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How Digitalized are School Students? Determining Digital Competencies and Motivation Factors in Using Technology for Learning

Muhd Khaizer Omar, Dalia Umaira Ahmad Ruzaidi, Mohd Hazwan Mohd Puad & Rosnani Jusoh

Department of Science and Technical Education, Faculty of Educational Studies
Universiti Putra Malaysia, 43400 UPM Serdang, Selangor
Emil: khaizer@upm.edu.my

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Abstract

Technology in education has placed a great necessity in our education system. The teaching and learning process demonstrates more technology optimization due to the uncertain ecosystem that is happening around the globe. New modalities are being introduced as pedagogical supports to enrich students' learning experiences. However, a few issues arose related to motivation and adaptation to digitalization in the learning milieu among young learners. For instance, educators lack competency in utilizing specific technology and less motivation to engage students optimizing specific digital applications supporting their learning in the most effective ways. This research determines the relationship between digital competency and the motivation of secondary school students in the Klang Valley area. A quantitative correlation study design was employed involving 260 students who enrolled in Design and Technology (D&T) subjects from four public secondary schools. A self-developed questionnaire was validated by experts and piloted as instrumentation. The data of this research study was further analyzed using Statistical Package for Social Sciences (SPSS) version 27 software involving descriptive and inferential analysis. The findings were discussed and it is hoped the findings of the study would enlighten the educational stakeholders to spearhead the digitalization effort in the nation.

Keywords: Digitalization, Educational Technology, E-Learning, Covid-19

Introduction

The use of technology in education is changing and becoming more prevalent. Technology advancements in education are viewed as beneficial for promoting the teaching and learning process (An & Oliver, 2021: Christopoulos & Sprangers, 2021). The desire for and interest in using technology, such as knowledge of digital applications in education, has an effect and can aid in reaching the objective of providing every student with relevant instruction and learning (Abdulrahaman et al., 2020). For schools to keep up with the changes in modern education, the usage of digital learning methods must be expanded. It is interesting to note that almost all disciplines taught in secondary schools today apply myriad teaching

methodologies due to the development of digitalization in the educational system (Olofsson et al., 2021).

Beginning with traditional teaching, e-Learning and eventually mobile learning were developed to keep up with digital education (Abduljawad & Ahmad, 2023; Malik et al., 2019). Interactive learning resources such as modules, websites that offer scientific information and tasks, videos, music, and applications that can be accessed through tablets and smartphones are a few examples of interactive materials used in teaching and learning. By using these materials, teachers increase their students' understanding levels and ignite their curiosity about learning more in-depth details about a certain topic (Viktória, 2022). Therefore, teachers need to stay current with their subject matter and understand how to research it as thoroughly as possible to be more approachable than their students (Raus et al., 2019).

The prevailing presumptions in some research contexts about teachers' lack of skill in teaching Design and Technology (D&T) subjects is one of the most heated discussions in the Malaysian secondary school system. There was a supposition that since most teachers were not graduated with information technology or computer-based qualifications; students are less proficient in using digital applications properly, which may in some way affect their motivation levels (Sarah et al., 2017). Because effective teaching cannot be accomplished solely through “chalk and talk”, design and technology subjects demand significant expertise in the operation and usage of digital programs. Not all teachers, particularly those who are nearing retirement, have expertise in computer technology (Halim, 2020). According to a study by Sumarni and Zamri (2018), experienced secondary school teachers still fall short of technological competency requirements and are less skilled in the use of ICT technologies. This important problem may be a sign that students are having difficulty understanding the lesson material and eventually accomplishing the learning aim for each D&T course. The ability of teachers to introduce a variety of digital tools, including programming languages, handle advanced tools, and write codes is a prerequisite for relevant learning in the D&T.

Review of Literature

The global educational landscape goes through a transformation. In particular, the educational system has experienced a rapid shift and adopted a new trend; thanks to technology (Sahir & Ayub, 2015). This is evident in the way education has evolved, placing a strong emphasis on culture and proficiency among students in the area of ICT (Fadzil et al.,2015). A culture of using digital tools in teaching and learning sessions emerge in the modern educational system (Rahman et al., 2015). Technology-assisted learning is becoming more and more prevalent, particularly in the sphere of education. Also, technology-assistive tools can promote diversity in the process of teaching and learning. Salleh and Manaf (2017) added digital learning would reduce students' reliance on teachers and place a greater emphasis on student-centered learning in line with the demands of 21st-century learning.

The use of digital applications in education should be best utilized so that traditional teaching can be enhanced by incorporating technology into learning. This will encourage student-centered learning. Yet, it might be challenging for a teacher to use applications efficiently if they have just rudimentary technical skills to manage the usage of digital tools. Even though the use of digitalization in teaching and learning becomes more common among teachers, Noh et al (2013) asserted that it still causes certain teachers anxiety and discomfort. Its

incorporation into teaching and learning is impacted by the teachers' mindset. Many technology advancements are underutilized because teachers prefer the familiarity of using traditional teaching to trying a new method.

Flexible and interactive learning activities are crucial in today's educational environment to make it simpler for students to advance their knowledge both inside and outside of the classroom learning struggle among students, Ahmad and Hashim (2016) findings are due to teachers' lack of technical proficiency. So, if a teacher wishes to include technology in their lessons, they must at least have a basic understanding of how to use computer programming and application. The learning content should be updated and revisited twenty-four seven to encourage learning settings in virtual learning mode (Zainul et al., 2017).

Motivation is an internal driver and has a strong influence on improving the effectiveness of digital learning implementation. Motivation is an entity resulting from various factors (multi-factorial) that can contribute to more effective and developed learning (Bidin et al., 2019). However, in the context of this study, motivation is defined as a force that drives thoughts, feelings, and behavior that aims to fulfill wants and needs to reach a level of satisfaction. Several factors affect the formation of motivation including attitude, self-confidence, goals, involvement, environment, and self-value. The positive attitude of the learner is a factor that affects the level of motivation toward learning (Hakim et al., 2015). Digital learning is a learning process equipped with an internet connection together with digital hardware such as a laptop, tablet, and mobile phone through various applications.

Gaining motivation for learning is crucial for student success (Williams-Pierce, 2011). Student engagement in the teaching and learning process is equated with student motivation (Taormina & Gao, 2013). As a result, giving deliberate educational opportunities, fostering intellectual growth, and teaching the mind can all be used to motivate student learning. This strategy can encourage students' interest in self-discovery and challenge (Corno & Anderman, 2015).

In general, motivation according to Matsumoto (2009) means the willingness to make an effort in pursuit of a goal. One of the important aspects of knowledge development and competency is the motivation of the students themselves which consequently contributed to a positive impact on the academic achievement of students. A motivated student is a student who is interested in learning and makes an effort to learn. Undoubtedly, the teacher’s pedagogical approach is also one of the factors that encourage student motivation (Nizan, 2014). In addition, an attitude or interest in teaching and learning can cultivate the practice of digital literacy for stakeholders of academic institutions to support the concept of digital learning as an effective method of effective learning (Abidin et al., 2014). This is in line with the nation’s digitalization learning strategic planning and contemporary education that emphasizes student-centered learning. Students today are more motivated to learn if the teacher uses the convenience of digital technology as a teaching aid while teaching (Asmawati et al., 2019).

If students are given the right opportunity to choose their preferred learning supports, the level of student motivation will increase to learn the subject matter (Collins & Halverson, 2009). For example, the use of digital applications in teaching and learning sessions allows

students to choose the level of learning according to their abilities. The results of a study conducted by Liao et al (2017) show that virtual reality learning using technology is highly accepted by students and has a positive impact on their self-learning. Bolkan and Griffin (2017) emphasized that a teacher needs to be versatile by diversifying teaching methods during the teaching process to attract students' interest and motivation.

Valentín et al (2013) explained that the use of ICT is recognized as a tool that seeks to help improve and enhance student motivation in learning. Chen et al (2014) have put forward their view that the deterioration of learner achievement may be caused by motivation. Students who lack motivation will show low performance in achieving academic goals (Awanbor, 2005). Motivation for learning among students is due to the homogeneous and one-size-fits-all nature of teaching in which teachers track their performance (Norzan, 2016). Therefore, the method for motivating students to achieve academic excellence is an important matter that needs to be realized and given attention by those involved.

Digital learning is said to attempt to increase learning motivation. A study by Theodoropoulos et al (2017) has proven digital games can be utilized as a memorable learning environment and increase learner motivation because it provides a good quality learning experience. At the same time, Hosseini et al (2019) also stated that digital or technology-based learning has received significant attention in educational pedagogy as an effective way to increase student motivation and engagement in the classroom.

With the rapid development of digital applications, teachers can implement teaching and learning based on the use of computers or digital applications in teaching to improve students' motivation in addition to attracting students' interest in learning. Motivation can influence and encourage the level of use of digitalization practices among students (Aziah & Taufik, 2016). The effectiveness of digital learning implementation is shown when the student is willing to give full attention and follow the learning actively. Digital learning methods that use interactive media are characterized as methods that suit the needs of 21st-century teaching and learning (Becker et al., 2017). The results of these studies provide information that the main driver of behavior is student interest and motivation. Now the approach to the use of educational technology tools is not only emphasized to teachers but also students so that they can demonstrate the use of technology which leads to experiential learning, knowledge composition, and skill development.

Teaching approaches, methods, techniques, and materials for today's digital generation need to be different from those of previous teaching delivery. According to Prensky (2008), the current generation's style of processing information and thinking is much more forward-looking. This makes conventional approaches less suitable to be practiced following the content of lessons and the rapid development of technology. The learning by-design approach is one of the methods in learner-centered learning that is seen to have a positive impact on teachers' teaching pedagogy (Kalantzis & Cope, 2010). This was recognized by Resnick (2007) who stated that learning takes place effectively in a fun environment where students can build, shape and create through play. Additionally, intrinsic motivation and deep learning strategies can also be enhanced by this approach. This approach is also supported by the constructivism learning theory pioneered by Papert (1991) which states that learning becomes more meaningful when learners actively build their artifacts and share with others.

In addition, Mills and Smith (2011) also stated that students can build their knowledge during the design process. Bloom's Digital Taxonomy adapted by Churches (2008) puts their activities in the category of creation which is the highest level in students' thinking skills. In integrating digital gamification in the classroom, Mclester (2005) emphasizes that their activities are the best method. Teachers can use this convenience as a teaching aid by linking teaching content into the form of games (Ash, 2011). Teachers also play an important role in carrying out this activity in ensuring the learning objectives can be delivered well and effectively. Teachers need to ensure a balance of content, pedagogy, knowledge, and technology used.

Students' curiosity can pique and inspire by their active participation in the learning process through teaching using digital technology that combines many engaging features. The teaching process is made more engaging, capable of motivating students, and able to boost student knowledge of the concepts being presented through the use of digital technology-based learning (Omar et al., 2021). To boost students' interest and willingness to learn, teachers must comprehend, be aware of, and always be open to embracing changes in pedagogy. By doing this, they may provide students with engaging and effective teaching strategies (Iywon & Nasri, 2020).

Knowledge, Skills, Attitude (KSA) Competency Framework

The Knowledge, Skill, and Attitude competency theory was designed by Benjamin Bloom in 1956 at a conference session organized by the American Psychological Association. The committee produced three domains: (a) cognitive (knowledge), (b) psychomotor (skills), and (c) affective (attitude) often shortened by KSA (see **Table 1**). The KSA is derived from Bloom's taxonomy, which seeks to classify the levels of important behaviors in learning. Benjamin Bloom himself was the head of the educational psychology committee that designed the classification. The committee produced three main areas of educational activity, namely: cognitive: mental skills (knowledge); psychomotor: manual or physical skills (skills); affective: growth in feelings or emotional areas (attitude). The point is that the development process in any form including learning can improve a person's knowledge, skills, and attitudes to a certain degree according to its design. Knowledge is a theoretical and practical understanding of certain subjects. It contains a collection of information in the form of facts, procedures, or methods.

Table 1
Knowledge, Skills, and Attitude Defined

Dimension	Definition
Knowledge	Factual knowledge or information
Skills	Abilities or skills that require knowing how to do something; Application of knowledge
Attitudes	Values, interests, emotions, dispositions, character or attributes.

Based on the KSA Competency Framework (**see Figure 1**), knowledge means the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories, and practices that is related to a field of work or study. Skills are defined as the ability to apply knowledge and use know-how to complete well-defined tasks. Skills may be

cognitive or practical and attitude is a hypothetical construct that represents an individual's degree of like or dislike for a studied item. Attitudes are generally positive or negative views of a person, place, thing, or event.

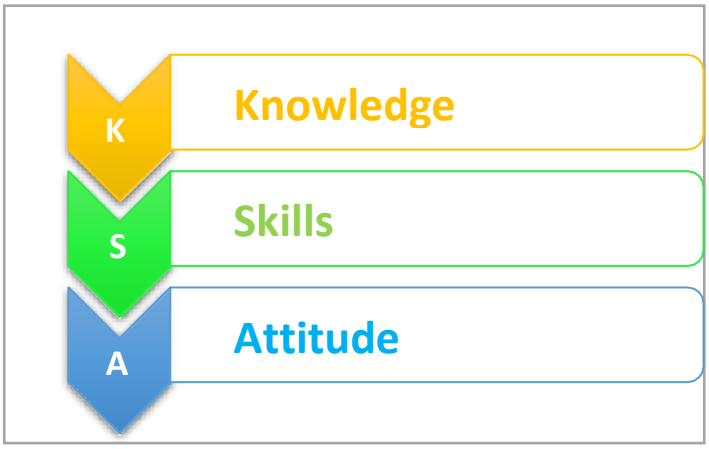

Figure 1. Knowledge, Skills, Ability (KSA) Competency Framework

Therefore, there were three objectives underpinning this research: (a) to identify the level of digital competency among secondary school students, (b) to investigate the relationships that exist among studied factors constructed to the research variable, and (c) to determine the relationship between digital competencies and motivation among students who enrolled Design and Technology subject. The study tested two variables to examine the relationship that exists **(see Figure 2).**

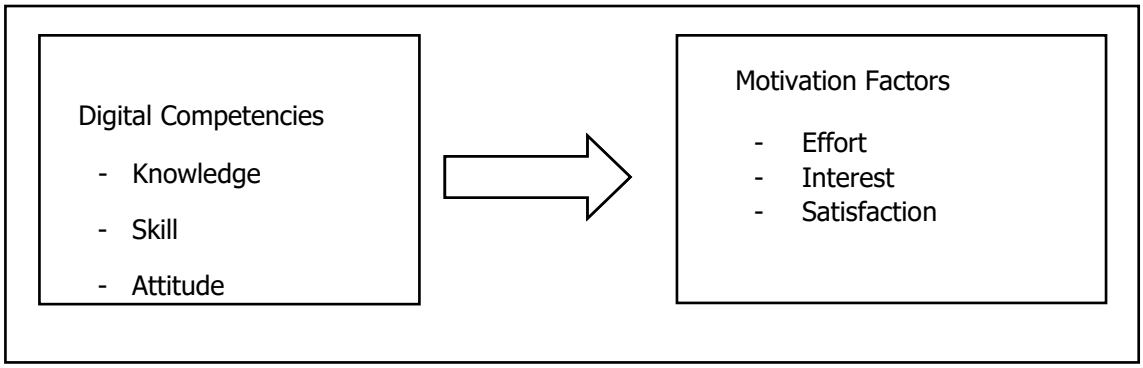

Figure 2. Conceptual framework

Methodology

A quantitative descriptive and correlational study was employed in this research. Two hundred and sixty students enrolled in the Design and Technology (D&T) subject from four selected secondary schools registered under the supervision of the Selangor District Education Office were selected as the study sample. A stratified random sampling technique was employed where subgroups within the sample size were drawn equally among selected schools. A set of questionnaires was self-developed consisting of 53 items and divided into three sections; (a) demographic profile of the respondents, (b) digital competency, and (c) motivation factors. Before the actual study, the questionnaire was validated by experts and

piloted involving 30 respondents who were excluded from the sample size. The reliability index of each measured construct is stated in **Table 2.** Respondents were given a period of approximately 10 to 20 minutes to answer the questionnaire. The item sets in the survey questionnaire were framed using a Likert Scale as the respondents' feedback options. For this Likert scale, respondents only need to express their level of agreement by indicating their answer choices based on the directions and scale descriptions stated at the beginning of the questionnaire.

Table 2
Reliability Test of the studied constructs

Variable	Construct	Cronbach's Alpha	No of Items
Digital Competency	Knowledge	.748	8
	Skill	.798	8
	Attitude	.754	8
Motivation Factor	Effort	.801	8
	Interest	.777	8
	Satisfaction	.764	8

To facilitate the data collection process, the researcher presented to the Ministry of Education Malaysia's (MOE) Education Planning, Research and Policy Division (eRAS 2.0) letters of authenticity, the Selangor State Department of Education's (SSDOE) letter of approval, and University Putra Malaysia's (UPM) letter of identification to the participants.

Research Findings

Table 3 reports the distribution of respondent's demographic by gender, race, and school location. The respondents of this study were as many as 260. It was perceived that the response rate is 100%. The result of the study found that male respondents 131 people (50.4%) while female respondents were 129 people (49.6%). Meanwhile, 226 students (86.9%) were Malay, 8 students (3.1%) were Chinese and 26 students (10%) were Indian. From this result, it can be noted that the number of Malay students dominated the population assuming demographic location comprises the majority of Malay residents. The school category, on the other hand, has an equal distribution number of respondents; 65 students from each school.

Table 3
Demographic findings

Demographic	Characteristic	Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	131	50.4	50.4	50.4
	Female	129	49.6	49.6	100.0
Race	Malay	226	86.9	86.9	86.9
	Chinese	8	3.1	3.1	90.0
	Indian	26	10.0	10.0	100.0
School	SMKS 2	65	25.0	25.0	25.0
	SMKS 7	65	25.0	25.0	50.0
	SMKS 16	65	25.0	25.0	75.0
	SMKS 24	65	25.0	25.0	100.0

Descriptive analysis of knowledge competency on digital application

Table 4 describes the level of students' knowledge competency in using a digital application. The highest mean score in this table is 4.43 “Students frequently communicate with their friends through digital applications like Instagram, Twitter, and TikTok”. The lowest mean score is 4.18 where there are students who lack competency in knowledge to “download and upload materials in digital applications for learning purposes”. In summary, the data shows that students are knowledgeable about using digital applications, however, some students lack the skill in downloading and uploading materials in digital applications for learning purposes.

Table 4
Knowledge competency

Item	Mean	Std. Deviation	Level
I have a high skill level and good knowledge of using digital application.	4.27	.45	Very High
I use competency in digital applications in learning to make referrals.	4.30	.56	Very High
I often use information from the Internet through digital learning.	4.28	.47	Very High
Competency of digital application in education help me a lot to get information.	4.42	.52	Very High
I have used download and upload materials in digital applications for learning purposes.	4.18	.58	High
I have used gamification and quiz through a digital application.	4.26	.54	Very High

I frequently communicate with my friends through competent digital applications like Instagram, Twitter and TikTok.	4.43	.53	Very High
I know how to use the information from the competency of digital applications to enhance my knowledge and learning.	4.30	.46	Very High

Descriptive Analysis of Skill Competency in Digital Application

Table 5 shows the skill competency level of students in using a digital application. From this table, the highest mean score is 4.45 which shows that students are adept at being able to answer quizzes through applications like Quizizz and Kahoot. The lowest mean score is 4.02 where students are less skilled to assess when it is appropriate to use digital applications in learning. The results of the study show that students are skillful in using digital applications however some students are lacking in the skill to assess when it is appropriate to use digital applications in learning.

Table 5
Skill competency

Item	Mean	Std. Deviation	Level
I know how to use e-learning to share information with friends and teachers.	4.14	.55	High
I can use a variety of applications such as Quizizz World Wall and Tinkercad in the learning process of Design and Technology subjects.	4.24	.52	Very High
I know how to assess when it is appropriate to use digital application in learning.	4.02	.64	High
I can seek out new technology learning opportunities to improve my knowledge and proficiency.	4.19	.55	High
I can build my slides for individual or group presentation purposes.	4.22	.62	Very High
I know how to answer quizzes through an application like Quizizz and Kahoot.	4.45	.54	Very High

I can build and develop learning activities that can integrate my knowledge through e-learning whether inside or outside the classroom.	4.08	.57	High
I can use the competency of digital application in-class assignments and collaborate on assignments using the internet.	4.41	.48	High

Descriptive analysis of attitude competency on digital application

Table 6 shows the level of students' attitudes toward using digital applications. Based on the table, the highest mean score is 4.54 where students have an attitude of believing that "Twitter, Blog, and TikTok provide a space for people to share information and opinion, but it must be used in the right way". The lowest mean score in this table was 4.17 where students have less attitude towards using Instagram as a communication tool. Even so, the results indicated that students tend to have the attitude to use Twitter, Blog, and TikTok apps to share information and opinions in the right way but students are less inclined towards the attitude of using Instagram as their main communication tool.

Table 6
Attitude competency

Item	Mean	Std. Deviation	Level
Twitter, Blog, and TikTok provide a space for people to share information and opinions, but they must be used in the right way.	4.54	.50	Very High
Instagram is best used as a communication tool.	4.17	.48	High
The capabilities in digital learning that I find now are very easy to learn and I am interested in learning new technologies.	4.24	.44	Very High
Information obtained through digital learning is not necessarily accurate, especially in other people's blogs.	4.30	.47	Very High
Digital applications in education help with the learning of my Design and Technology subjects.	4.30	.51	Very High
Digitalization is an interesting teaching and learning material in the classroom.	4.30	.47	Very High

Most of the competencies of digital applications introduced can enhance the learning methods of my Design and Technology subjects.	4.19	.48	High
The use of the competency of digital applications can replace textbooks in the classroom.	4.36	.48	Very High

Descriptive analysis of students' effort as a motivation factor in digital application

Table 7 describes the effort as a motivational factor for students in using digital applications. Based on the table, the highest mean score is 4.37 where students make an effort to use digital applications by always thinking from various perspectives about the benefits of using them in learning. The lowest mean score is 4.20 where students make less effort to get a positive response toward learning Design and Technology subjects that use various kinds of applications. Therefore, the study found that students are highly in efforts to use the competency of digital application by always thinking from various perspectives of the benefits but some students are less in efforts to get a positive response to learning Design and Technology subjects that use various digital applications.

Table 7
Students' level of effort

Item	Mean	Std. Deviation	Level
I try to be good at mastering and understanding the use of digital applications that I use in learning.	4.23	.44	Very High
I actively engage in learning activities that involve the use of digital or technology application	4.21	.54	Very High
I will have a positive response to learning Design and Technology subjects that use various digital application.	4.20	.45	Very High
I will adapt myself through digital-based learning using various technologies in the classroom	4.31	.49	Very High
I always think from various perspectives about the benefits of using competent digital applications in learning.	4.37	.52	Very High

I will help other friends to increase their understanding and interest in the use of digital application in lessons.	4.30	.48	Very High
I complete the exercise questions on the Quizlet application for Design and Technology subjects within the set period.	4.23	.42	Very High
I act as a leader to help friends who are not quite clear to use the competency of digital applications in learning.	4.25	.46	Very High

Descriptive analysis of students' interest as motivation factor in digital application

Table 8 shows interest as a motivational factor for students to use digital applications. As seen in the table, the highest mean score is 4.50 where students achieve interest in using the competency of the digital application when they can complete their assignments in learning activities with technology. The lowest mean score is 4.29 where the conveniences applied in the competency of digital application are less likely to reach the interest of students in Design and Technology subjects. The study revealed that students are very interested in using digital applications when they can complete assignments in learning activities using technology but the conveniences in the competency of digital application are less to reach the interest of students in Design and Technology subjects.

Table 8
Students' level of interest

Item	Mean	Std. Deviation	Level
I am interested in learning new techniques and skills available in digital applications.	4.42	.50	Very High
I do not feel shy to ask my teacher how to use the competency of digital applications introduced during the lesson.	4.40	.52	Very High
I always get encouragement from my teacher in learning to use technology.	4.39	.49	Very High
I feel happy when I can complete assignments in learning activities using technology.	4.50	.51	Very High
The conveniences used in digital based learning increases my interest in Design and Technology subjects.	4.29	.49	Very High

I find it easy to use any digital application while doing schoolwork.	4.35	.49	Very High
I feel energized by the learning that uses various digital technologies.	4.33	.50	Very High
I am always interested in learning with attractive teaching materials.	4.31	.47	Very High

Descriptive Analysis of Students' Satisfaction as a motivation factor in digital application

Table 9 depicts satisfaction as a motivational factor for students in using a digital application. As shown in the table, the highest mean score is 4.38 where students achieve satisfaction in using digital applications when they enjoy learning seriously to find out something new. The lowest mean score is also found to be 4.26 where students achieve less satisfaction when they do not understand the operation of competency of digital applications so they do not look for solutions. Hence, the study found that students achieve satisfaction using digital applications when they enjoy learning seriously to find out something new but students achieve less satisfaction when they do not understand the operation of a digital application.

Table 9
Students' level of satisfaction

Item	**Mean**	**Std. Deviation**	**Level**
I get satisfaction when learning activities are done using technology.	4.27	.50	Very High
I like the more challenging nature of the competency of digital applications in learning.	4.27	.49	Very High
When I do not understand the operation of a digital application, I like to look for the appropriate solution.	4.26	.47	Very High
I use competency in digital applications because it can find out many things that I want to know.	4.35	.48	Very High
I enjoy learning seriously to find out something new.	4.38	.49	Very High
I like to use a variety of competencies of digital applications in learning because it gives me more satisfaction.	4.34	.48	Very High
I feel happy if learning using competency of digital applications and technology goes smoothly.	4.37	.49	Very High

Learning activities using the competency of digital application requires me to think very carefully to finish it.	4.35	.49	Very High

Correlation Analysis Between Selected Factors of Digital Competencies and Motivation

Table 10 explains the result of the relationship using the Pearson Correlation test. The result shows that the *p*-value (sig.) for the relationship between knowledge and motivation was *r*=.499 which indicates a moderate relationship between the independent variable and dependent variable. The result also shows that the *p*-value (sig.) for the relationship between skill and motivation was *r*=.408 which indicates a moderate relationship between the independent variable and dependent variable. The table also reported the *p*-value (sig.) for the relationship between attitude and motivation was *r*=.742 which indicates a strong relationship between the independent variable and dependent variable. Overall, the results indicate that a positive relationship exists significantly between each of the digital competency variables and motivation.

Table 10
The relationship between digital competencies and motivation

Digital Competency Variable		Motivation
Knowledge	Pearson Correlation	.499**
	Sig. (2-tailed)	<.001
Skill	Pearson Correlation	.408**
	Sig. (2-tailed)	<.001
Attitude	Pearson Correlation	.742**
	Sig. (2-tailed)	<.001
	N	260

Relationship of Knowledge on Effort, Interest, and Satisfaction

Table 11 describes the result of relationship investigations using the Pearson Correlation test. The result shows that the *p*-value (sig.) for the relationship between knowledge and effort was *r*=.334 which indicates a weak relationship between the independent variable and dependent variable. The *p*-value (sig.) of the relationship between knowledge and interest was *r*=.412 which indicates a moderate relationship. Moreover, the result also reported that the *p*-value (sig.) of the relationship between knowledge and satisfaction was *r*=.564 which indicates a moderate relationship. Therefore, the results show that a relationship exists significantly between knowledge as an independent variable towards effort, interest, and satisfaction as dependent variables.

The relationships among skill and effort, skill and interest, and skill and satisfaction were analyzed using Pearson Correlation. The *p*-value (sig.) for the relationship between skill and effort was at *r*=.319 which indicates weak. Besides, the result also shows that the *p*-value (sig.) for the relationship between skill and interest was at r=.364 which indicates a weak relationship. Furthermore, the result shows that the p-value (sig.) for the relationship between skill and satisfaction was r=.397 which indicates a weak relationship. Overall, it may

be said the results show that there is a significant relationship between skill as an independent variable towards effort, interest, and satisfaction as the dependent variable.

The result of the relationship between attitude and effort, attitude and interest, and attitude and satisfaction were also investigated. The result shows that the *p*-value (sig.) of the relationship between attitude and effort was *r*=.631 which indicates a moderate relationship. Similarly, a moderate relationship was also found between attitude and interest with *r*=.668. Just the same, a moderate relationship between attitude and satisfaction was indicated at *r*=.670. All in all, the relationship exists significantly among the studied variables.

Table 11
Relationship between knowledge and selected variables

Digital Competency Variable		**Effort**	**Interest**	**Satisfaction**
Knowledge	Pearson Correlation	.334**	.412**	.564**
	Sig. (2-tailed)	<.001	<.001	<.001
Skill	Pearson Correlation	.319**	.364**	.397**
	Sig. (2-tailed)	<.001	<.001	<.001
Attitude	Pearson Correlation	.631**	.668**	.670**
	Sig. (2-tailed)	<.001	<.001	<.001
	N	260	260	260

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation Analysis Between Digital Competencies and Motivation

Table 12 shows the result of the relationship using the Pearson Correlation test. The result shows that the *p*-value (sig.) for the relationship between digital competencies and motivation among secondary school students was *r*=.643 which indicates a moderate relationship between each independent variable and dependent variable. Therefore, the results conclude that a relationship exists significantly between the independent variables (knowledge, skill, and attitude) and dependent variables (effort, interest, and satisfaction).

Table 12
Relationship between digital competencies and motivation

		Digital Competency	Motivational Factors
Digital Competency	Pearson Correlation	1	.643**
	Sig. (2-tailed)		<.001
	N	260	260
Motivation	Pearson Correlation	.643**	1
	Sig. (2-tailed)	<.001	
	N	260	260

**. Correlation is significant at the 0.01 level (2-tailed).

Discussion

Learning is a process that helps an individual grow their physical, intellectual, emotional, and social traits to increase their knowledge and skills (Ishak et al., 2022). For students to grasp learning utilizing digital applications, which is beneficial for students in the future, several elements need to be addressed. The research also shows that students generally have a favorable attitude toward using digital applications. This indicates that students might embrace using digital learning as a substitute for obtaining more materials for their coursework.

Also, incorporating technological components into the teaching and learning process can boost students' willingness to keep studying (Aljaraideh et al., 2020). This is because incorporating technology into educational activities through digital applications makes learning more enjoyable by fostering an environment conducive to collaboration, engagement, and student autonomy. According to Kiuru et al (2020), ICT and technology learning settings promote students' autonomy and active interaction, which in turn boosts motivation to study.

The findings also indicate that several significant variables affect how effectively students use digital applications in their learning. The interest element, or the desire to use ICT, is one of the primary reasons why students use technology in their education. This claim that using technology in teaching and learning helps pique students' interest in learning (Bennett et al., 2015). Because of this, the integration of ICT into teaching and learning can increase student interest. In reality, using ICT allows professors to do more easily and direct students. The students are always willing to take chances when studying through digital applications since they have a high level of curiosity. Students were found to feel comfortable in learning by using ICT and do not want to be outdated in the use of digital learning is a factor that encourages them to use this digital application.

Hence, level and motivating variables are the largest influences on students' understanding of learning through the usage of digital applications (Juliantari et al., 2018). The result is consistent with the results of the study by Mun et al (2019), which espoused that the learning environment through the use of digital applications has the highest perception of use among students. Digital applications like "google classroom" have directly or indirectly supported the

results of this study. Consequently, through implementing supportive and efficient learning and education processes in Design and Technology topics, the usage of digital applications plays a significant role in generating and growing motivation among students.

Attitudes can be formed based on both personal experiences and the environmental background in which students are raised. The highest mean recorded was students having a positive attitude towards the belief that various digital applications provide a space for people to share information and opinions, but must be used in the right way. This may be because today's students are beginning to understand the importance of using technology in education now and in the future. It was also found that students showed a positive attitude that they felt that digital applications in education helped their learning of Design and Technology subjects. Here we can see that attitude is a major aspect that motivates students to be inclined toward the use of digital apps in their teaching and learning.

In this situation, a teacher plays a crucial role in transforming the way that teaching and learning take place to keep up with the pace of the 21st-century learning milieu and the usage of digital technology in the classroom. This viewpoint is reinforced by Raman et al. (2019), who said that strategic planning on digitalization shall empower teachers to govern the whole ecosystem. Students will constantly be encouraged to use digital learning tools, which offer several benefits. Before exposing students to digitalization programs, teachers must, however, gain proficiency with them.

Overall, digitalization is critical for students to succeed in today's digital age. By leveraging digital technologies and processes, students can enhance their learning experiences, develop essential digital skills, and prepare themselves for the demands of the future workforce. On another note, through digitalization, students can develop digital skills that are essential in today's job market. These skills include the ability to use digital tools and software, navigate online platforms, and analyze digital data. By embracing digitalization, students can gain a competitive edge and increase their employability.

Conclusion

With the trivial challenges of the COVID-19 pandemic, the study demonstrated that the respondents were coping quite well in the learning process when it comes to digitization in education. The findings also reported it was students coping with challenges with digitization and motivation on using technology has indeed produced meaningful learning no matter how struggled they were in the current learning ecosystem. This conclusion can be drawn based on population characteristics which are mostly living in urban areas and having stable economic well-being. Lack of capability and competency in digitalization practice would debilitate students to the point where few cases reported could not continue in learning due to impulsive necessity in purchasing the devices and access to technology. This scenario may trigger future studies on different population characteristics and dynamic coping factors. Hence, future research is recommended on investigating the influence and relationship of selected constructs as stated in the digital competence framework for citizens published by the European Commission or other relevant frameworks which are being studied concurrently.

The findings established the role of digital competencies comprises knowledge, skill and attitude as primal contribution to motivate students digitalization efforts. These constructs include cognitive: mental skills (knowledge); psychomotor: manual or physical skills (skills); affective: growth in feelings or emotional areas (attitude) are prominent to warrant students'

motivation in digital world. Notably, the myriad of technologies offered and optimized at school would be less used by students if they lack of knowledge, skill and attitude towards learning modalities as mentioned. This will contribute to voracious waste although huge investment has been put in place with great intention.

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