Schools. Route to Quality Inclusion.* Ministry for Education.

MUHAMMAD, A., 2015. *Overcoming the achievement gap trap: liberating mindsets to effect change*. Solution Tree Press.

NATIONAL STATISTICS OFFICE., 2021. *Statistics on Pre-Primary, Primary and Secondary Formal Education. 2012/2013 - 2016/2017.* Government Printing Press.

NIETO, S., 1999. *The light in their eyes: creating multicultural learning communities*. Teachers College Press.

NIETO, S., 2001. *Language, culture, and teaching: critical perspectives for a new century*. Routledge.

NIETO, S., 2015. *Why we teach now*. Teachers College Press.

NIETO, S., 2018. *Affirming diversity: the sociopolitical context of multicultural education*. Pearson.

PONTEROTTO, J. G., 2010. Qualitative research in multicultural psychology: Philosophical underpinnings, popular approaches, and ethical considerations. *In Cultural Diversity and Ethnic Minority Psychology*, *16*(4), pp. 581–590.

PREMAZZI, V., 2020. Internationalisation and Multiculturalism in Schools. *Malta Journal of Education.*, *1*(1), pp. 74–81. Internationalisation and Multiculturalism in Maltese Education and Society.

SCHEMBRI, H., 2020. How is the Learning Outcomes Framework Responding to an Internationalised School Culture in Primary Schools in Malta? *Malta Journal of Education* (MJE), *1*(1) pp. 106-133.

SCHEMBRI, H. and SCIBERRAS, C., 2020. Ethical considerations and limitations when researching education in small island states. SENTIO, 2, pp. 42-49

SCHEMBRI, H. and SCIBERRAS, C., 2022. A practical guide to conduct research in schools in Malta: Reflections, implications and suggestions. *The Educator*, 7, pp. 55-77.

SCHEURICH, J. J., 2012. *Anti-racist scholarship: an advocacy*. Suny Press.

SLEETER, C. E., 1993. How White Teachers Construct Race. In C. McCarthy, W. Crichlow (Eds.), *Race, Identity and Representation in Education,* pp. 157–171. Routledge.

SLEETER, C. E., 2010. Culturally Responsive Pedagogy: A reflection. *Journal of Praxis in Multicultural Education*, *5*(1), pp. 116–119.

SLEETER, C. E., 2013. *Power, teaching, and teacher education confronting injustice with critical research and action*. Peter Lang.

SLEETER, C. E., and CARMONA, J. F., 2017. *Un-standardizing curriculum: multicultural teaching in the standards-based classroom*. Teachers College Press.

SPITERI, D., 2016. *Multiculturalism, higher education and intercultural communication developing strengths-based narratives for teaching and learning*. Palgrave Macmillan.

UNESCO., 2014. *UNESCO Education Strategy, 2014-2021.* United Nations Educational, Scientific and Cultural Organization.

UNESCO., 2019. *Global Education Monitoring Report 2019: Migration, Displacement and Education - Building Bridges, Not Walls*. United Nations Educational, Scientific and Cultural Organization.

VANG, C. T., 2010. *An educational psychology of methods in multicultural education*. Peter Lang.

VASSALLO GAUCI, P., 2018. Making the Needs of Migrant Learners a Priority. *European Migration Network Newsletter 2017-2018*, 3.

WRIGHT, E., 2020. Facing the Challenge of Preparing Maltese Schools and Students for a Multicultural Society: An Opportunity to Redefine Identity in the Light of "Otherness." *Malta Journal of Education*, *1*(1), pp. 316–346. Internationalisation and Multiculturalism in Maltese Education and Society.