

Information and Communication Technology Based Learning: Efforts to Improve Student Digital Literacy

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Abstract

The rapid increase of knowledge transfers and technology advancement has been global phenomena lately. This, then, can be incredibly important to students as digital natives to have digital literacy competences to conduct their activities. Nowadays, students have high awareness that digital literacy skills are completely crucial to ensure the understanding of digital technologies and information management for their learning, working, and living in digital society.

This look at is used to increase a getting to know framework in developing digital literacy abilities to enhance college students' capabilities in a digital society. Experimental research approach with pre-test and post-test models with a manage organization wherein the impact of the statistics and communication technology (ICT) studying version on the extent of virtual literacy of college students majoring in out-of-faculty education. The population in this look at included all students majoring in out-of-faculty education at the Universitas Negeri Padang and the use of random cluster sampling 86 college students have been selected and placed into two experimental agencies and a manage institution.

Based entirely on the outcomes of the effectiveness check data, that the significance value (2-tailed) is $0.000 < 0.05$, it is possible to conclude that when remedy, there is a significant distinction between the comparison of the digital literacy stage of students in the manipulate magnificence and the experimental magnificence. As a result, experimental elegance students who use a records and conversation technology-based curriculum have greater virtual literacy abilities than students in the manipulate class who use traditional learning. Facts and verbal exchange era-based learning can engage and empower students with studying stories, which is very important to deal with rapid virtual generation. Facts transition encourages people to acquire higher and more relevant skills in society, as well as to increase productivity.

Keywords: Information and Communication Technology, Learning, Digital Literacy

Introduction

Cyber way of life and using era allow new approaches to hook up with different people and hook up with information. in addition, due to the fact era is dynamic and constantly converting, college students are required to replace their information and talents on an ongoing foundation (e.g. OECD, 2015). With the speedy growth in information switch and technological range becoming a global phenomenon, it's miles vital for college students to have the digital literacy competencies predicted of digital natives, to perform responsibilities successfully in an expertise-based society and digital era." Digitally literate students can use technology advantageously to find and analyze the information, join and collaborate with everyone, produce and share content, and then use the internet and technology to advantage a variation of educational and professional goals.

Turning into a digitally literate student within the age of knowledge is a huge enough project for twenty first century college students. Of route, modern college students need to exchange their ideals about what virtual literacy way to cope with the main shifts from a technology and information-driven culture. Literacy literacy has advanced from having the competence to get entry to, examine and apprehend static printed texts to being capable of access, find, evaluate, recognize and make use of the dynamically rich diversity of digital texts available over the internet. although it is assumed that students are now digitally literate and skilled in getting access to and the usage of the net and generation in famous, they appear to be challenged through the ability to recognize the accuracy and trustworthiness of the information they access on-line (e.g. Theron et al, 2017). Cutting-edge college students want to understand that virtual literacy is needed to ensure open-mindedness to technology and characteristic the competence to govern to be had facts.

Primarily based on observations made in elegance, the modern learning process is constrained to mastery of material and tends to ignore the substance of digital literacy skills and getting to know methods that could boom scholar motivation in making use of virtual media in studying. This is in keeping with the dearth of use of internet facilities and virtual media both owned with the aid of students and people available on campus. Weak digital literacy talents of students can be visible from the lack of information and ability to navigate valid virtual material content material sources, aren't acquainted with communicating with expert professionals to guide learning, and innovate in locating new ideas in completing assignments (e.g. Rayendra et al, 2020).

This study will make a significant contribution to the improvement of a getting to know framework in developing digital literacy competencies to improve students' skills in a digital society. The findings from this take a look at will further assist educators and coverage makers to make sure the excellent technique needed to improve college students' virtual literacy skills to be able to access and system information correctly for instructional desires and, ultimately, for employment improvement purposes. This study will make a sizeable contribution to the development of a digital literacy training framework to improve students' competencies in a digital society.

Materials and Methods

Materials

ICT in education

Information and communication technology collects, organizes, stores, publishes, and uses data in the form of images, message, numbers, and other information using computer systems (e.g. Hopson, 1998). Consistent with cognitive and constructivist perspectives, ICT is a mastering device that can provide some learning activities, ranging from tutoring to simulations. Information and communication technology (ICT) is not a fully defined academic challenge in the same way that records, mathematics, or literature are; it has not yet secured a domain in the public faculty curriculum in the same way that other fields of study have. Hardware, software, networks, and media for collecting, storing, processing, conveying, and giving information (audio, facts, text, and photographs), as well as related services, are all part of information and communication technology. Information and communication infrastructure (ICI) and information technology (IT) are the two components of ICT. The former focuses on physical telecommunications frameworks and connections (cell, audio, mail, radio, and television), even if the latter refers to data collection, backup, processing, and presentation hardware and software (e.g. Sarkar, 2012). There could be a variety of explanations put forward to explain this, such as ICT being a new instructional challenge or ICT being a coaching and learning device. Different study methods define ICT in different ways. For the objectivist method, ICT is a new situation depend, a new skill that students want to learn.

One of the most critical aspects of future education is preparing students to enter a digital age in which expertise is now the most valuable commodity for social and economic growth and shared skills and interconnected activities define the types of evolving jobs. To address these new challenges, educational institutions must employ pedagogical methods. New information and communication technologies (ICTs) can play an important role in these developments even before they are properly taught and used as a tool for public consolidation of the teaching and learning process, assisting in the development of students' teamwork and productive knowledge-working skills. Such abilities have an impact that extends beyond the technical and academic realms. The ability to resolve increasingly complex issues in a variety of information-rich domain names, participate in know-how work, and interact in a variety of networking activities are among the skills required in our expanding society.

Digital Literacy

The abilities required to live, learn, and work in a digital society are referred to as digital literacy. Working as a community educator usually requires strong digital skills. Students who are digitally literate can use technology to gather and evaluate information, connect and collaborate with others, share content, and use online technology to achieve a variety of personal, academic, and professional goals. As a result, digital literacy enables people to live, learn, work, participate, and thrive in a digital society, and it is an essential skill for today's educators. Media literacy, statistics literacy, digital understanding, skill acquisition, conversation and collaboration, career and identity management, and IT literacy are all context-based digital literacy models (e.g. Jisc, 2014). The three key dimensions of digital literacy are technical, cognitive, and socio-emotional literacy (e.g. Ng, 2006). The technical measurement is concerned with the skills required to effectively use IT. The cognitive assessment focuses on the ability to rigorously search, evaluate, and synthesize virtual information while also being aware of any moral, ethical, or legal issues. The socio-emotional dimension is concerned with the abilities required to socialize appropriately on the internet.

Students today are at convenience with digital technology and understand how to obtain, produce, and begin sharing digital content (e.g. Ting, 2015). To use right technology, one must be able to locate, manage, investigate and merge digital information. Despite the fact that many students today are assumed to be technologically savvy, many of them struggle to do so effectively. They determined that students needed to learn information management skills like planning, tracking, and controlling, as well as critical thinking skills. The presumption that digital literacy entails beyond just knowing how and where to find information on the web, but also able to comprehend and gathering information from a variety of print or digital source materials (e.g. Gilster, 1997). Understanding how to use technology is only one aspect of digital literacy. An individual's awareness, mindset, and potential to use digital tools and facilities appropriately to identify, access, manage, combine, review, analyze, and summarize digital resources, build new knowledge, create media expressions, and communicate with others in the context of specific life situations; and reflect on this process (e.g. Martin, 2006).

Methods

This observe is an experimental examine with a pre-test and post-test model with a control organization in which the impact of the information and communication technology (ICT) learning version on the extent of virtual literacy of college students majoring in training outside of college. The populace on this observe covered all college students majoring in out-of-school training at the Universitas Negeri Padang and the use of random cluster sampling 83 college students have been selected and located into experimental companies and a manage organization.

Results

The development of data and verbal exchange era-based totally mastering is an effort to expand coaching and gaining knowledge of strategies by utilising digital technology. The kind of digital technologies used by students in getting to know can have the ability to broaden their expertise. This gaining knowledge of version prioritizes the potential and independence of college students within the learning system by using utilising information and communication technology, consequently the lecturer simplest needs to provide an explanation for a touch about the cloth. consequently, when the usage of virtual technology inside the mastering process, students can access knowledge and might argue that the understanding they get is to complement gaining knowledge of and expand information of the issue rely being studied. teachers are not the supply and issuer of all expertise, digital era will put pressure on teachers' efforts to govern the manner students study.

The digital technology is used to access virtual classrooms, create assignments, create digital content, search for information on the internet, access social media, build communication, and collaborate in the learning process. Digital technology has been put to good use by students intentionally to support learning and provide increased knowledge. This study shows that the technology used by students is laptops and smartphones, this is because these media are more affordable and accessible to many students. student-oriented learning activities



Chart 1. ICT-based learning to improve digital literacy

Digital communication and collaboration of students are used to build communication with colleagues, friends across majors, experts/experts and to add insight into the deepening of material through the use of online contacts or social media. According to digital technology has developed into the main channel for communication and interpersonal interaction to maintain relationships and exchange emotional and material support (e.g. Raine & Wellman, 2012). This form of digital communication in learning offers new challenges that are more communicative and active involvement of students in learning so that it has an impact on the awareness and behavior of students themselves. Interactive digital communication using social media in this learning greatly changes interpersonal communication and opens a wider space for knowledge construction. This digital technology is often used to communicate via text messages and social media and use photography and video to produce content to represent themselves and build their own identity and create visibility within their environment.

This change is able to develop various ways for students to engage in networking by collaborating with other academics, non-academics, and various social networks today to be able to contribute to scientific communication. The available social media greatly enhances students' communica-

tiveness for scientific progress and different knowledge and different interests. Continuous exchange of information will build positive individual perceptions of social behavior by sharing knowledge and sharing information with others. This positive norm will guide students to return or provide benefits in the communication to anyone in the learning community. Studies show that behavior focuses on how reciprocal or shared norms are involved in conducting online social interactions. During student learning varies in digital experiences, how to benefit from access on the internet in terms of gaining knowledge as well as communication and interpersonal support of students. Basically digital communication can provide a means to maintain interpersonal relationships and regulate student-led learning. The knowledge obtained is used by students so that the active learning process is able to support the growth of personal knowledge so that it changes students' practices and perspectives (e.g. Bondi, 2017).

Before testing the hypothesis about the effectiveness of information and communication technology-based learning, testing requirements analysis consists of testing the normality of the data and testing the homogeneity of the data. For testing the normality of the data used the Kolmogorov-Smirnov test and testing for homogeneity used the Levene test.

Table 1. Data Normality Test with Kolmogorov-Smirnov

Tests of Normality						
Class	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Post-test Control class	.157	28	.076	.899	28	.011
Post-test Experimental class	.121	28	.200*	.961	28	.374
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

According to Table 1, the calculated probability value of D in the control class pre-test is 0.133 with a probability of 0.200; the calculated probability value of D in the post-test control class is 0.157 with a probability of 0.076; the calculated probability value of D in the experimental class pre-test is 0.153 with a probability of 0.091; and the calculated probability value of D in the post-test experimental class is 0.121 with a probability of 0.200. Because the value in the entire class is greater than = 0.05, the data used can be said to be normally distributed.

Table 2. Testing the homogeneity of the data with Levene's test

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Student Digital Literacy	Based on Mean	.084	3	108	.969
	Based on Median	.113	3	108	.952
	Based on Median and with adjusted df	.113	3	103.392	.952
	Based on trimmed mean	.110	3	108	.954

Table 2 shows that the sig value of 0.969 means that the sig value > 0.05, it can be said that the data used in this study is homogeneous.

After all of the data has been determined to be normal and homogeneous, hypothesis testing is performed. The hypothesis was tested to see if students' digital literacy skills in the experimental

class were higher than students' critical thinking skills in the control class. The results of a comparison of the level of digital literacy ability after treatment in the control and experimental groups are presented in table 3 below.

Table 3. Comparative testing of students' digital literacy levels after treatment in the control class and experimental class

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Posttest Control and Posttest Experimental class	-24.214	14.708	2.780	-29.917	18.511	-8.712	27	.000

Based on the data in table 3, that also shows that the significance value (2-tailed) is $0.000 < 0.05$, it can be defined that there is a significant difference between both the post-test reference of educators in the controlled group and the experimental class after treatment. This demonstrates that the discrepancy between the control and experimental groups has a significant effect. As a consequence, students in the experimental class who were taught using a communication and information technology-based curriculum had higher levels of digital literacy than students in the controlled group who were taught using traditional methods.

Discussion

Indeed, information and communication technology-based learning allows students to gain knowledge and skills for using digital technology to expand their opportunities for independent learning, communication, collaboration, and knowledge creation. Lecturers are no longer the sole source of all knowledge; digital technology will put a strain on lecturers' efforts to control how students learn. Educators assert that they are not the only source of learning in learning activities, but that students obtain information from various media and learning resources on the internet to locate learning materials (e.g. Rusman, 2012). A student can immediately access and receive feedback on the knowledge they are interested in or require. Teaching with films and videos, teaching with programs, teaching machines, rooting modules, and teaching with computer assistance can all benefit from information and communication technology (e.g. Darmawan, 2015). Extending the practice of lecturers and students to use information and communication technology for learning changes the practice of engagement and a more positive attitude of students to learn in situations where technology has the ability to change social relations in the classroom between students, between lecturers and students, and between students and professional experts in various and challenging ways.

An increasing number of social networks and other web offerings can be used for flexible and informal getting to know and offer access to professional specialists and friends. as a consequence, college students can customise their private learning surroundings consistent with their hobbies, gaining knowledge of patterns and aims. This is each an opportunity and a challenge for individual learning. This mastering is based on humanistic principle that is oriented towards private self-improvement. This getting to know pays greater attention to college students' feelings with a pur-

pose to broaden and build harmonious and efficient relationships with their surroundings and make students in my opinion able to process information successfully and effectively (e.g. Darmawan & Dinn, 2018). In this situation, the educator acts as a motivator, not preserving again the sensitivity of college students to their feelings and feelings. consequently, universities have the electricity to develop a personal gaining knowledge of surroundings and need to take benefit of the space for a extra open studying process. the usage of the internet has emerge as the usual, universities turns into extra informed, greater interactive, and greater assured within the use of numerous sorts of hardware and software to inspire and task students (e.g Li, 2012).

Conclusions

The development of information and communication technology-based learning models to improve students' digital literacy skills consists of three stages, namely input, learning process, and output. The input pays attention to the urgency of digital literacy in out-of-school education majors, the available facilities and infrastructure, and the initial abilities of students and lecturers regarding digital literacy which then includes the use of information and communication technology as well as the integration of digital literacy capabilities using the ability to use digital media, digital information, digital communication and collaboration, and digital innovation. The implementation stage of learning into three activities, namely orientation, core, and culmination. In the last stage, evaluating learning and evaluating the level of digital literacy skills of students by giving a post-test to measure the digital literacy of students.

The effectiveness of developing a curriculum model based on information and communication technology was carried out in both the control class and the experimental class. Based on the posttest results of the digital literacy ability level in the two classes, there were significant differences in students' digital literacy abilities in the experimental class before and before treatment as well as in the experimental class and class after treatment.

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