L-Università ta' Malta
Doctoral School

Annual Doctoral Symposium

18 May 2022 | Valletta Campus

Programme & Abstracts

17:00 – 17:05	**Welcome address** *Prof. Alfred J. Vella, Rector*
17:05 – 17:35	**Keynote address** **"The home would be when all of us would become strangers": inhabiting doctoral supervisory relations under adversity** *Prof. André Elias Mazawi, Professor and Head, Department of Educational Studies, Faculty of Education, University of British Columbia, Vancouver, Canada*
17:50	**Parallel Sessions** *See pages 4 – 12 for abstracts*

Session 1
Chair: Prof. JoAnn Cassar, Chair Doctoral Committee
Faculty for the Built Environment

17:50 – 18:10	⊙ **The challenges of the literature to a historiographical review of wartime Malta** *Gianluca Giorgio Falzon*
18:10 – 18:30	⊙ **The Maltese experience of the revolutionary '1968'** *Simone Azzopardi*
18:30 – 18:50	⊙ **Living on a monument: heritage, communities and liveability in Valletta, Malta** *Maria Pia Aquilina*
18:50 – 19:10	⊙ **Mass tourism in Saint Peter's Basilica: impacts, management and diverging values at the Vatican City** *Caterina Ruscio*
19:10 – 19:30	⊙ **Discourses of Islamic education: a comparative critical discourse analysis of selected works from Al-Ghazāli and Tahtawy** *Amani Mohamed Elshimi*

Session 2
Chair: Prof. Ronald Sultana, Chair Doctoral Committee
Euro-Mediterranean Centre for Educational Research

17:50 – 18:10	⊙ **The case for a global guardian to address the ecological crisis: addressing fears of a global leviathan** *Roberto Debono*
18:10 – 18:30	⊙ **On the use of measure-correlate-predict methodologies and energy demand forecasting to assess energy storage capabilities for offshore wind farms** *Michael Mifsud*
18:30 – 18:50	⊙ **Designing primary school grounds for nature-based learning** *Desiree Falzon*

18:50– 19:10	⊙	**Classroom talk: a synthesis and research agenda** *Randolph Peresso*
19:10 – 19:30	⊙	**Women and informal work** *Christine Garzia*

Session 3
Chair: Dr Stefano Moncada, Chair Doctoral Committee
Islands and Small States Institute

17:50 – 18:10	⊙	**Speaker/author profiling in Maltese** *Amanda Muscat*
18:10 – 18:30	⊙	**Media narratives of heroin use in a small island developing state: Seychelles** *Georges Marc Nicette*
18:30 – 18:50	⊙	**Are psychosocial interventions effective in minimising harms to affected others of problem gambling? A systematic review** *Matthew Vassallo*
18:50 – 19:10	⊙	**Social connectedness in the digital age** *Christine Spiteri and Mary Anne Lauri*
19:10 – 19:30	⊙	**PoPL: Proof-of-presence and locality, or how to secure financial transactions on your smartphone** *Yonas Leguesse*
19:30 – 20:30		*Refreshments*

KEYNOTE ADDRESS

"The home would be when all of us would become strangers": inhabiting doctoral supervisory relations under adversity

Professor André Elias Mazawi
Professor and Head,
Department of Educational
Studies, Faculty of Education,
University of British Columbia,
Vancouver, BC, Canada

For some, navigating through a doctoral supervisory relation may be likened to moving through a "terra nullius", an "unclaimed land" of sorts, a land that is hard for any one party to delimit, master, and meaningfully govern. For others, sovereignty over that land presupposes an already well-established domain, in which authority and governance emanate either from the supervisor as expert and high priest, or from the student as customer and emerging autonomous researcher. In between these two horizons of cultural imagination lies a wide spectrum of possible encounters. Notwithstanding, the conditions of world-wide pandemic, climate crisis, emergencies, geopolitical upheavals, immigration, human displacement, internationalization policies, inclusive recruitment, and shifting capitalist economies have further comprehensively reconfigured the structure and meanings of the doctoral supervisory encounter and the dissertation. These dynamics have redefined the conditions under which "doctoral knowledge" is generated, and how questions of positionality, neo-colonial relations, epistemic displacement, and equity should be approached as part of supervisory encounters.

The presentation explores the multifaceted aspects embedded in doctoral supervisory encounters, their vicissitudes, entanglements with power, geopolitics, world crises, and shifting postsecondary structures. Particular attention is given to the awkwardness, mismatches, misunderstandings, anxieties, and hopes that mark supervisory relations and the challenges facing both students and faculty in inhabiting them meaningfully. In brief, in a world in flux, doctoral supervisory encounters are entangled in the dynamics that continue to affect the university, hallowing out, in the words of Barbara M. Grant (2018), "the pedagogy of doctoral supervision – and that of the figure of the supervisor – [which have] become a source of intensified institutional concern and criticism" (pp. 356-357). Within these wider intersecting contexts, the need to articulate a new pedagogy of doctoral supervision, and the practices that would underpin it, have never been more forcefully felt.

Reference:
Grant, Barbara M. (2018) Assembling Ourselves Differently? Contesting the Dominant Imaginary of Doctoral Supervision. Parallax 24(3), 356-370.

SESSION 1

The challenges of the literature to a historiographical review of wartime Malta

Gianluca Giorgio Falzon, Department of History, Faculty of Arts

Postgraduate research on the topic of the Second World War in Malta can be problematic. The doctoral process inevitably mandates the review of scholarly literature, but there is a lack of such literature on the subject which renders a historiographical review a challenging and inauspicious task.

While this dearth may justify the inclusion of published books in a review, it was important for this exercise to qualify the few journals and doctoral theses available in order to identify not merely the research gaps, but also the manner in which the quality of the literature, research available and other factors affected the monographs of seminal researchers in the field. This exercise indicated not only a possible outcome of the eventual historiographical review, but also the motivations and challenges of earlier researchers.

The study shows that although journal articles published in proximity to one another bore similarities in theme, narrative, or method, far too few on the subject of wartime Malta have emerged over some seven decades of history-writing for a real pattern to be ascertained. Rather than influencing each other, select articles were evidently conditioned by other factors, most notably time period and region. Identifying research gaps is challenging because of the fragmentary, divergent nature of singular works. Thus, the reliance on published secondary literature of variable quality is necessary in order for a proper qualification of known knowledge to take place. The body of the historiographical review will need to analyse these works' aims, methods, impact, and reliability as supportive sources.

The Maltese experience of the revolutionary '1968'

Simone Azzopardi, Department of History, Faculty of Arts

1968 was a year of global rupture. From West to East, and North to South, examples of political radicalisation, student activism, thrusts of counterculture and class conflict abound in various forms and with long-lasting implications. Carrying such historical valence and global weight, the 1968 'moment' nevertheless did not manifest itself as disruptive everywhere. Malta did not experience the rupture, of scale and degree, experienced elsewhere. Yet, Malta was going through its own evolutionary, if not revolutionary, transformation which by the late 1960s was already conspicuous, if still contained.

This presentation shall undertake an analysis of the Maltese reception of and reaction to the salient issues of the day with a view to assessing the extent to which these left their mark on the local context. This contextualisation of the local within the global further consolidates the efforts in contemporary historiography to locate Maltese history in the study of transnational connections. To this end, this presentation explores the ins and outs of the endemic process of change, the strains of the local/global antinomy, and how (if at all) local activism fit the metaphor or imaginary of the 'global 1968'.

Living on a monument: heritage, communities and liveability in Valletta, Malta

Maria Pia Aquilina, Department of Conservation and Built Heritage,
Faculty for the Built Environment

Valletta, as a capital city, UNESCO World Heritage Site, and European Capital of Culture 2018, is a space subject to acute tensions between restoration and liveability for its various communities; it is a dichotomy between official and unofficial heritage, between those who designate and look after the site and those who live in and engage with it.

This interdisciplinary research evaluates Valletta as a post-museum space, a museum with bastions as opposed to traditional walls. It investigates the relationship between heritage and community through narrative and phenomenological qualitative fieldwork, which will comprise a wide sample to ensure an equitable representation of the city and its component parts. Through these interviews, oral histories surrounding Valletta will be ascertained; memory and [dis]memory through these narratives will be evaluated; community actualisation within an historic urban centre will be analysed. Ultimately, it will then be possible to analyse the relationship between heritage and community formation within Valletta, and how this relationship subsequently impacts liveability for the communities.

The findings of this research will not only trace the implications of living on a monument but will also reassess how this relationship informs strategies that address social well-being and liveability within the city. The impact of this research will ultimately resonate with other urban heritage centres around the world.

Mass tourism in Saint Peter's Basilica: impacts, management and diverging values at the Vatican City

Caterina Ruscio, Department of Conservation and Built Heritage,
Faculty for the Built Environment

This research will be focused on Saint Peter Basilica in the Vatican, which is one of the most iconic religious and historical centres of Catholicism. Saint Peter's Basilica embodies a long list of values: historical, artistic, political, symbolic and social, that influenced and shaped visitor experience over time.

The research project focuses on:
- *the relationship that the Basilica of Saint Peter has developed with the tourism industry;*
- *the visitors' experience with particular attention on how the pressure of mass tourism may create tensions with the religious value of such a site;*
- *the diverging values of the site and the significant changes in the management of visitors to the Vatican, before and after the pandemic;*
- *the return to more regular tourist activities after the outbreak of the pandemic.*

During the presentation I will describe the chosen methodology that is being used in order to examine the case of Saint Peter's Basilica: the visitor management and visitor experience issues being encountered there. I will also describe some changes in the research methodology that has been extensively rethought in recent months in light of the impact of the pandemic on visitor numbers.

Discourses of Islamic education: a comparative critical discourse analysis of selected works from Al-Ghazāli and Tahtawy

Amani Mohamed Elshimi, Department of Oriental Studies, Faculty of Arts

This cross-disciplinary study aims to explore possible shifts in the Muslim perception and conceptualization of the notions of education, learning and teaching. Selecting two seminal works on Islamic education from different eras, the study analyzes and compares two seminal works on educational philosophy - Al-Ghazāli's "The Book of Knowledge" from the early eleventh century and Tahtawy's "The Trusted Guide for [the Education of] Girls and Boys" from the late nineteenth century.

The study explores genre, conceptual metaphor, discourse markers and speech acts, amongst other discourse patterns and rhetorical development strategies. The analysis is interpreted within theoretical frameworks of Critical Discourse Analysis, shedding light on the socio-cultural context, assumptions, perceptions, gender biases, status attitudes, and other factors that may be shaped by the writer's Islamic worldview and that, in turn, influence learning and teaching. The functions of the Arabic word ʿilm, meaning science/knowledge/ education, and its derivatives are, then, further explored in a larger corpus of works from the Islamic literature, using Arabicorpus concordancer.

The implications of this study are significant in their potential to understand the historical shifts in thought which may impact current philosophies of Islamic education.

SESSION 2

The case for a global guardian to address the ecological crisis: addressing fears of a global leviathan

Roberto Debono, Department of Philosophy, Faculty of Arts

It is universally agreed that addressing climate change requires urgent coordinated global action. Thirty years after the milestone United Nations Conference on Environment and Development held in Rio, Brazil, in 1992, annual anthropogenic global greenhouse gas emissions continue to increase. The Intergovernmental Panel on Climate Change (IPCC) shows that current international efforts to curb greenhouse gases are insufficient to keep global warming within the 'safe' trajectory of 1.5°C.

Limitless economic growth has been shown to be ecologically unsustainable at least since 1972 with the publications of 'Limits to Growth: An Economy for a Finite Planet'. The economic growth imperative, widely acknowledged as a driver of climate change and the ecological crisis, is in part a geopolitical imperative. It stems from a perpetual geopolitical state of nations prioritizing national over global interests. National interests include national security, as well as the pursuit of military, economic and cultural hegemony in a competitive world order. The 'international anarchy' of sovereign nation states, characterized by the absence of a central coercive authority, is arguably unsuitable to address climate change. If this is true, it will inevitably lead to Hardin's infamous tragedy of the global ecological commons, including the atmosphere.

Such a scenario constitutes a case for a coercive global political world order to address the climate crisis with the necessary urgency which characterizes such a challenge. This has implications for state sovereignty and, a prima facie, is construed as jeopardizing the principal of subsidiarity. It also raises the fear of totalitarianism or a Hobbesian global leviathan. This article discusses the necessary and sufficient conditions for a coercive global political order that strikes a balance between addressing the urgent challenge of addressing global climate change while allowing for self-government and self-determination among nations and peoples worldwide.

On the use of measure-correlate-predict methodologies and energy demand forecasting to assess energy storage capabilities for offshore wind farms

Michael Mifsud, Institute for Sustainable Energy

Energy storage is crucial for the continued penetration of renewable energy since the availability of renewable energy rarely matches the demand for electrical energy. The Measure-Correlate-Predict methodology is used to assess the viability of offshore windfarms, while Energy Demand Forecasting is used to manage and plan the electricity grid infrastructure. This research combined wind energy prediction with Energy Demand Forecasting methodologies to size the energy storage capacity for an offshore windfarm and evaluated its economic feasibility.

This research analyzed the behaviour of various regression techniques for Measure-Correlate-Predict analysis and Energy Demand Forecasting. The results from this combination

of techniques were applied to a model which integrated an offshore windfarm to an energy storage system and the electricity grid. Measurement matrices were used to compare the behaviour of the integrated systems based on measured and predicted data from the various regression techniques used for the Measure-Correlate-Predict and Energy Demand Forecasting methodologies.

This created a matrix of results which was used to determine the optimal combination of regression techniques used for Measure-Correlate-Predict and Energy Demand Forecasting. This enabled the establishment of the optimal capacity of the Energy Storage System. The long-term behaviour of the windfarm and of the energy storage system was also predicted. The Levelised Cost of Energy for the windfarm and the Levelised Cost of Storage for the Energy Storage System were then calculated, for different windfarm capacities and energy generation scenarios. Hence, this research establishes a methodology for determining the return on investment on offshore windfarms which are coupled to an energy storage system and the electricity grid.

Designing primary school grounds for nature-based learning

Desiree Falzon, Institute of Earth Systems

This presentation focuses on research carried out in the field of nature-based learning (NBL) and the design of school grounds to support NBL. In a 21ˢᵗ-century context of nature-based solutions, NBL can be utilised as a tool to achieve a transition towards sustainability through its potential to connect children with nature and increase motivation towards ecological behaviour. When carried out through the school curriculum and on school grounds, NBL becomes accessible to all children, including those living in today's increasingly urbanised societies.

Despite growing interest in green school grounds and the NBL approach, the links between connection with nature and specific design features of nature-based spaces in school grounds remain unclear. The need for design guidance is especially relevant for urban schools, which are often built on small footprints, with limited grounds and natural spaces. To address this, a systematic review of peer-reviewed studies of nature-based learning on school grounds was undertaken. Results indicate that there are apparent links between nature-based learning in green school grounds and improved learning and nature connectedness, but significant research gaps on the design of learning spaces to achieve specific outcomes remain.

This research highlights a need for a framework to guide practice in the design of school grounds for NBL in urban schools. Findings from the review and two parallel studies from the local context will be used to create this framework. A proposal for its implementation and testing will be made as part of this presentation.

Classroom talk: a synthesis and research agenda

Randolph Peresso, Euro-Mediterranean Centre for Educational Research

Over six decades of empirical research on classroom talk has enabled us to gain a deeper understanding of this important pedagogical tool. Like all other actions and artefacts observed in classrooms, talk is governed by the cultural baggage of all participants. There are therefore marked differences between talk observed in different countries and systems of education

(Alexander, 2001), in different schools, classrooms and even in different lessons or parts of the lessons, (Lefstein and Snell, 2011). Nonetheless, numerous studies carried out internationally have consistently observed pedagogically significant patterns of classroom talk in relation to both teachers and students.

This presentation seeks to:
- *underline the centrality of talk in the classroom;*
- *frame and justify the use of classroom talk over other terms – such as 'discourse', 'interaction' and 'conversation';*
- *synthesise the current state of the art about what is known about classroom talk.*

This presentation moreover sets out to present an agenda for research on classroom talk in Maltese schools. This is done through the adoption of a sociocultural lens which is underpinned by the view that culture and talk are intertwined. They not only shape each other, but also affect the teaching and learning that occur in local education settings.

Alexander, R. J. (2001). Culture and pedagogy: International comparisons in primary education. Blackwell publishing.

Lefstein, A. and Snell, J. (2011). Classroom discourse: The promise and complexity of dialogic practice. In Ellis, S. and McCartney, E. (Eds.), Applied Linguistics and Primary School Teaching (pp. 165-185). Cambridge University Press, Cambridge, UK.
https://doi.org/10.1017/CBO9780511921605.018

Women and informal work

Christine Garzia, Euro-Mediterranean Centre for Educational Research

"The values, power, and meanings attached to being […] a producer/worker vary enormously depending on where and who we happen to be in an unequal global system" (Mohanty, 2003, p. 146).

One way of grouping workers is according to whether they work in formal or informal work. But what do these social constructions mean? And what are the implications of belonging to either one – or possibly both – of these categories?

More than 60 per cent of the world's employed population – around two billion workers – earn their living in the informal economy (OECD/ILO, 2019). A core aspect of the world of work under contemporary capitalism, informal work stimulates debate and controversy on multiple fronts, partly due to its heterogenous nature. Different constructions of in/formality serve different agendas and, consequently, lead to different policy recommendations on how governments should deal with its occurrence.

Adopting the view that the research process is infused with power dynamics, particularly when researching vulnerable groups, this presentation first addresses the concepts of reflexivity and positionality in the process of knowledge production. Secondly, an attempt to deconstruct the formal / informal work binary is made, providing a more nuanced view of both constructions. Lastly, the presentation delves into the main theoretical approaches to informality, with each school of thought holding different assumptions and ideological foundations on the nature and causes of informality. This part focuses on the intersection of gender and informality, and addresses women's experiences and reasons for engaging in informal work, including structural, institutional and behavioural drivers.

SESSION 3

Speaker/author profiling in Maltese

Amanda Muscat, Department of Linguistics, Faculty of Arts

The ways people use language can reveal a great deal about their personalities and social background. Research suggests that relatively stable traits, which can be biological (e.g. a person's sex), cultural (e.g. a person's social class) and/or related to personality types (e.g. the Big Five, more specifically traits such as extroversion), are subtly reflected in a person's linguistic choices. The exact nature of this relationship, however, remains somewhat elusive (Pennebaker & King, 1999 and Schuller et al., 2013) and this has not been carried out cross-linguistically to any significant extent. This research aims to investigate inter- and intra-speaker variation in written and spoken Maltese in order to attempt to give an account of how linguistic features correlate with specific definable traits and to develop an objective methodology which enables linguistic profiling for Maltese. It is assumed that the linguistic profile of an individual remains constant across different contexts and registers since it can be thought of as consisting of a list of linguistic features which serve as the identifying traits of an individual.

A preliminary analysis was carried out on a sample of recordings collected from 10 participants who were carefully selected with a view to balance in terms of gender and age. The participants also constitute a relatively homogenous group in terms of being dominant users of Maltese. The results of this preliminary study will be reported.

This presentation will also discuss the more general aim of the project, which is expected to generate a model comprising features that are relevant to building a person's linguistic profile. It will conclude with a discussion of the strengths and weaknesses of an approach of this sort to linguistic profiling, and of implications for future research.

References
Pennebaker, J. W., & King, L. A. (1999). Linguistic styles: Language use as an individual difference. Journal of Personality and Social Psychology, 77(6), 1296–1312. **https://doi.org/10.1037/0022-3514.77.6.1296**
Schuller, B., Steidl, S., Batliner, A., Burkhardt, F., Devillers, L., Muller, C., and Narayanan, S. (2013). Paralinguistics in speech and language – state-of-the-art and the challenge. Computer Speech and Language Special Issue on Paralinguistics in Naturalistic Speech and Language 27(1), 4–39.

Media narratives of heroin use in a small island developing state: Seychelles

Georges Marc Nicette, Islands and Small States Institute

This research draws on poststructuralist thinking and methodology situated in social constructionist epistemology. The presentation outlines the use of Foucauldian Discourse Analysis (FDA) to explore/investigate how local text media represents and constructs heroin problems in a small island community. The paper reports on initial part of my doctoral research, which investigates how heroin problems are constructed, performed and maintained in Seychellois culture, exploring the discourses and power relations that constitute heroin

consumption from an island perspective. The current status of Seychelles, having the highest heroin use per capita globally, is seen as alarming, producing moral panic among the population. An understanding of heroin use and practices is critical for policymakers and professionals, opening up debates, broadening policy deliberations, decisions and interventions.

I aim to demonstrate how using FDA in analysing media text has the potential of generating different representations and constructions of heroin use in Seychelles, exploring how these discourses create, define or construct the heroin problem. Foucauldian Discourse Analysis looks at both the construction and effects of discourses by adopting a process of analysis, including rigorous engagement with the texts. So far, three discursive themes have emerged from the media texts analysis. The first one is heroin consumption as a deviance, requiring criminalisation. Secondly, viewing heroin use as a sickness needing a harm minimisation approach. Thirdly heroin users being either deserving or undeserving. The main media texts' analysis also suggests that particular discourses/constructions are privileged over others and that context shaped heroin problems and subjects, making them real and knowable.

Are psychosocial interventions effective in minimising harms to affected others of problem gambling: a systematic review

Matthew Vassallo, Department of Psychology, Faculty for Social Wellbeing

Problem gambling does not only impact the gamblers, but it protrudes onto several affected others who experience adverse impacts; including financial, health, relationship and psychological problems. The aims of this systematic review were twofold: to identify the psychosocial interventions in use to minimise harms to affected others of problem gambling and assess their efficacy.

The methods adopted followed the research protocol PROSPERO (CRD42021239138). Database searches were conducted in PsycINFO, Social Science Database, ERIC, CINHAL complete, Academic Search Ultimate, MEDLINE Complete, and Cochrane Central Register of Controlled Trials.

All randomised controlled trials of psychosocial interventions aimed to minimise harms to affected others of problem gambling. Risk of bias for included studies was done using Cochrane's ROB 2.0.

The identified interventions focused on two approaches to supporting affected others: couples' therapy and coping skills. Due to the similarity between interventions and outcome measures used, a quantitative synthesis was conducted.

From the included trials, there seems to be a lack of significant improvement between the outcomes for interventions and control groups. The goal for future interventions aimed at affected others of problem gambling should focus primarily on their wellbeing instead of getting the gambler into treatment.

Social connectedness in the digital age

Christine Spiteri and Prof. Mary Anne Lauri, Department of Psychology,
Faculty for Social Wellbeing

Social connectedness, herein understood as the psychological bond we feel in relation to others, is considered one of the most basic and universal human needs. Feeling loved,

cared for, and valued are all aspects of connectedness, and engaging in meaningful social interactions is a precursor to both positive health and wellbeing. In fact, we have designed communication technologies to mitigate feelings of distance, and satisfy our need for connectedness.

Although research has shown that a sense of connectedness can be derived across digital platforms, the link of these virtual connections to wellbeing has been inconclusive. While there are obvious benefits to being digitally connected, namely having instant access to valuable information, entertainment, and keeping in touch with friends and family, the quality of online interpersonal relations needs to be urgently examined.

This presentation will share the preliminary findings of a quantitative research study investigating the relationship between social media use and feelings of loneliness.

PoPL: Proof-of-presence and locality, or how to secure financial transactions on your smartphone

Yonas Leguesse, Department of Computer Science, Faculty of Information and Communication Technology

The security of financial apps on smartphones is threatened by a class of advanced and persistent malware that can bypass all existing security measures. Strong cryptography and trusted on-chip hardware modules are powerless against sophisticated attacks that supplant device owners through device input record/replay functionality, effectively hijacking their credentials, privileges, and actions. Similarly, a remote human over a CNC can still break an authentication mechanism that only distinguishes between bot and human. These attacks demonstrate that hardened authentication mechanisms need to assert that it is the rightful local human owner who is affecting some security-critical or financial operation, and not a remote human.

We introduce Proof-of-Presence and Locality (PoPL), a new security measure that tackles these threats by leveraging sensors to prove the physical presence of device owners and therefore discriminate between malware-initiated transaction requests and legitimate ones. Moreover, PoPL neither imposes the expense of additional hardware nor compromises app usability.

In order to demonstrate PoPL's practicality, we developed PoPLar, a challenge puzzle implementation of the PoPL concept that ensures usability even on limited screen sizes by the use of a dendrogram. We have made it available as an open-source library ready to be integrated with minimal effort with existing apps. We demonstrate PoPLar's effectiveness and ease of integration through case studies involving apps from the three top cryptocurrency exchanges and an open-source crypto wallet.

Our upcoming experimentation aims to demonstrate that within the remote attacker model, PoPL is able to distinguish between local and remote human presence, thus securing critical and financial authentication mechanisms. Furthermore, we intend to show that PoPL's dendrogram approach is better suited in preserving app usability from the accessibility perspective as compared to puzzle-solving alternatives.

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