

Beyond the Blackboard: Portraying the Image of the Tech-Savvy Teacher

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Abstract

Keywords:

DT-Savvy; DT-Enhanced teaching;
teacher identity; innovation.

The Tech-Savvy (TS) are teachers mastering Technology Enhance (TE) teaching. Empowered educators create personalized, interactive learning environments, enhancing student engagement, collaboration, and critical thinking. Assessing teachers as TS yields nuanced responses beyond a yes or no. This study aimed to define who is a TS teacher. Twenty-two science teachers in Israeli middle schools shared their perceptions in online focus group discussions aimed at defining who TS teacher is. Data-driven content analysis was performed to identify themes and map perceptions of TS teachers. There are three findings: The first finding is TS teachers are perceived as possessing a range of skills and qualities that set them apart. Their proficiency in TE teaching, adaptability, curiosity, innovation, and commitment to continuous learning enables them to create dynamic and engaging learning experiences. The second finding is that teachers assess their TE proficiency self-perceptions compared to their colleagues and their ability to use Digital Technology (DT) in the classroom effectively. The third finding is that innovation and DT are not always intertwined. There are other ways for teachers to be innovative. Some teachers may feel intimidated by TS colleagues' perceived superior and skill, therefore, shy away from integrating DT into their teaching strategies. However, some educators recognize they possess other essential skills and actively seek to incorporate TE methods alongside other effective teaching strategies. Due to the nature of qualitative research, extrapolating the conclusions to other cases should be done cautiously.

Zusammenfassung

Schlüsselworte:

DT-Savvy; DT-Verbessertes
Unterricht; Lehridentität;
Innovation.

Die Tech-Savvy (TS) sind Lehrer, die die Technologie verbesserter (TV) -Unterricht beherrschen. Befähigte Pädagogen schaffen personalisierte, interaktive Lernumgebungen und fördern so das Engagement, die Zusammenarbeit und das kritische Denken der Schüler. Die Beurteilung von Lehrern als TS führt zu differenzierten Antworten, die über ein Ja oder Nein hinausgehen. Ziel dieser Studie war es zu definieren, wer TS-Lehrer ist. Zweiundzwanzig Naturwissenschaftslehrer an israelischen Mittelschulen teilten ihre Ansichten in Online-Fokusgruppensitzungen, die darauf abzielten, zu definieren, wer TS-Lehrer ist. Es wurde eine datengesteuerte Inhaltsanalyse durchgeführt, um Themen zu identifizieren und die Wahrnehmungen von TS-Lehrern abzubilden. Es gibt drei Ergebnisse: Das erste Ergebnis ist, dass TS-Lehrern eine Reihe von Fähigkeiten und Qualitäten zugeschrieben werden, die sie auszeichnen. Ihre Kompetenz im TV-Unterricht, ihre Anpassungsfähigkeit, Neugier, Innovation und ihr Engagement für kontinuierliches Lernen ermöglichen ihnen, dynamische und ansprechende Lernerfahrungen zu schaffen. Das zweite Ergebnis ist, dass Lehrer ihre TV-Kompetenz selbst im Vergleich zu ihren Kollegen beurteilen und ihre Fähigkeit bewerten, digitale Technologie (DT) effektiv im Klassenzimmer einzusetzen. Die dritte Erkenntnis ist, dass Innovation und DT nicht immer miteinander verflochten sind. Es gibt andere Möglichkeiten für Lehrer, innovativ zu sein. Einige Lehrer fühlen sich möglicherweise von der angeblichen Überlegenheit und Kompetenz ihrer TS-Kollegen eingeschüchtert und scheuen daher davor zurück, DT in ihre Unterrichtsstrategien zu integrieren. Einige Pädagogen erkennen jedoch an, dass sie über andere wesentliche Fähigkeiten verfügen, und versuchen aktiv, TE-Methoden neben anderen effektiven Lehrstrategien zu integrieren. Aufgrund der Natur qualitativer Forschung sollte die Extrapolation der Schlussfolgerungen auf andere Fälle mit Vorsicht erfolgen.

1. Introduction

The impact of DT on teaching methods has been nothing short of revolutionary. Interactive and student-centered approaches have become the norm, with teachers now serving as facilitators and mentors who provide personalized instruction. Students can engage in collaborative learning and real-world tasks, improving their critical thinking skills. Genuine TS profoundly understands DT and its applications, enabling effective integration into education. TS teachers are able to design interactive and

collaborative activities that promote problem-solving and critical thinking. Of course, there are challenges to overcome, such as the need for teachers to adapt to new pedagogical approaches and ensure that all students have equitable access to DT. Despite the obstacles, having a positive outlook and effective strategies can conquer these challenges, resulting in the complete realization of the advantages of DT in education.



The term "TS teacher" is commonly discussed in various studies and can be identified by asking teachers at a particular school. However, its meaning is often ambiguous and open to interpretation. This research aims to provide a more precise understanding of what it means to be a TS teacher.

2. Theoretical foundation

Many have recognized the significance of incorporating Information Communication Technology (ICT) to enhance education and created models and frameworks. This section aims to familiarize readers with the competencies and proficiencies of TS teachers.

2.1. Digital competence

Digital competence is the capability to proficiently and efficiently utilize ICT to accomplish objectives and tackle obstacles. It involves not only technical skills but also critical thinking, creativity, and ethical considerations. Four models and frameworks were chosen to describe TS teachers' competencies: TPACK, SAMR, TAM and DigCompEdu, which are well-known and established.

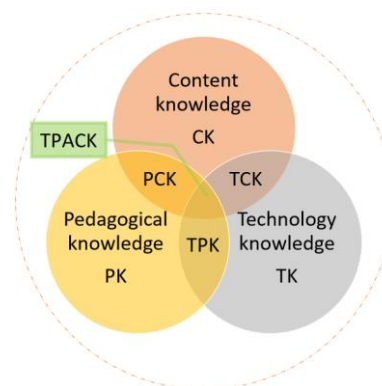
Technological Pedagogical Content Knowledge (TPACK) by Mishra and Koehler (2006) is a framework emphasizing integrating technology, pedagogy, and content knowledge, as described in Figure 1. It describes the knowledge and skills teachers need to integrate DT effectively into their teaching practices. TS teachers, according to TPACK, possess the following competencies:

- Technological knowledge: They understand the capabilities, functions, and applications of various digital tools and DT relevant to their subject area.
- Pedagogical knowledge: They deeply understand instructional strategies, learning theories, and approaches that enhance student engagement and learning outcomes.
- Content knowledge: They fully grasp the subject matter they teach.

The TPACK model emphasizes the intersection of these three domains, highlighting the importance of their integration and synergy. A TS teacher possesses the necessary DT knowledge to effectively use digital tools, the pedagogical knowledge to implement them meaningfully, and the content knowledge to ensure that DT aligns with the subject matter. By having a balanced understanding and integration of these parameters, TS teachers can create dynamic and impactful learning environments that leverage the

potential of DT while remaining focused on effective teaching and student learning outcomes.

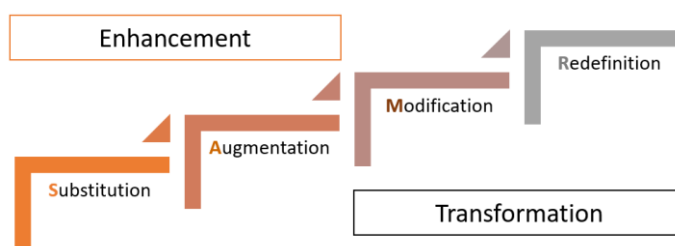
Figure 1. TPACK framework



Substitution, Augmentation, Modification, Redefinition (SAMR) by Puentedura (2006) categorizes how DT is used in education into four levels: substitution, augmentation, modification, and redefinition. According to SAMR, TS teachers go beyond substitution and augmentation to reach the modification and redefinition levels. They possess the following competencies:

- Transformational mindset: They view DT as a tool to transform and enhance teaching and learning experiences.
- Creativity and innovation: They leverage DT to create new learning opportunities and tasks previously impossible.
- Adaptability: They can adjust their teaching methods and use DT based on student needs and learning goals.

Figure 2. SAMR model



DT Acceptance Model (TAM) by Davis (1989) focuses on the acceptance and adoption of DT. It primarily addresses the attitudes and perceptions of users towards DT. While the TAM model does not explicitly mention TS teachers, it highlights the importance of the following competencies for DT acceptance:

- Perceived usefulness: TS teachers recognize DT's potential benefits and value in teaching practice.

- Perceived ease of use: They find DT user-friendly and accessible, allowing them to integrate it seamlessly into their instructional routines.

- Digital Literacy: TS teachers have the skills to find, evaluate, and create digital content, effectively utilizing DT for communication, collaboration, and information management.

- Contextual Factors: TS teachers understand the specific educational context and align DT integration with curriculum standards, pedagogical goals, and student needs.

Digital Competence Framework for Educators (DigCompEdu) by Redecker (2017) is a framework that outlines the digital competencies required for educators. It encompasses six domains: professional engagement, digital resources, teaching and learning, assessment, learner empowerment, and promotion of learners' digital competence. TS teachers, according to DigCompEdu, possess the following qualities and knowledge in each domain:

- Professional engagement: They actively participate in professional networks and communities to stay updated with emerging technologies and innovative practices.

- Digital resources: They can curate, evaluate, and select appropriate digital resources to enhance teaching and learning experiences.

- Teaching and learning: They design and facilitate student-centered and TE learning activities, promoting active engagement and critical thinking.

- Assessment: They use digital tools and data to assess student progress and provide timely feedback to inform instructional decisions.

- Learner empowerment empowers students to become digitally literate, responsible, and creative DT users.

- Promoting learners' digital competence: They guide and support students in developing digital skills, information literacy, and responsible digital citizenship.

2.2. Digital proficiency levels

Digital proficiency refers to an individual level of using digital tools and technologies. It assesses a person's ability to use digital resources efficiently, adapt to new technologies, and achieve successful results in the digital realm. It indicates advanced competence in the digital domain. This section will only discuss the SAMR and DigCompEdu frameworks since the TPACK and TAM models do not indicate digital proficiency levels.

The SAMR model provides a framework for understanding the levels of DT integration in teaching and learning. The model categorizes DT use into four levels: Substitution, Augmentation, Modification, and Redefinition. Each level represents a different degree of transformation in instructional practices through DT integration:

1. Substitution: DT replaces traditional tools without significant improvements, like using word processing instead of pen and paper.

2. Augmentation: DT enhances tasks and learning by adding multimedia and enabling collaboration, like creating interactive slides with videos and links.

3. Modification: DT integration at this level creates new learning experiences that were previously impossible, such as virtual group projects using online collaboration tools for global connections and audience engagement.

4. Redefinition: DT integration at this level creates new learning experiences that were previously impossible, such as virtual group projects using online collaboration tools for global connections and audience engagement.

The SAMR model helps teachers reflect on their DT integration practices and strive for higher levels of innovation. Proficient teachers go beyond substituting or augmenting tasks and actively seek to transform the learning experience with DT.

DigCompEdu framework proficiency levels provide a progression from limited use to advanced and innovative integration of DT in educational practices. The DigCompEdu framework guides educators in assessing and enhancing their proficiency (Redecker, 2017):

1. A1: Newcomer - Limited contact with DT, mainly used for administrative tasks.

2. A2: Explorer - Started using DT but not consistently or comprehensively.

3. B1: Integrator - Uses DT in various contexts and is eager to expand their practices.

4. B2: Expert - Confidently and creatively uses DT to enhance professional activities.

5. C1: Leader - Consistently and comprehensively uses DT, reflects on practices, and inspires others.

6. C2: Pioneer - Questions current practices, experiments with innovative technologies, and leads educational innovation.

TS teachers would be in the higher levels: B2 Expert, C1 Leader and C2 Pioneer. They possess the knowledge, skills, and competencies to integrate DT innovatively into their teaching practices effectively. Moreover, they inspire other teachers.

TS teachers not only possess knowledge of DT but also significantly impact their colleagues as leaders. They innovate TE practices, improving teaching methods to enhance students' learning experience. Understanding teachers' competencies and proficiencies is essential to answer the question: What is the TS teacher's profile, and what needs to be one?

3. Research methodology

Qualitative research through focus groups was used to gather insights on TE teaching. The study involved 22 middle school science teachers from Israel. The teachers were separated into four groups to ensure that each one had sufficient time to express themselves. A total of four virtual focus group sessions were assembled using the popular online video conference platform, Zoom, with each session lasting approximately 90 minutes. The four focus group meetings were via Zoom online video conference and lasted about an hour and a half. The discussed topics were:

- Are you a TS teacher?
- Describe the memories and feelings regarding e-teaching during school lockdowns due to the COVID-19 pandemic.

The discussions held during the focus group were recorded, transcribed, and then analyzed thematically. ChatGPT Artificial Intelligence (AI) also analyzed parts of the transcriptions. To maintain confidentiality, pseudonyms were used to anonymize the names of the teachers mentioned in this research.

4. Results

The study explored TS teachers' competencies and proficiencies toward TE teaching. Three themes emerged from analyzing focus group discussions:

1. The persona of the TS teacher
2. Are we TS teachers?
3. Exploring the innovation-DT relationship in TS teachers

4.1. Theme 1: The persona of the tech-savvy teacher

TS teachers are individuals who consider DT to be natural and handle it with confidence. They are enthusiastic users of DT and quickly grasp new technological tools and platforms. These teachers possess a positive image and are often seen as "cool" by their students.

TS teachers inspire and motivate their students through their adept use of DT. Also, they collaborate with their colleagues, creating meaningful lessons. They actively seek to share knowledge and expertise, inspiring other teachers. They are innovators regarding teaching methods, constantly seeking new ways to engage students and enhance the learning experience. They are always open to renewal and stay updated with cutting-edge technologies. These teachers are early adopters of DT, embracing new advancements before they become mainstream. They frequently incorporate DT in their teaching, utilizing it as a core component of their instructional practices. They challenge the conventional classroom setup by implying non-traditional teaching methods and encouraging interactive and dynamic learning experiences.

TS teachers are also willing to experiment with different teaching methods, including technological approaches, to explore what works best for their students. TS teachers are dynamic educators who leverage DT to inspire, innovate, and create engaging learning environments.

In addition, OpenAI (2023) ChatGPT was used to analyze the discussion transcriptions. Three of the discussions giving new insights were chosen to be included in the findings.

Table 1. Tech-savvy teacher characteristics

TS teachers	Participant	Citation
Considering DT natural	Jack	"DT is natural to me".
Handling DT with confident	Daniel	"I'm not afraid of DT".
Enthusiastic DT users	Nadia	"delighted"; "celebrated"; "thoroughly enjoyed".
Eagerly learners using new DT - Quick learners	Nadia	"I learn fast".

Inspire students	Emma	"I love these things; I once conducted surveys. They [the students] were excited about it".
Collaborate with colleagues	Karen	"From there, a whole world opened up, and I created a website for teachers".
Innovators of using DT to improve teaching capabilities	Nadia	"I established a tradition...an online MOOCathon for all the students in the school and the teachers". [MOOCathon: a Massive Open Online Courses (MOOC) marathon]
Innovators of using DT to improve teaching capabilities	Adam	"I was also part of the Mindset program for educators who initiate digital technological solutions".
Eagerly learners using new DT - Constantly seek renewal	Rachel	"I made an effort to be as TS as possible and always willing to introduce new things".
Equipped with cutting-edge technologies	Liam	"I simply have two screens with a microphone, and that was all I needed".
DT early adopters	Liam	"Zoom... even before that, I was doing it. It's not like the pandemic suddenly introduced a new world; I was already there before".
Enthusiastic DT users in lessons	Ella	"If I could replace textbooks and workbooks with computers, I would prefer it".
Engaging students - Personalized students learning	Nicole	"I love creating technologically integrated lessons and using differentiated instruction".
Engaging students - Experiment TE methods	Jack	"I was surprised by the collaboration among students".
Creative	Karen	"I learned by myself how to create games of all sorts, and every type of game has its own rules. It was a fascinating challenge for me".

First discussion OpenAI (2023)

Anna: "I consider myself quite literate, interested in all kinds of software and cool things. Come on, let's say that the equipment to work with at school is not enough for me, not adapted to me".

ChatGPT: "Based on this, Anna can be considered as a teacher who falls into the category of tech-savvy teachers or tech enthusiasts but faces challenges in implementing technology due to external factors like resource limitations".

Anna required advanced technology, and ChatGPT recognized that she was a TS. However, her school DT restricted her capabilities.

Second discussion OpenAI (2023)

ChatGPT: "Sarah admitted to being less TS and has a more limited integration of digital technology in their teaching".

Devorit: "Please explain your choices about Sarah, she said she is very good with technology".

ChatGPT: Based on Sarah's response, she stated that she sees herself as TS or at least making a strong effort to engage with technology".

Devorit: "Maybe the reason is that when Sarah was asked if she defined herself as a TS teacher, she answered I am very good and did not elaborate".

ChatGPT: "It's important to note that without further elaboration from Sarah, it is difficult to assess the specific extent of her tech-savviness or the specific technologies and strategies she employs".

Sarah's simple "Very good" response led ChatGPT to conclude that she may not be TS. While many TS teachers enjoy discussing digital advancements, Sarah did not seem to share this enthusiasm. As a result, ChatGPT classified her as tech-resistant.

Third discussion OpenAI (2023)

Grace: "Until the COVID-19 pandemic, I defined myself TS, but I was not a digital person".

ChatGPT: "Sarah admitted to being less TS and has a more limited integration of digital technology in their teaching".

Devorit: "Grace was a techno-pedagogy coordinator in school. What is the reason you think she is Tech-resistant"?

ChatGPT: "Based on the available information, the impression Grace gives is TS. Based on her quote, the impression Grace gives is hesitant".

Although ChatGPT recognized her TS skills, her lack of confidence and hesitance led to think she was not.

4.2. Theme 2: Are we tech-savvy teachers?

The teachers in the focus group were asked if they were TS. Not surprisingly, their answers were not simply yes or no, but rather a spectrum of responses ranging from yes to no. The explanations provided by the teachers, on the other hand, were interesting as they clarified the perspective in which teachers position themselves on the spectrum. The factors upon which the teachers based their TS level are presented in **Error! Reference source not found.**

TS teachers are determined in relative terms to colleague teachers. Several teachers from the focus group compared themselves to other teachers to

determine if they were TS. For instance, Ella expressed insecurity in her answer about being TS and concluded that she is less TS than other teachers in her school: *"I try to think about myself if I'm actually a TS teacher, but I'm not so sure about the answer. In our school, I am less TS"*. On the other hand, when Rose compared herself to teachers in her school and decided she was more TS than them: *"It depends on how you look at it, I feel that I am quite TS compared to many other teachers"*. Nadia instructed teachers in her school on how to use Zoom and appropriate teaching practices during the COVID-19 pandemic school lockdown. It was clear to Nadia that she was more proficient in integrating TE than other teachers: *"I taught everything in the book about Zoom. I instructed techno-pedagogical teaching. I trained teachers on the subject and celebrated during this time"*.

Table 2. Factors for TS self-assessment

Factors determining TS	TS teachers	Non-TS teachers
Familiarity with digital tools	Larger number <i>"After the pandemic [COVID-19 pandemic] and during the pandemic, we truly became TS with many more tools"</i> (Grace).	Smaller number <i>"Before the pandemic, I defined myself as TS, but I wasn't really TS"</i> (Grace).
Frequency of using ICT in lessons	High <i>"I use a lot of integrated tasks that I build"</i> (Nicole).	low <i>"I don't see myself working with students in a TE way enough"</i> (Alice). <i>"I think I'm TS, but not enough, meaning there is room for improvement"</i> (Julia).
Level of confidence	High level <i>"I always use presentations, digital tools, especially the digital whiteboard, so it was very easy, I was in full control"</i> (Rebecca). <i>"I'm not afraid of tech, I enjoy it"</i> (Rose).	Low level <i>"Using presentations and such is easy, but, for example, I haven't done the tech-integrated biology exam because it's always so complex... So I'm not that tech-integrated"</i> (Adel). <i>"Many teachers didn't relate with it; I don't know if it was because it</i>

was difficult for them"
(Rose).

The confidence level of teachers implies TS teachers. TS teachers demonstrate a remarkable level of confidence in their digital competence in contrast to non-TS teachers, who may exhibit uncertainty or reluctance.

4.3. Theme 3: Exploring the innovation-DT relationship in tech-savvy teachers

TS teachers are considered innovative. However, it is not their tech-savviness that causes them to be innovative, but their innovation makes them TS. Nadia, for example, is a TS teacher. However, when asked to define herself as a TS teacher, she saw herself more as an innovative teacher: *"I think I'm more of an innovative teacher than a TS teacher. The truth is that I use DT, I learn quickly. But I also innovate even without DT"*. Emma also referred to innovation as physical skills in addition to digital ones: *"I would be happy to have a workshop where I have computers and the option to send them now to glue and scissors and creating with nails and screws and wood"*. Emma explained this by stating that, like anything that repeats itself, it is no longer innovation, so tech-integrated instruction becomes non-innovative: *"If I constantly teach with the same method, the kids are dying from it as if I'm not educating them for changes"*.

Although tech-savviness does not indicate innovation, the rapid advancement of DT allows teachers to innovate. Rachel expressed a desire to learn new digital tools. She believes they bring students new and exciting possibilities: *"I don't have enough new digital tools... I want cooler things and need time to learn them. To receive training on these things so that I can engage students in a way that is not dry and boring"*.

5. Discussions

5.1. Portraying the tech-savvy teacher

The ideal TS teacher portrait emerging from the findings akin's to a superhero in the educational realm. They possess an extraordinary natural blend of skills and qualities that enable them to harness DT power to revolutionize teaching and learning. Like superheroes with a versatile toolkit, they possess an extensive repertoire of digital tools and platforms they expertly wield to engage, educate, and empower their students. With superhuman adaptability, they fearlessly embrace new technologies and eagerly explore innovative teaching methods, constantly pushing boundaries to create immersive and dynamic learning

experiences. Just as superheroes inspire and uplift others, the TS teachers are a beacon of inspiration for students and colleagues, sharing their knowledge and expertise generously. They possess the ability to harness the power of DT to overcome educational challenges and bridge gaps, equipping students with the necessary digital skills and preparing them for the ever-evolving demands of the modern world. Armed with their creativity, collaboration, and critical thinking superpowers, the TS teacher strives to transform the traditional classroom into a vibrant and inclusive digital space where every student can unleash their full potential. In their unwavering commitment to empowering the next generation, the TS teachers indeed emerge as extraordinary superheroes in education.

Although the article's authors were familiar with the participants, OpenAI (2023) ChatGPT solely analyzed their language. The analysis conducted by ChatGPT confirmed the description of TS teachers mentioned above, as any hesitations or weaknesses were interpreted as characteristics of non-TS teachers. When comparing the TS teacher portrait emerging from the findings to the theoretical frameworks, numerous similarities are evident, as seen in Table 3. Next, an insightful discussion of these similarities will follow.

The TPACK framework outlines three key competency areas for teachers: Content, Pedagogy, and DT Knowledge. In a recent study by Saubern et al. (2020), a measure was presented to assess the confidence of TS teachers in their ability to use DT to support their students' learning. These teachers share their knowledge, work collaboratively with colleagues, and actively engage students in learning. However, the TPACK framework does not account for other characteristics of TS teachers, such as natural proficiency, willingness to learn new technologies, innovation, and creativity. Interestingly, it does not highlight the importance of integrating technologies into lessons, a crucial aspect of DT knowledge within the TPACK framework.

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other characteristics of TS teachers, such as natural proficiency, willingness to learn new technologies, innovation, and creativity. Interestingly, it also does not highlight the importance of integrating technologies into lessons, which is a crucial aspect of DT knowledge within the TPACK framework.

Table 3. TS teacher portrait reflection in models and frameworks

	TPACK	SAMR	TAM	DigCompEdu
TS Teachers Image	Saubern et al. (2020)	Falloon (2020)	Mazman Akar (2019)	Redecker (2017)
Considering DT natural			✓	
Handling DT with confident	✓			
Eagerly learners using new DT			✓	
Innovators of using DT to improve teaching capabilities		✓	✓	✓
Inspire students				✓
Collaborate with colleagues sharing knowledge and expertise generously	✓		✓	✓
Creative				
Enthusiastic DT users in lessons		✓		✓
Engaging students	✓			✓

The SAMR model outlines four proficiency levels, with TS teachers occupying the highest two levels. These teachers innovatively utilize DT to enhance their teaching capabilities and foster high-order thinking skills in their students. Therefore, DT integration is essential for TS teachers, as Falloon (2020) emphasized. Notably, the SAMR model does not focus on the competencies or characteristics of teachers.

According to the TAM model, teachers' behavior influences DT adoption. Mazman Akar (2019) defines TS teachers as early adopters of DT and correlated

innovation. These teachers consider DT useful and willingly share their knowledge with their colleagues. They find it easy to use DT due to their natural proficiency and are enthusiastic learners of new DT. It should be noted that the TAM model does not fully address how teachers integrate DT into their instruction when working with students.

DigCompEdu framework is a practical guide defining teachers' DT competencies and proficiencies. It focuses on TS teachers' profession and includes the students' aspect, not their perceptions.

During focus group discussions, it was discovered that the literature inadequately represents the creative skills of TS educators. Creativity is a multifaceted process encompassing cognitive and physical faculties, influenced by environmental factors and individual personality. A unique experience or activity related to a specific topic necessitates imagination and intelligence to yield a tangible output (Mullet et al., 2016). Experts evaluate creativity based on originality and usefulness, although they use different terms, with some equating "novelty" with originality and others using "appropriateness" and "effectiveness" for usefulness (Abdulla & Cramond, 2016). The elusive nature of creativity or its association with the arts might be the reasons why literature does not mention it.

5.2. *Are we tech-savvy enough?*

Meeting high standards is an expectation of teachers by various stakeholders such as society, parents, students, and principals (Bećirović, 2023, pp. 16-22). Comparing oneself to TS colleagues is an excellent way for teachers to assess their technological proficiency. Seeking inspiration from such colleagues can help improve digital proficiency (Bećirović, 2023, p. 58). However, some teachers may feel inadequate and give up, leading to a reluctance to adopt DT. Unfortunately, this negative attitude impedes TE teaching (O'Brien, 2020).

Ursavaş et al. (2019) have found that social and subjective norms heavily influence DT acceptance in teaching. Therefore, it is of utmost importance for school management to establish a well-crafted organizational policy that promotes the development of digital proficiency among teachers. In addition, fostering a culture of learning from fellow educators can prove highly advantageous (Admiraal et al., 2019).

5.3. *Tech-savvy teachers and innovation*

Innovation in education means introducing new ideas, methods, or techniques that improve the quality of teaching and learning. Innovation can involve using DT, creative approaches to curriculum design, or novel teaching strategies (Mazman Akar, 2019).

The teachers in the focus groups implied they are more innovative than TS teachers meaning teaching in non-traditional ways, both with DT or without. TS teachers often are innovative. According to Mazman Akar (2019), innovative teachers appreciate DT's usefulness and ease of use. Moreover, they harness DT to innovate teaching.

6. Conclusions

This research aimed to clarify the image of a TS teacher by using focus groups consisting of teachers and comparing their given characteristics to leading theories about teachers and DT. The portrait was constructed of characteristics, competencies and proficiencies. The perfect teacher who can expertly integrate DT flawlessly into their teaching methods may not exist, but identifying the traits of a TS teacher is still crucial. By acknowledging where we fall on the spectrum between non-TS and TS teachers, we can learn from each other and improve our teaching techniques. Ultimately, this will result in better quality education for our students, aligning with the demands of the digital era.

As this research included a specific population that participated, its findings are limited to this group and cautiously implied in other groups. Moreover, the theoretical foundation was based on five well-established models and frameworks chosen carefully by the author. Nevertheless, more were not included that may provide different points of view on this subject.

The utopian TS teacher image lights the way and inspires teachers with the highest digital proficiency. Further research on TS teachers' classroom performance and the implications on their students will broaden the knowledge of TE teaching effectiveness. Different directions of investigation would be the role of school leadership and institutional support in fostering a culture of tech-savviness among teachers, examining the organizational factors that facilitate or hinder the development of digital competencies.

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Authors note:

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