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Students' Contextualization on Technology Use in Learning

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Abstract

This research determines the level of agreement of learners on technology use as a tutor and as a learning tool. It also discussed how the constructivist theory supports the two domains of technology use as a tutor and as a learning tool. A questionnaire was used in this descriptive research. Pilot testing was performed before real information collection involving 112 learners registered from Gulf Medical University, Ajman, UAE medical departments. The answers for Cronbach's tau-equivalent reliability were calculated using SPSS AMOS software version 23. It was discovered that the coefficient of reliability was 0.71. This value falls into an acceptable category. The real collection of information used purposeful sampling involving 138 learners of medical imaging. A six-point Likert scale has been used to categorize the two primary factors; technology as a tutor and as a learning tool. The results were presented as weighted mean values. Technology as a tutor is a useful and efficient educational instrument for learners with different abilities. They agreed heavily on its use. Besides technology as a learning tool fosters cooperation among students. In the same instance, it motivates learners to participate more in learning operations. They are very much in agreement with this domain. The constructivist theory supports that learning takes place when learners are actively involved in classroom activities and other locations conducive to them. Then learning is backed up for a lifetime by real-life experiences.

Keywords: Constructivist Theory; Students' Contextualization; Technology as a Learning Tool; Technology as a Tutor.

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1. Introduction

The teaching-learning technique in schools in the 21st century is changing with the incorporation of instructional technology. Educators and teachers unanimously agreed that this technology offers several benefits in knowledge acquisition. It has resulted in a change in the way the educational structure conducts teaching and learning [1]. Complicated issues were acknowledged that there is a need for adequate modifications in educational institutions and more participatory and student-centered pedagogical models [2]. Adequate procedures and methodologies to ensure that these methods are used efficiently as actual support tools in the teaching-learning process are crucial for accomplishment. Free access to these technological resources and educational opportunities will contribute to the quality of the education of society. Recently, all organizations have created extensive global attempts to attain this goal, although each nation has a particular method of conceptualizing and embracing technological change [3, 4]. A constructivist approach was a theoretical underpinning used in this study similar to a model described by the author [5]. The model shows that learning is an active technique, and learning is more effective when learners are engaged in relevant exercises that are personally important. In his research on teacher education in social studies, Molebash [6] found support for using this model, arguing that "a constructivist approach is a consistent theme among methods of course success stories of technology inclusion" [6, p. 415].

Technology should be used as a knowledge construction tool that amplifies learners' abilities to construct knowledge for themselves rather than being taught by pre-programmed lessons. Learners learn with technology, not from it, through meaningful activities. According to the authors, [7] students learn with technology, such as computers used as cognitive tools, which the authors remark as mind-tools. To summarize, the authors argue that by using technology as mind-tools, students can further develop their creative, analytical, critical, problem-solving, decision-making, reasoning, intuitive, and self-regulating faculties. In this respect, when constructively used, technology can lead to the education of a more intellectual and competent generation of learners. An example of a mind-tool is a concept or semantic map, which helps learners spatially understand complex matters and see the relations amongst different elements of the object under examination. Henceforth, by confirming its use in learning modalities as endorsed by prior research, the scientists examined the fields of technology use as a tutor and as a learning tool. Similarly, this research promotes the constructivism theory for learners through autonomous learning. The research results in the assertion that the learners prefer independence in the development of understanding and the preference for autonomy based on their powerful agreement on the use of technology as a tutor and as a teaching device. This is a useful input to create learner-centered operations for educators.

1.1. Objectives

As part of the process of embracing technological changes in the learning process, this research delved on the following objectives: {1) Determine the level of agreement of learners on technology use as a tutor. (2) Determine the level of agreement of learners on technology use as a learning tool. (3) Discuss how the constructivist theory supports the two domains of technology use as a tutor and as a learning tool.

2. Methodology

Descriptive research with quantitative data was used. The survey provides two fundamental features that differentiate it from the remaining data collection techniques: it gathers information supplied by the respondents by writing through a structured questionnaire and utilized samples from the population engaged in the research. The study was conducted among students of the Medical University Department of Imaging, College of Health Science, Gulf Medical University, Ajman, UAE. Their participation was voluntary and complete anonymity was observed in the interpretation of data. The questionnaire adopted was from the Socrative Program Technology in the classroom. The items of this questionnaire which were classified by the researchers for the student-respondents are technology as a tutor and technology as a learning tool. The questionnaire was completed in consultation with two measurement and assessment specialists, each of whom validated the measure's goal-based content and issues. It revealed that the coefficient of reliability was 0.71. George and Mallery [8] provide the following rules of thumb "_ > .9 – Excellent, _ > .8 – Good, _ > .7 – Acceptable, _ > .6 – Questionable, _ > .5 – Poor, and_ < .5 – Unacceptable" [8, p. 231]. The guide for scoring for the weighted mean computation is shown in Table 1.

Table 1: Interpretation Guide

Range of Weighted Mean Values	Interpretation
5.17 – 6.0 (6)	Strongly Agree (SA)
4.33 – 5.16 (5)	Moderately Agree
3.50 – 4.32 (4)	Slightly Agree
2.67 – 3.49 (3)	Slightly Disagree
1.84 – 2.66 (2)	Moderately Disagree
1 – 1.83 (1)	Strongly Disagree

3. Result and Discussion

The major concern of the results in this research is the two domains of technology as a tutor and as a learning tool.

3.1. Technology as a Tutor

Table 2: Technology as a Tutor

Domains of Educational Technology (Technology as a Tutor)	Weighted Mean	Interpretation
1. Increases academic achievement (e.g. grades).	5.95	Strongly Agree
2. Is effective because I believe I can implement it successfully.	5.78	Strongly Agree
3. Is a valuable instructional tool.	6.00	Strongly Agree
4 Is an effective tool for students of all abilities.	6.00	Strongly Agree
5. Is unnecessary because students will learn this skill on their own, outside of campus.* (*reverse interpretation)	1.05 (*5.95)	Strongly Disagree
6. Increases the amount of stress and anxiety on students' experience.* (*reverse interpretation)	1.00 (*6.00)	Strongly Disagree
Overall Interpretation	5.94	Strongly Agree

Various researches support this domain of technology. Table 2 shows the result of technology as a tutor.

The respondents asserted that technology *increases academic achievement (e.g. grades*). These results are compatible with other researches that demonstrate the positive impact of technology on enhancing student achievement which is important improvements in all areas [9] – [12]. The participants also revealed that *technology is effective because they believe they can implement it successfully.* These respondents' point of view agreed with the result of the study of the group of researchers. Hawkins and his colleagues [13]. ET can have the greatest impact on enhancing student learning and achieving measurable educational objectives. Technology enables students to become autonomous learners [14]. Also, *technology is a valuable instructional tool.* It can also empower teachers and students, turn teaching and learning processes from highly teacher-dominated to student-centered [15]. Similarly, *technology is an effective tool for students of all abilities.* These findings are related to a common belief that ET can enhance the practice of teaching and learning [15]. The statement *that technology is unnecessary because students will learn this skill on their own, outside of campus* was reversely scored. Effective technology empowers learners and helps them assume responsibility for their learning according to the two experts [16]. Finally, there is another argument that *technology increases the amount of stress and anxiety on students' experience.* In interpreting this declaration, reverse scoring was used. The main significance of using technology as a tutor is its convenient, learning-friendly contribution to individual users. Deductively, the respondents strongly agreed on using technology as a tutor.

3.2. Technology as a Learning Tool

In this section, concepts from various authors using technology as a learning device were discussed to support the study results which is presented in Table 3. As manifested by the respondents, technology *promotes student collaboration*.

Table 3: Technology as a Learning Tool

Domains of Educational Technology (Technology as a learning tool)	Weighted Mean	Interpretation
1. Promotes student collaboration.	6.00	Strongly Agree
2. Promotes the development of communication skills.	5.89	Strongly Agree
3. Demands that too much time be spent on technical problems.* (*reverse interpretation)	1.0 (6.0)	Strongly Disagree
4. Enhances my professional development.	5.92	Strongly Agree
5. Is effective if teachers participate.	5.57	Strongly Agree
6. Helps accommodate students' personal learning styles.	4.55	Moderately Agree
7. Motivates students to get more involved in learning activities.	6.0	Strongly Agree
8. Requires software-skills training that is too time-consuming.* (*reverse interpretation)	1.0 (6.0)	Strongly Disagree
9. Promotes the development of students' interpersonal skills (e.g., ability to relate or work with others).	4.47	Moderately Agree
Overall Interpretation	5.60	Strongly Agree

While surveys generally encourage collaboration for better student outcomes, this finding is at best tentative given the lack of research representing a variety of study designs and cooperative models [17]. Therefore,

technology *encourages communication skills growth*. Information and communication technology has developed a global enterprise for schooling [18]. On the other hand, the *respondents opposed that technology demands that too much time be spent on technical problems*. Recent techniques are user-friendly.

User-friendly relates to anything that makes the use of a computer simpler for novices. Looking back to technology, *it enhances professional development.* This finding confirms the elements of promoting learning. These components include an active and social environment, in which change, transfer, and metacognition are encouraged. Especially essential is the role of collaboration in professional development [19] – [22]. Conversely, *technology is effective if teachers participate*. Teachers, as well as professional designers, often find themselves using instructional methods that could fall into either conception of learning; sometimes conveying ideas, assisting learners to create new ideas. Also, the respondents moderately agreed that *technology helps accommodate students' learning styles*. This is a private way in which each process the data, assimilates it separately and carries out structures individually [23]. Another strong feature of technology is it *motivates students to get more involved in learning activities*. Under circumstances where educators are separately comfortable and at least somewhat qualified in using personal computers (pc), where students are given time to use pcs as part of school assignments, where equipment is accessible and convenient to enable computer operations to run smoothly alongside other teaching tasks, and where teachers support a student-centered, constructivist pedagogy involving partly student-defined cooperative projects, computers become a valuable and well-functioning instructional tool [24]. The statement that *technology requires software-skills training that is too time-consuming was strongly disagreed by them*. Domínguez and Jaime [25] looked at another teaching technique called an active method for learning database design by creating practical tasks by student teams in a face-to-face course. This method integrates project-based learning and project management techniques and tools. This means that it does not necessarily need software skills training. On the other hand, the result of the study showed a moderate agreement on the statement that technology *promotes the development of students' interpersonal skills* (e.g., ability to relate or work with others). Interpersonal skills are hampered with the use of technology.

3.3. Constructivist theory supports the two domains of technology use as a tutor and as a learning tool

The learning theory of constructivism is a philosophy that promotes the logical and intellectual development of students. The underlying concept in the theory of learning constructivism is the role that experiences or connections in student education with the adjacent atmosphere play. The theory of learning constructivism argues that people generate information based on their experiences and shape context. Accommodation and assimilation are two of the key concepts within the constructivism learning theory that facilitate the construction of the new knowledge of a person. Assimilation causes a person to incorporate new experiences into the old experiences. This allows the person to develop new viewpoints, reconsider what once were misunderstandings, and assess what is relevant and ultimately change their perceptions. On the other side, accommodation reframes the environment and new experiences into the already existing mental capacity. Individuals conceive in a specific way the world works in. The constructivism learning philosophy promotes that students should be exposed to data, primary sources, and the ability to interact with other students so that they can learn from the integration of their experiences instead of making the students rely on the information of someone else and

accept it as reality. The experience in the classroom should be an invitation to a myriad of different experiences and the learning experience that allows the different backgrounds to come together to discuss and evaluate information and ideas. The philosophy of constructivism should allow learners at any age to develop the skills and trust to examine the world around them, create solutions or help for emerging problems, and then explain their words and actions, while inspiring those around them to do the same and acknowledging differences of opinion for the contributions they can make to the whole world. Classroom constructivism applications support the learning philosophy that builds the understanding of students and teachers.

4. Conclusion

The use of technology allows and enhances learning for people of all backgrounds at all levels in all locations. From the automation of the E-rate to the proliferation and acceptance of publicly licensed educational resources, the key pieces needed to make the most of the changes that technology makes possible in education are in place. Although the role of technology does not provide equality and accessibility in learning, in previously impossible ways, it can lower barriers to both. Regardless of the learners' perceived skill or geographic locations, all of them may access opportunities, perspectives, preparation methods, and knowledge that can set them to gain expertise in their chosen field of discipline. The constructivist assumption is that people learn from experiencing the object of analysis, whatever it may be, interpreting about it, reasoning about it, and reflecting on it as a result of independent learning. There are five interdependent characteristics of meaningful learning in the constructivist model that are productive, positive, deliberate, real, and cooperative learning process development. Presumably, it is important to use technology to support these learning attributes.

5. Recommendations

Integrating technology into the classroom is an important way to connect all learning styles with students. Educational incorporation of technology helps students stay engaged. It places great emphasis on instruction for students on technological knowledge, pedagogical knowledge and content knowledge (TPACK). The current collaborative efforts of teachers, educational technology experts, school administrators, researchers, and educational software staff will involve technology incorporation in the classroom. Luckily, there will be enormous returns on the savings to schools, teachers, and students. Hence, technology utilization contributes to the well-rounded development of the learners. With these, it is recommended to be prioritized by school authorities to address the linguistic, naturalist, musical or rhythmic, kinesthetic, visual or spatial, logical or mathematical, interpersonal, and intrapersonal learners.

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