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RESEARCH REPORT

Challenges faced by teachers in the implementation of Agile pedagogy among Grade 12 students in a Dubai public school and leadership practices that could support Agile teaching

Silviya Ivanova Nikleva

Abstract

Background: This study explores the challenges faced by Grade 12 teachers in implementing Agile teaching methodologies in a Bedouin school in the United Arab Emirates (UAE). The existing literature highlights the benefits of Agile teaching in promoting lifelong learning, collaboration, and critical thinking skills among students. However, there is limited research on the specific challenges faced by teachers in implementing Agile teaching in the UAE context.

Aims: The aim of this study is to identify the challenges faced by Grade 12 teachers in implementing Agile teaching methodologies and to provide recommendations for leaders to support teachers in overcoming these challenges. The study also aims to explore the perceptions of school leaders and teachers regarding the effectiveness of Agile teaching in meeting the demands of the 21st-century education system.

Methods: Semi-structured interviews were conducted with 15 participants, including school leaders and teachers. The interviews were designed to elicit qualitative responses and explore the participants' perspectives on the knowledge, relevancy, and relatability of Agile teaching, as well as the challenges and recommendations for its implementation. Thematic analysis was used to analyze the interview data and identify common themes and patterns.

Findings: The findings of the study reveal several challenges faced by Grade 12 teachers in implementing Agile teaching methodologies. These challenges include limited time, inflexible curricula, lack of leadership support, limited professional training, cultural influences, and the need for clearly outlined objectives and coherence across departments. The study also highlights the importance of professional learning communities (PLCs) and the benefits of self-reflection and peer reflection for teachers, and the need for clearly outlined objectives and coherence across school departments to ensure a cohesive implementation of Agile teaching practices.

Implications: The findings of this study have implications for educational leaders and policymakers in the UAE. The study suggests that curriculum adjustments should be made to accommodate Agile teaching methodologies and provide teachers with more flexibility. It also emphasizes the importance of leadership support, regular meetings, and the establishment of professional learning communities to facilitate the implementation of Agile teaching. The study recommends training programs to raise awareness about the benefits of Agile teaching among school leaders, teachers, students, and parents.

Keywords: Bedouin school, lifelong learning, Agile pedagogy, student-centred learning, school leadership

Introduction

This report is based on a dissertation, which was written under the supervision of Mrs. Shakhnoza Samsuddinova, the author's supervisor. This work may be included in a library or may be published elsewhere. The study was prompted by the author's school context: a public school based in the Bedouin area of Dubai, where Agile teaching is not practiced despite the UAE's Vision of delivering high quality education.

Context

The significance of presenting my research on the challenges faced by teachers with Agile pedagogy in a Bedouin school lies in the absence of prior studies on this topic. Typically, surveys and interviews focus on larger schools to accommodate larger sample sizes, leaving a gap in understanding the dynamics in smaller suburban schools like ours. As both a researcher and the HoEd (Head of English Department) at this school, I advocate for more investigations into these unique educational settings. To address this gap, I opted for a case study with an explanatory nature, allowing an in-depth exploration of our current school context. I believe that a case study suits the nature of my study best, as it allows for an investigation of a contemporary teaching practice (Agile pedagogy) in a complex setting (a Grade 12 classroom at a public school based in the Bedouin area of Dubai), where the viewpoints of both administrators and educators are of interest, and where the research philosophy is founded on an interpretive understanding of the world. Despite the rather conservative Bedouin nature of the school, academic and non-academic staff come from the UAE, Egypt, Jordan, Ireland, Bulgaria, and England, which makes this multicultural school environment worthy of further research.

It is essential to acknowledge that the findings cannot be generalized widely, but they can serve as a foundation for other scholars and researchers to expand on Agile pedagogy's implementation and outcomes in diverse educational settings.

Motivation, focus and, questions

Throughout my research journey, I have chosen the following three questions to guide me:

1. What are the benefits of implementing Agile in educational settings from a school leader and a teacher perspective? (Knowledge, Relevancy and Relatability)
2. What are the barriers for it? (Challenges)
3. How can leaders support teachers in this process? (Recommendations)

As a Head of the English department, I have seen first-hand the need for more teaching flexibility when delivering the MOE curriculum. Grade 12 educators follow the provided instructional planners allowing themselves limited to no room for teacher flexibility, creativity, or innovation. The reason stems from certain internal and external challenges which I present through this research.

TALIS is a global survey of teachers and school leaders, which provides valuable insights into learning environments. According to the survey, 47% of teachers in the UAE incorporate problem-solving into their lessons, while 53 do not. However, promoting this type of learning through teaching practices is crucial as it fosters cognitive activation and prepares students for future challenges that may not exist in today's world (OECD, 2020). Following up on the report, the new Minister of Education of the UAE – Ahmad Al Falasi announced through the local newspaper *The National* that

"The same curriculum will be taught; the same learning outcomes will be required but it will be delivered in innovative and different ways according to current trends and needs. The curriculum is there but the biggest challenge was the teachers and the question of the medium of teaching," (Nowais, 2022).

The UAE has already realized the benefits of Agile and has made steps into its implementation in other sectors: government entities (Hajjdiab and Taleb, 2011), healthcare (Moonesar et al., 2020), and business (El Khatib et al., 2022). Whilst the Ministry of Education has provided a training on agility and its importance in an educational setting, teaching in an agile manner is not followed upon. This indicates that leadership has not really seen the connection between Agile teaching and the country's Strategic plan for education. That is why, I have decided to explore the challenges that Grade 12 teachers meet with Agile teaching and based on those suggest leadership practices that could support educators in this process.

Like Massi (et al., 2009), as a HoEd, I have observed the same nature of challenges across departments at our school: instructors often organize their courses with specified subjects and due dates. Some have a regular technique of delivering content and are reluctant or unable to adapt to class dynamics. Agility is the capacity to adapt to diverse learning styles and modify delivery modalities. Therefore, the challenge of meeting deadlines that stakeholders face might be tackled through the implementation of such methodology. This will imply less stress in terms of timelines and more productive energy spent on creativity and development. However, based on the same TALIS report, the teacher-centred approach is considered the safer mode for instruction in terms of delivering content in a multicultural environment like ours, as most teachers are expats, hence do not feel at ease to experiment with new practices. This is another challenge that sets boundaries ahead of the teachers and prevents them from exploring more efficient practices.

This further shows the need for leadership support to help educators with the implementation of more contemporary teaching practices to meet the country's goals. Furthermore, Hajjdiab and Taleb (2011) identified other challenges with the implementation of Agile across other government sectors in the UAE including the absence of an agile master role, overzealous teams, work pressure, and the lack of a pilot project, which coincides with answers I received while conducting the interviews with administrators and educators from my school. Milašinovi and Fertalj (2018) found that lack of motivation, resistance to change, and interpersonal skills were challenges faced by educators integrating Agile pedagogy internationally. In my role as a leader, I strongly believe that all of the above challenges could be tackled through effective leadership practices. However, to deal with any obstacle, a leader and their team should first see the benefits of a change that is awaiting to be implemented.

That is why, through this research paper, I suggest that teaching students in an agile way will provide the ground for them to meet the country's goals by becoming more adaptive and responsive to the changes in a world characterized by high levels of Volatility, Uncertainty, Complexity, and Ambiguity (VUCA) (Veingerl Čič, 2021), where skills like innovation, collaboration, productivity, risk-taking, and agility to support societal goals are required. Having said that, forecasting the exact skills needed in the future is challenging, and it becomes impossible for students to prepare for every conceivable scenario in a world which is in a constant state of flux. Such perspective emphasizes the importance of agility, so that students can be taught to deal with these changes in a constructive

manner; to be resilient in the face of adversity, and to adapt to new situations as they arise. To foster innovation, creativity, and risk-taking in students, it is essential to prioritize their holistic development, encompassing social, emotional, mental, physical, and cognitive domains.

This is where I believe that Agile teaching holds promise. It is a student-centered methodology that facilitates collaborative learning, encourages exploration of real-life problems, and breaks down assignments into manageable iterative tasks. In an Agile classroom, flexibility in interactions between students and instructors takes precedence over rigid syllabi or lesson plans. The method promotes active engagement with the material through drills and prompt feedback; it also allows for filling knowledge gaps, connecting new information to prior knowledge, and catching up on missed learning opportunities. The underlying concept revolves around gradual improvements, continuous review, a design process involving trial and error, and lots of learning by doing. Its core lies in adaptability and flexibility, qualities that learners urgently require to meet the ever-evolving market demands not only within the UAE but also on a global scale (see Appendices 1, 2, 3, and 4). Based on the above, I have formed the opinion that through Agile teaching, students can develop the essential skills and qualities required to thrive in a VUCA world, which aligns with the UAE's Vision 2021 (Vision2021.ae, 2010).

By taking people out of their functional silos and putting them in self-managed and customer-focused multidisciplinary teams, the agile approach is not only accelerating profitable growth but also helping to create a new generation of skilled general managers (Rigby, Sutherland, and Takeuchi, 2017), which accounts for another reason behind why this topic is of national and international significance. Similarly, Kamat (2012) argued that students with an agile mindset will make a smoother transition to the new workforce demands, especially in engineering. John Miller was amongst the first to use Agility in the classroom, as he began experimenting with Agile development in 2009 (Salimzyanova, 2021). He is the Chief Empowerment Officer of Agile Classrooms, and as such he aims to equip both learners and teachers with the skills that they need to excel in the 21st century education, society, and employment. He has seen the benefits of introducing Agile to instructors and therefore has been advocating for its further implementation by others in the field. Masood (et al. 2018) and Noguera (et al. 2018) share his belief that this methodology appears to be one of the most effective in addressing the problem of preparing students for lifelong learning, increasing employment opportunities, and creating conditions for the development of soft skills in digital education. Forren (et al., 2017) found that the adaptation of Agile to higher education produced positive outcomes by increasing student engagement, encouraging students to take responsibility for their learning, enhancing the level and quality of collaboration, and producing higher quality deliverables.

Another study conducted by Venkatraman (et al., 2022) shows that the results of the quantitative and qualitative evaluation of students' skill achievement before and after each activity were promising, with about a 30% increase in the achievement of Higher Order Thinking Skills (HOTS). The team found that the smart classroom activities developed for two subjects provided greater opportunities for student engagement and creativity in the successful achievement of HOTS. In the future, requirements for the qualifications and skills of employees will be higher than at present, because the companies will use new technologies and smart media (Benešová and Tupa, 2017). This further implicates that governments should pay closer attention to the efficacy of their education system in terms of meeting the requirements of the 21st century workplace, as rapid evolution of

technology is observed. As a result, it may be difficult to forecast what precise skills will be necessary in the future, so it is essential to teach people how to adapt to changes with ease.

Inquiry plan and activities

To understand what administrators and educators think about the implementation of Agile pedagogy in a Grade 12 classroom at a Dubai Bedouin school, I conducted semi-structured interviews with my colleagues from the following departments: English, Islamic, Arabic, Maths, Moral, Social and Cultural Studies, Health Science, Biology, Physics, Visual Arts, Physical and health education, as well as Computing Creative Design and Innovation. Each department consists of one subject Leader and two subject teachers. However, only interviews with subject leaders and Grade 12 teachers were conducted, as this was my target group for the study. The school’s principal and vice principal were also interviewed to obtain a fuller picture of the challenges to implement Agile pedagogy in a Grade 12 classroom at the school from an administrative and leadership perspective. A total of fifteen staff members were interviewed for the research. Amongst those, ten out of fifteen hold leadership positions within the school.

Academic Staff		Administrative Staff	
5 Teachers	8 Lead Teachers	1 Principal	1 Vice-principal
Non-Leadership		Leadership	

Each one of them has been asked 12 to 16 questions (Appendix 5) depending on their role and whether further clarifications were needed. As I am the subject lead of the English department, only the respective Grade 12 English teacher was interviewed.

Non-probability sampling techniques, or a convenience sampling method, was implemented. It made the best choice amongst the rest sampling techniques in this case, as I have easy access to the sampling group – Grade 12 teachers and school leadership members. Having said that, due to the nature of the sampling technique, it is challenging to claim that the results are representative. This does not indicate, however, that they will not prove useful in the long term. Such sampling is often employed as a form of exploratory research since it generates ideas and insights that may lead to the conduct of additional, more exhaustive, and representative study (Biggam, 2015).

Interviews with open-ended questions were used to achieve the respective research objectives. I believe they fit the nature of the study best as they are qualitative reflecting upon the “WHYs” of the approach (e.g. Why do you think the MOE has provided a training on Agile teaching?). The interview questions can be found in the Appendices section listed as Appendix 5. A semi-structured interview was my first choice, as such research strategy method allows for spontaneity: depending on the conversation flow certain questions were either added or omitted. Consequently, the second stage of the interviews involved follow-up questions to elaborate on certain responses or explore new lines of thought, making use of a semi-structured interview format. The questions were free from suggestive adjectives or language that could steer respondents towards a particular answer, and jargon and double-barred questions were avoided. Thematic analysis was implemented, which indicates the following process:

Phase 1: Preparing and organizing the data for analysis.

Phase 2: Transcribing the data. Verbatim transcripts were used for the thematic analysis, which means that the transcripts recorded every word that each participant said and are an actual representation of the conversation. The transcripts of the interviews are linked in Appendix 8.

Phase 3: Becoming familiar with the data.

Phase 4: Memoing the data. These memos are, in simple terms, a “conversation with ourselves about our data” (Clarke, 2005).

Phase 5: Coding the data.

Phase 6: Moving from codes to categories and categories to themes.

Phase 7: Making the analytic process transparent.

This allowed for cross-comparisons to be made, as well as similarities and differences to be identified. During the interviews new issues arose, hence new questions were asked, discussed, and analyzed. Qualitative interviewing, using semi-structured questions, makes use of open-ended questions to encourage meaningful responses (Patton 1990), as in there is no limitation to the answers, the interviewees feel less pressure, there is no right or wrong answer. It is based on their personal experience on the matter. While I aimed to maintain anonymity throughout the data collection process by not disclosing the names of my colleagues, it should be noted that complete anonymity cannot be guaranteed. Since I am identified and the study participants are my colleagues, there is a theoretical limitation to achieving full anonymity. All participants were reminded of this verbally prior to the interviews.

I had the opportunity to tailor the questions to the current school dynamics while also making direct connections to the Vision of the UAE. Three out of fifteen interviewees agreed to be recorded through the Otter app, which transcribes voice notes. The rest did not agree on their voice being recorded, so they either sent their answers via email or the author was taking notes as they were answering to the questions. Those that did not feel comfortable answering in English were given the chance to answer in Arabic via email. As I do not speak Arabic well, I relied on my colleague who is a Maths teacher and has a degree in both languages to provide the translation.

Three main categories have been established as per the Research questions that guided me throughout the study: **Knowledge**, **Relevancy**, and **Relatability** (the respective codes have been highlighted in yellow in the transcript), **Challenges** (the respective codes have been highlighted in grey in the transcript), and **Recommendations** (the respective codes have been highlighted in teal in the transcript). The following words were the most used ones as per the data collected through the interviews: **students**, **teaching**, **Agile**, **limited time**, **heavy and/or rigid curriculum**, **teachers**, **training**, **leadership** and as such helped the author identify first the main categories, then themes.

Examples of patterns and cross-references can be seen below. The yellow highlight shows the Teacher **Knowledge of Agile teaching, its relevancy and relatability** (Research question 1); the

A12: **The curriculum** is one of the main challenges that I face, as is **the language barrier** with the students, as our students speak primarily Arabic. And with this, it can be difficult to motivate the students if they don't fully understand what I am explaining.

A13: I think having **the freedom to create your own content** within the classroom would definitely help me use this more often. And having that freedom will just allow the students to **take more ownership,** and we can come up with projects together as a class. And this will encourage motivation.

grey highlight shows **Challenges** (Research question 2); the green highlight shows **Recommendations** (Research question 3):

Example 1

Example 2

A4: There is a **need for further training,** as I personally missed the first one and if they want us to adopt it as practitioners, we will need **more guidance.**

A5: Teaching students to **take control** and **responsibility of their own learning** is always relevant, but it is not easy to implement due to the **time constraints** we are dealing with in Grade 12.

Ethical considerations and relationships

The participants were informed of what the study aimed to achieve, how their answers would be analyzed, and used. Furthermore, they were also made aware of data storage, sharing, and any anticipated secondary usage of the obtained information. In addition, each one of the participants was given a consent form (Appendix 6) that they had to fill out prior to the interviews. The results were analyzed taking into consideration ethical components such as Voluntary participation, Confidentiality, and Anonymity, Safety and Dignity (British Educational Research Association, 2018).

In my dual role as both a school subject leader and a researcher, I was fully aware of the potential influence my position could have on the participants' decision to take part in the study, creating a power dynamic that might lead to conformity or the provision of favourable responses. To ensure the participants' autonomy and ability to make informed choices, I implemented several measures. Firstly, I emphasized the voluntary nature of participation, clearly stating that there would be no negative consequences for opting out or withdrawing at any point. Additionally, I assured participants of the confidentiality and protection of their identities regarding their responses. To foster a comfortable environment and encourage honest feedback, I employed neutral and unbiased language during data collection, actively listening to participants' perspectives without imposing

personal opinions or judgments. These conscientious efforts aimed to establish a safe and supportive space that enabled participants to freely express their viewpoints.

Primary data was collected through the Otter app with three of the interviewees. With six of them I met in person and was taking notes as my colleagues were speaking. With the rest consisting of six people, I exchanged emails. The respective data was then saved and stored in multiple places to prevent misplacement, data theft, or damage. Next, the data was analyzed in a way that minimizes bias. Categories have been identified and cross-comparisons were made, as I managed to collect data from both academic and administrative staff. In each category, similarities, and differences to find patterns were looked for by applying a Thematic analysis. Next, the findings from my empirical research were compared to those found through the reviewed Literature. Finally, conclusions were drawn, so that recommendations on what leaders should do to support Grade 12 teachers in implementing contemporary teaching practices such as Agile could be given.

Data storage regulations were another consideration. I am aware that raw data must be stored for three years after a study's completion (ria.princeton.edu, n.d.). I also comply with the Data Protection Act (1998) and any subsequent similar acts, including, as of May 2018, its replacement: the General Data Protection Regulation (GDPR).

Findings

The existing literature and empirical investigations both delve into the advantages of introducing Agile teaching methodologies within educational environments. They also explore the challenges confronted by educators when implementing these methodologies and propose recommendations for leaders to provide adequate support in this context.

In their interviews, both school leaders and teachers shared that Agile is a methodology that promotes lifelong learning opportunities for the students in response to the 21st century marking demands; it helps them work more collaboratively; learn how to provide prompt feedback; adopt techniques to complete tasks flexibly by being goal-oriented and by seeking multiple alternatives to solve problems; work on real life concepts by taking ownership of their own work. Furthermore, they point out that Agile teaching provides more student-centred environment with more hands-on approach than in traditional classroom setting coinciding with the UAE’s Vision for education. Critical thinking, problem solving, and decision-making are amongst the important 21st century skills that students will benefit from if Agile teaching is implemented within a Grade 12 classroom, as per what academic and administrative staff shared. Through such methodology they will adopt a mindset to respond to change more reflectively but at the same time quickly.

Through the present study, however, Grade 12 teachers involved in the research conveyed that the effectiveness of Agile teaching is hindered by time limitations, inflexible curricula, specific cultural influences, a lack of inter-departmental collaboration, as well as insufficient guidance and leadership support. The challenges discovered through the primary and secondary research are presented in the table below:

Literature review	Empirical research
The limited time to respond to a change	All fifteen respondents view Agile as beneficial but incompatible with the current MOE curriculum timeframe.

The curricula should be taught innovatively	The current MOE curriculum is described as heavy and rigid by ten out of fifteen participants.
The inclusion of staff in the decision-making process	Eight out of fifteen respondents agree that the lack of leadership support is another big obstacle.
The limited number of mentors being assigned to coach new teachers	Seven respondents revealed that there is lack of co-teaching and model teaching practices.
<i>Not mentioned in the reviewed literature</i>	The limited support from parents, students, and colleagues is pointed out as another challenge by five out of fifteen respondents.
The lack of regular professional training	Nine out of fifteen participants shared that there is limited knowledge on why Agile will be beneficial in educational settings. Six out of fifteen pointed out that there is on follow-up on trainings; three said there are no brainstorming sessions for reflection either.
The need for Agile compliant performance evaluation	No clearly outlined objectives and the lack of evaluation forms in place are provided as further examples of challenges to implement Agile methodology by three out of fifteen respondents.
The need for teachers to observe the positive benefits of a new instrument on their own students.	Three respondents answered that there is need for teachers to observe and know about other successful examples of Agile in a Grade 12 classroom.
The need for training on the UAE's Vision and the MOE Strategic plan	Three participants mentioned that not all staff members are aware of the UAE's Vision and the MOE Strategic plan.
The unwillingness to take risks due to the cultural background of the school	Two respondents highlighted that the cultural background of the school can be rather intimidating for some teachers, which prevents flexibility in their teaching style.
The OPEC report on the need of Consistency and Uniformity	Two participants pointed out that the goal to implement Agile teaching should be communicated and sought across all departments.
<i>Not mentioned in the reviewed literature</i>	The language barrier is viewed as a challenge by one respondent.
The lack of motivation	There are teachers who do not feel motivated to adopt a new teaching practice, according to one out of fifteen respondents.
The absence of a pilot project	One of the participants shared that there is need for a project to trigger the process, so that everyone feels there is a common goal/cause that they all need to accomplish.
The high expectations of teachers	<i>No such response has been provided through the empirical research</i>
The lack of physical space	<i>No such response has been provided through the empirical research</i>
The lack of interpersonal skills	<i>No such response has been provided through the empirical research</i>
The structure within the educational institution	<i>No such response has been provided through the empirical research</i>

Based on the challenges presented through the primary and the secondary research of this study, the following recommendations are suggested:

1. Curriculum adjustments to accommodate Agile teaching: Grade 12 teachers need to feel at ease in terms of timeframes and curriculum flexibility. They do not need to be asked why a

page from the textbook had been skipped but rather encouraged to provide an educational environment that promotes student ownership of own learning, collaboration, tackling real life problems, research, and critical thinking. Collaborative meetings with the curriculum team will be helpful, allowing leaders to provide constructive feedback on any challenges teachers encounter while delivering the curriculum. Moreover, these meetings can explore ways to enhance the syllabus, allowing room for flexibility, creativity, and agility among teachers. For instance, lessons or curriculum chunks could be marked as “Additional support” or taken out altogether should they have no relationship to the country’s aspirations and initiatives.

2. Training on the benefits of Agile teaching in educational settings: Administrative and academic staff, as well as students, and parents need to be trained on why Agile is rather needed to prepare learners for the demands of the 21st century market demands. Additionally, one on one, family and group meetings on students’ behaviour and parental involvement in learners’ educational success should be held to further connect all links in the chain by reminding them of the common purpose they all have.
3. Leadership support: Leaders should empower educators by providing constant support, which also strategically advances the broader objectives outlined in the UAE’s Vision 2021.
4. Model teaching and co-teaching practices: Model teaching and co-teaching create a sense of mutual support among teachers, which encourages them to take risks and embrace innovation in their teaching. Such hands-on demonstrations will undoubtedly help educators understand the practical aspects of Agile pedagogy and visualize its potential impact on student learning.
5. Follow up sessions for reflection and brainstorming: To ensure coherence across departments, practitioners should take a proactive approach and receive support at the school level through peer brainstorming sessions. Administrative and academic staff will benefit from regular brief meetings, because in this way they will gain fresh perspectives on implementing Agile. One way is to experiment with different approaches to see which ones work best: Sprint planning, Daily scrum, Sprint review, and Sprint retrospective, Product Backlog refinement (Appendix 7).
6. Professional Learning communities: It is important for teachers to allocate time to self-reflect and peer reflect to discuss the underlying values that are needed for a change to be brought about and whether they have those or not. PLCs are an important factor in such scenarios, as they provide the notion of having support from all sides – like a 360° mirror.
7. Clearly outlined objectives and coherence across departments: At the beginning of the academic year, representatives from each department should come together to map, refocus, and adapt the curricula. Exposing staff, students, and parents to successful implementations of these approaches is crucial, as it helps them understand the rationale behind moving away

from traditional top-down teaching methods. This collective effort fosters a cohesive and effective educational environment that aligns with the school's overarching objectives.

8. Training on the UAE's Vision and the MOE Strategic Plan: Understanding the Vision of the country and the Strategic plan of its Ministry of Education ensures that all stakeholders are aligned with the long-term goals and priorities set by the government. This alignment helps create a unified direction for the entire education system. By being informed about the overarching goals and specific targets, teachers and leaders can make informed decisions and align their educational practices to support the broader objectives of the country. Ongoing training and professional development enable educators and leaders to stay updated with any changes or updates to the Vision and Strategic plan. This adaptability ensures that their approaches and practices remain relevant and responsive to the dynamic educational landscape.

Changes to practice

Based on the findings of my research and the research process itself, some changes were implemented at my school. First, practitioners started expressing more interest in the implementation of Agile, which sparked productive discussions on the matter. In response, the principal organized two Agile pedagogy training sessions facilitated by Scrum masters, which signifies progress towards the implementation of Agile pedagogy within the school. Additionally, more brief meetings to review contemporary teaching practices were held in Term 3, including one training on Agile for parents. Furthermore, I have had two co-teaching sessions with my Grade 12 colleague from the English department and we were both pleased with the results of delivering engaging lessons with very responsive students. Finally, our staff meetings now start with a slide on the UAE's Vision and the MOE Strategic plan, so that everyone is reminded of our common goal as a team. Such steps are particularly important in multicultural settings where hierarchical, top-down cultures have impact on experimentation.

So far, the workshop with parents has had the biggest impact on teachers of Grade 12 students, as parental support is crucial in a Bedouin society. More meetings on the matter will be held, so the successful implementation of contemporary teaching practices such as Agile becomes rather desired by both students and parents. I will be collecting more evidence to observe how classroom dynamics are changing and what else needs to be done for a more student-centred learning environment, where lifelong learning, collaboration, interaction, feedback, critical thinking, and repetition takes place.

Implications for Practice

Existing national and international research on implementing Agile in K-12 classrooms lacks consideration of teachers' challenges and leadership strategies to support them tackle those in Grade 12 in the context of the UAE. My research addresses this gap by providing empirical findings that identified patterns and offered recommendations.

This study proved the need for transparency and consistency in establishing a strong foundation for quality teaching and ensuring a cohesive educational system. Teachers should allocate

time for self-reflection and peer reflection to discuss the values necessary for a change. They should take an active role in their own professional development, utilizing the support offered at the school level through staff meetings and peer brainstorming sessions. Departments should collaborate to map, refocus, and adapt curricula to provide a student-centred environment, which prepares learners for the demands of the 21st century. Successful implementation examples and model teaching of Agile and other contemporary teaching practices should be showcased to help stakeholders understand the need for a shift away from a top-down approach. Furthermore, through this research, it was found that clearly defined objectives, follow-up meetings, brainstorming sessions and leadership support are crucial for promoting coherence across departments.

Reflective evaluation on the process

While the research can be a valuable reference for future studies focused on Agile pedagogy, it is essential to acknowledge its limitations. These include a relatively small sample size of fifteen participants, a restricted two-month data collection period, and potential biases in the questions and translations used. Additionally, my leadership position may have influenced teachers' responses, which is another constraint. Moreover, the absence of input from students and parents regarding Agile pedagogy is an important limitation, affecting the generalizability of the findings to other educational contexts. Hence, further research is warranted to integrate these relevant perspectives.

Next steps

The study has established a foundation for future investigations on Agile, particularly in its capacity to cultivate student ownership of learning, foster collaboration, address real-life challenges, and augment critical thinking – aspects that align closely with my dedication to innovative and effective educational approaches. As previously noted, the present research lacked the input of students and parents concerning Agile implementation. Thus, my forthcoming research endeavours will focus on incorporating those perspectives, recognizing their significance in ensuring the successful integration of Agile practices across diverse educational environments.

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About Camtree

Camtree: the Cambridge Teacher Research Exchange is a global platform for close-to-practice research in education. Based at Hughes Hall, University of Cambridge, Camtree draws on high-quality research from around the world to support educators to reflect on their practice and carry out inquiries to improve learning in their own classrooms and organisations. The outcomes of these inquiries, once peer reviewed, are published within the Camtree digital library under a Creative Commons Licence (CC-BY 4.0). You can find out more about Camtree and its digital library at www.camtree.org.

Appendices

Appendix 1 – Qualifications and skills for Industry 4.0

IT qualifications and skills, Benešová and Tupa (2017)

Table 1. IT job profiles

	Qualification	Skills
Informatics Specialist	<p>Secondary / postgraduate education in IT</p> <p>Practice on a similar position</p> <p>Advanced knowledge of large domain and network management</p> <p>Basic knowledge of working with databases, virtualization and cloud services</p>	<p>Language skills - English, German etc.</p> <p>Autonomy; Responsibility; Flexibility</p> <p>Communicativeness</p> <p>Reliability</p> <p>Ability to plan, lead a small team, organizational skills; Problem solving</p>
PLC Programmer	<p>Secondary school education focused on electrical engineering</p> <p>Practice</p> <p>Proven experience in programming of machinery</p> <p>Programming and knowledge of PLC</p>	<p>Language skills - English, German etc.</p> <p>Knowledge of working with Beckhoff TwinCAT</p> <p>Responsibility; Flexibility; Communicativeness</p> <p>Reliability; Ability and willingness to learn new things</p>
Robot Programmer	<p>Knowledge of off-line and on-line robot programming</p> <p>Experience with basic robot parameterization and calibration</p> <p>Project management, co-ordination of the robot programmer team and coordination with PLC programmers</p> <p>Secondary / post graduate education focused on automation technology</p> <p>Installation of the device into operation</p>	<p>Language skills - English, German etc.</p> <p>Analytical/Logic thinking</p> <p>Responsibility</p> <p>Flexibility</p> <p>Communicativeness</p> <p>Reliability</p> <p>Knowledge of the simulate process; Problem solving</p>
Software Engineer	<p>Secondary / postgraduate education in IT;</p> <p>"Knowledge of C/C++ programming;</p> <p>Knowledge of C # / .NET"; Practice;</p> <p>Basic knowledge of working with databases (SQL)</p>	<p>Language skills - English, German etc.</p> <p>Autonomy; Creativity; Flexibility</p> <p>Analytical/Logic thinking; Problem solving;</p>
Data Analyst	<p>Secondary / postgraduate education in technical or mathematical / statistical direction</p> <p>PL / SQL – advanced</p> <p>UML - advanced</p>	<p>Language skills - English, German etc.; Autonomy;</p> <p>Creativity; Flexibility; Analytical/Logic thinking</p> <p>Knowledge of working with a spreadsheet (Excel)</p> <p>Basic knowledge statistically; Problem solving</p>

Appendix 2 – Qualifications and skills for Industry 4.0

Production qualifications and skills, Benešová and Tupa (2017)


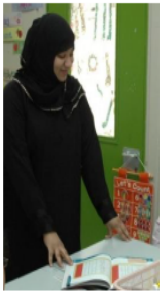
Table 2. Production job profiles

	Qualification	Skills
Electronics Technician	High school education focused on mechanical Practice in the field of handling technology and industrial equipment Performing service inspections	Manual skills Ability to learn how to maintain new machines Flexibility; Autonomy; Responsibility Basic knowledge of electronics, hydraulics Service of the pressure cylinders
Automation Technician	High school education in electrical engineering/automatization Practice and experience of machine maintenance and automated lines	Knowledge of safety standards Language skills - English, German etc. Flexibility; Autonomy; Responsibility
Production Technician	High school education in electrical engineering	Language skills - English, German etc. Logical thinking Flexibility Autonomy Responsibility Ability and willingness to learn new things; Media skills

Appendix 3 – UAE National Program for Advanced Skills (NPAS)



Desired outcomes of the 2010 – 2020 strategy

Students	Teachers
 <ul style="list-style-type: none"> ▪ Proud model citizens – cherishing their national identity, embracing the UAE's history, culture, and Islamic values, and promoting forgiveness and tolerance ▪ Knowledgeable students – creative students proficient in all relevant subjects like languages, sciences and humanities, that will grow to become avid lifetime learners and well rounded adults, contributing to the progress of the nation ▪ Students proficient in needed skills – armed with critical thinking, analytical reasoning and strong communication skills, and destined to excel in higher education and in the workplace of the future ▪ Fit and active individuals – equipped with the necessary aspiration, motivation and knowledge to lead a healthy and productive life 	 <ul style="list-style-type: none"> ▪ Role models – instilling in students the values of education, of the Emirati society, and of good citizenship, and creating responsible and socially aware individuals with strong work ethics ▪ Knowledgeable instructors – committed to providing students with the highest standards of education in all subjects ▪ Creative educators – using innovative proven teaching methods and demonstrating the importance of research, self-education and taking the initiative ▪ Trained professionals – able to detect and identify students with special needs, and to provide them with necessary support to ensure equal opportunities for all students ▪ Attentive counselors – providing adequate guidance and helping students in making the right decisions to achieve all their potential at school and in their future careers

Appendix 5 – Interview questions

The questions (the questions are of qualitative nature).

1. How do you understand Agile teaching?
2. Do you use Agile teaching? Why? / Why not?
3. Why do you think the MOE has provided a training on Agile teaching?
4. Is there a need for further training on Agile? Why? / Why not?
5. As a Grade 12 teacher, do you find Agile teaching relevant to your subject?
6. What are the benefits of Agile teaching in your current context?
7. How is Agility as a concept relevant to education?
8. How can Agile teaching support academic staff to prepare learners for the 21st century market demands?
9. Can Agile teaching be related to the Vision of the UAE and the MOE's Strategic plan?
10. Does School leadership support you in your efforts to implement Agile teaching?
11. What else could be done by leadership to further aid teachers in their efforts to teach through Agile pedagogy?
12. What are the challenges you face when you implement Agile teaching?
13. What would make you consider Agile teaching as a constant in your teaching repertoire?
14. How does Agile teaching affect the flow of the curriculum?
15. How comfortable are you in terms of experimenting with your teaching style?

Appendix 6 – Consent form

Name of researcher: Silviya Nikleva

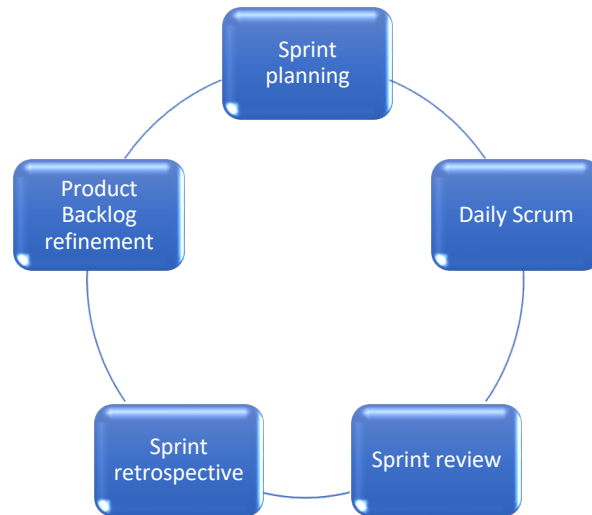
Purpose of research: To explore the challenges that Grade 12 teachers face in the implementation of Agile pedagogy at a Dubai public school

Date: 12.12.2022

Hello, I am going to ask you questions about Agile pedagogy, the support you get to implement it in your teaching repertoire as well as the challenges you face when applying it in your lessons. Your answers will be used as a reference of my empirical research and will be shared with my university. Your name will not be shared. However, your subject area will be. The obtained data will be stored on a USB, in a protected folder on my laptop, and on paper. It will be analyzed through cross-comparisons as per the respective categories that emerged from the conversations. I will be using an app called Otter to record our interviews and then transcribe the recordings into a text with the help of Mr. X, who is a Math teacher of Grade 12.

Signature:

Appendix 7 – Types of Agile meetings



Appendix 8 – Collected data

Complete data files can be found under the following link:

https://drive.google.com/drive/folders/1adllyRidsx_fRVimEuBL-VbdiaD-_OS?usp=sharing