Promoting ICT Utilization in the Teaching-Learning Process in Mathematics 10

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Abstract: ICT utilization offers meaningful and productive learning experiences. The purpose of this study is to identify the significant relationship between the teacher's level of competence in demonstrating ICT skills in the teaching-learning process and student's level of performance in Mathematics 10 competencies. Likewise, it will identify the best practices of the utilization of ICT in terms of usefulness and learner's classroom involvement. Finally, to craft learning resources that can significantly raise students' achievement and learning experience that is effective to invoke interaction among students. In this study, the researcher used the descriptive survey research design. The researchers' survey questionnaires were administered to the teachers of the schools in Mandaue City division. The gathered data and corresponding analyses and interpretations, showed that ICT integration is not new to teachers, and they had the basic skills to do it in the classroom thus boasts the positive result of student's achievement. There was a significant relationship between the teacher's level of competence in demonstrating the skills in utilizing ICT in the teaching-learning process and the student's performance in Math 10 competencies. Finally, the best practice the teachers have been doing in their day-to-day teaching-learning encounters in terms of usefulness is the teacher's routine of acquiring learning resources from the internet. In terms of students' engagement, teachers' utilization of ICT increases the student's confidence to participate actively in class. Thus, it is recommended that more awareness of ICT must be spread among the department to help them understand the power and importance of ICT-enabled education and its scope. The provision of localized training to the teachers to learn and unlearn some aspects of ICT utilization and magnify the best practices worth emulating among teachers is highly recommended.

Keywords: Administration and Supervision, ICT Utilization, Student's Performance, Design, Mandaue City, Cebu..

INTRODUCTION

The research aims to investigate the integration of information and communication technology (ICT) in the teaching-learning process and its impact on education. Education is considered a fundamental element of society, shaping and guiding human civilizations towards a better future. Through education, values such as morality, ethics, and responsibility are instilled in individuals. In recent decades, there have been significant advancements in the field of education, leading to the transformation of traditional teaching methods.

The introduction emphasizes that an effective educational system requires the adoption of appropriate technologies. Prior to the development of ICT, education relied on a combination of traditional and computer-enabled approaches. However, these methods were limited to the classroom setting, hindering the extension of instruction beyond its confines.

Technology has revolutionized various aspects of modern life, including education. The integration of technology has altered the way people think, work, and live. Today, ICT is pervasive, with computers, TVs, and smartphones being common tools used by individuals. This interconnectedness has become a shared aspiration, shaping lifestyles and influencing how people interact, gather information, communicate, and consume.

ICT plays a crucial role in modernizing teaching methods and providing cutting-edge educational resources. It increases student engagement, fosters concurrent technology skill development, and enhances critical thinking and learning techniques across academic disciplines. By incorporating ICT into the teaching-learning process, students acquire 21st-century skills, improve their ICT competence, and become digitally literate. Educators prioritize ICT integration to support students' overall development and prepare them for a technology-driven society.

The use of ICT in education refers to a technologically based teaching and learning process closely tied to the use of educational aids in schools. Since students are accustomed to technology, a technology-based learning environment facilitates better learning outcomes. ICT enhances pedagogical elements in various subject areas, such as mathematics, science, languages, and the arts. It serves as a tool that assists both teachers and students, complementing effective instruction and learning. ICT integration allows for learning to occur regardless of physical distances and beyond the traditional classroom setting.

The proficiency and willingness of teachers to utilize ICT play a crucial role in its successful integration in education. Teachers need to be confident in their ICT skills and have a clear understanding of its educational purpose to effectively incorporate it into their teaching techniques.

The research intends to assess teachers' competence in utilizing ICT in the teaching-learning process and identify best practices in terms of usefulness and learner involvement. By understanding these aspects, the study aims to contribute to the enhancement of education through the effective integration of ICT.

Research Questions:

1. Is there a significant relationship between the teacher's level of competence in demonstrating skills in utilizing ICT in the teaching-learning process and the students' performance in the aforementioned competencies?

2. What are the best practices in the utilization of ICT in teaching the competencies in Mathematics in terms of usefulness of ICT and learner's classroom involvement?

3. Based on the findings, how can ICT-based learning resources for Mathematics 10 be crafted?

Theoretical Background:

The research is grounded in the recognition that traditional teaching and learning methods are no longer suitable for today's learners, who are highly engaged with technology. Technology-enabled learning (TEL) has become crucial in modern education systems. The study draws on the Diffusion of Innovation Theory by Rogers (1962) and John Dewey's Social Learning Theory (1938) to provide a theoretical foundation.

The Diffusion of Innovation Theory, developed by Rogers, explains how new ideas and innovations spread through society over time. It begins with the dissemination of knowledge, followed by users' confirmation of their acceptance and integration of the technology. This theory has been successfully applied in various fields, including communication, to understand how and why new concepts are adopted.

John Dewey's Social Learning Theory supports this research by emphasizing the role of education and social change in creating a better world. Dewey believed that education should focus on social and moral growth, and he advocated for progressive education that incorporates socially engaging learning activities. He viewed schools as social institutions and considered education as a process of living rather than mere preparation for the future.

In today's digital world, where technology dominates students' lives, it is essential for educators to leverage technology to enhance student engagement and foster lifelong learning. Teachers should utilize familiar technologies like cell phones, instant messaging, and wikis to deliver information and academic content effectively. Dewey's social learning theory can be applied in classrooms by using technology that aligns with students' social needs.

To keep up with the digital environment, teachers must integrate ICT into their regular lessons. The Department of Education has issued guidelines and orders, such as DO 26, s. 2009, and DO 78, s.2010, emphasizing the importance of ICT governance and the DepEd Computerization Program. These initiatives aim to equip schools with the necessary technologies, integrate ICT into teaching and learning, and improve ICT literacy among students, teachers, and school administrators.

The DepEd Computerization Program has successfully installed computer labs in public secondary schools, with the goal of providing computer lab packages, e-classrooms, and laptops to enhance ICT integration in the school system. These initiatives aim to bridge the gap in computer resources and increase ICT literacy in public schools.

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Overall, this research acknowledges the need for TEL and ICT integration in education, building on theoretical foundations and government initiatives to promote effective teaching and learning in a technology-driven era.

Methodology

This part contains the research which includes the method used, the flow of the study, research locale, research respondents, research instruments, data gathering procedures, statistical treatment of data, scoring procedures, and definition of terms.

Design

In this study, the descriptive survey research design was used . The researchers' survey questionnaires were administered to the teachers of the schools in Mandaue City division, specifically in Maguikay High School, Tabok National High School and Tingub National High School. Data was analyzed and was interpreted based on the effect of promoting ICT utilization in the teaching-learning among the learners.

Environment

This study was conducted in three (3) public high schools in the West 1 District, Division of Mandaue City. Maguikay High School. Maguikay High School can be found in Mandaue City, Cebu, Philippines' Maguikay. Traditionally, the name evolved from maghikay, Fortuna writes. It implies "to prepare or cook something". The people of Maguikay have long been recognized as skilled cooks, and among their specialties include foods like bud-bud, bibingka, puto, tagaktak, pinyato, masaral (or majareal in older times), and others for which Mandaue is famous. These delicious treats are still made by Maguikay's elders today. Maguikay High School is composed of eight hundred eighty-five (885) students – 779 students from junior high school and 106 students from senior high school, 30 teachers and 1 school head.

Tabok National High School. Tabok National High School is located in Tabok, Mandaue City, Cebu, Philippines. In the old days when there were no bridges, the people of this place had to cross the river on foot; it was, and still is, located at the northern bank of Butuanon River. The act of crossing was "tabok" in Cebuano (a synonym is "labang"). Thus, the place became Tabok (whether one was at either side of the river).

Tabok Mandaue City has a student population of one thousand one hundred three (1003) from Grade 7 to Grade 10, with thirty (30) competent and committed teachers, including four (4) Master Teacher 1, twenty (20) Teacher III, and six (6) Teacher I. Although teaching forces are categorized according to the plantilla position they hold in the actual setting, they are treated as co-equals and collaborate in order to advance and achieve the DEPED goals.

Tingub National High School. Tingub National High School is 1.8 kilometers and six minutes away from Tabok National High School. Additionally, it is a part of the West I District of the Mandaue City Division. It is located in B. Suico, which is within Mandaue City in Cebu Province in the Philippines. The old timers of Tingub swear that the Spaniards named places after what they found there, be it a tree, a flower, a bird, or a thing that was in abundance. For Tingub, it was because of the water that accumulated (tingub) in a small creek (or sapa-sapa in Cebuano) in the

area. The Spaniards were said to have discovered that the waters from Canduman, Tabok, and Pagsabungan flowed and gathering at the sapa-sapa of Tingub.

According to another source, the name came about during the Second World War when people ran and hid in the mountains away from the invading Japanese. Tingub was the ideal hiding place because of the presence of a small creek and the thick stands of bamboo. Sufficient numbers of people could hide there ("Matingub" pag tago ang mga tawo).

The HDP places this evacuation of people from other places to this old sitio of Canduman earlier, to the Philippine Revolution of 1898. Fear of the Spaniards brought them there, and because of the concentrated crowding, the place was called "Tingub". Tingub National High School is composed of 31 teachers and 819 students.

Table 1
Distribution of Respondents

Schools	TEACHERS		LEARNERS	
	Frequency	%	Frequency	%
Maguikay High School	10	33.33	30	33.33
Tabok National High School	10	33.33	30	33.33
Tingub National High School	10	33.33	30	33.33
Total	**30**	**100**	**90**	**100**

students from the three identified schools. The teachers and students answered the questionnaires administered to them. Table 1 presented the summary of the distribution of respondents in this study.

Instrument

The questionnaires used in this study were made up of four (4) parts. The first part of the questionnaire contained the demographic information of the teachers. The second part surveyed the availability of ICT resources in school. The third part was adapted from the journal of Oguguo, B. C. E.(2020) Assessment of ICT Skills Relevant for Effective Learning. It was modified and considered suitable for this study. This is a 26-item test following a 4-point Likert Scale: 4 for Strongly Agree, 3 for Agree, 2 for Disagree, and 1 for Strongly Disagree. The fourth part was adapted from Fraillon, J (2019), IEA International Computer and Information Literacy Study 2018 Assessment Framework. This tool enables the researchers to identify the best practices of the utilization of ICT in terms of its usefulness and learner's classroom involvement.

To find the student's performance in the identified Mathematics 10 competencies, the researchers collected the students' performance level of their summative test.

Data Gathering Procedures

1. Research Preparation. The researchers secured a permit to conduct the study from the Schools' Division Superintendent of Mandaue City.

2. Research Instrument Administration. The researchers asked permission from the principals of the participating schools and from the teachers to conduct the data gathering. Data was gathered, presented, analyzed, and then interpreted.
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Statistical Treatment

All the data collected from the respondents were gathered together and was analyzed using the following statistical treatments:

1. Simple Percentage. This statistical treatment was utilized to get the profile or other relevant information of the respondents, such as age, gender, civil status, highest educational attainment, number of years in service, and the number of ICT-related training, seminars, and workshops attended and the availability of ICT resources of the school.

2. Weighted Mean. This statistical treatment measured the teacher's level of competence in demonstrating the skills in utilizing ICT in the teaching-learning process utilization in terms of learning and involvement.

3. Mean. This statistical treatment gauged the student's performance of the identified Mathematics 10 competencies.

3. Spearman's Rank Correlation Coefficient. This statistical treatment determined the strength of a link between two sets of data specifically between the teacher's level of competence in demonstrating the skills in utilizing ICT in the teaching-learning process and the student's performance in the identified competencies.

Scoring Procedures

The participants were required to use a Likert scale to determine the teacher's level of competence in demonstrating the skills in utilizing ICT in the teaching-learning process. Each item was rated on a 4-point Likert scale. The following are the scoring procedures:

A. Teacher's Level of Competence in Demonstrating the Skills in Utilizing ICT

Weight	Range	Response Category	Verbal Description
4	3.26 -4.00	Strongly Agree	The skill is manifested very well all the time.
3	2.51 – 3.25	Agree	The skill was manifested very well and frequently
2	1.76 – 2.50	Disagree	The skill was manifested irregularly
1	1.00 -1.75	Strongly Disagree	The skill was not manifested.

B. Best Practices in the Utilization of ICT

Weight	Range	Response Category	Verbal Description
4	3.26 -4.00	Always	The routine was practiced very well all the time.

3	2.51 – 3.25	Sometimes	The routine was practiced very well and frequently
2	1.76 – 2.50	Seldom	The routine was practiced irregularly
1	1.00 -1.75	Never	The routine was not practiced.

Results and Discussion:

Significant Relationship between the Teacher's Level of Competence in Demonstrating the Skills in Utilizing ICT in the Teaching-Learning Process and the Student's Performance in the Identified Math 10 Competencies

To maximize student learning, teachers must demonstrate proficiency in the use of ICT throughout the teaching-learning process. ICT promotes the use of innovative educational materials and the renewal of learning techniques, fostering more active student cooperation and the concurrent acquisition of technological expertise. Table 1 illustrates the correlation between the teacher's level of ability in displaying ICT teaching-learning skills and the student's performance in the recognized Math 10 competencies.

Table 2

Relationship Between the Teacher's Level of Competence in Demonstrating the ICT Skills in the Teaching-Learning Process and the Student's Performance in the Identified Math 10 Competencies

	Computed r-value	Critical p-value	Decision on Ho	Interpretation
Teacher's level of competence and student's performance	-0.08	0.39	Reject Ho	Significant

@0.05 level of significance

The testing of the relationship between the teacher's level of competence in demonstrating the skills in utilizing ICT in the teaching-learning process and the student's performance in the identified Math 10 competencies resulted in a correlation given the computed p-value of 0.39 tested at a 0.05 level of significance. It means that a teacher's level of competence in ICT utilization creates an impact on the students' performance in Math. Learners learn at their best when it was aided with ICT. Utilizing ICT helped a lot in teaching and learning and made the lessons understandable for all learners.

BEST PRACTICES OF THE UTILIZATION OF ICT IN TEACHING THE COMPETENCIES IN MATHEMATICS

The ability of teachers to design learning in creative ways, integrate technology appropriately, create socially engaged classrooms, and promote cooperative interaction, collaborative learning, and group work are crucial to the success of ICT integration into the learning environment. It also

encourages participation and attention from students without wasting time or effort, teachers assist education to ensure that learning objectives are met. Table 18 shows the teacher's best practices in utilizing ICT.

Usefulness

ICT enables the use of new educational materials and learning methods, allowing students to collaborate more actively and simultaneously to acquire technological expertise. Table 18 shows the usefulness of utilizing ICT.

Table 3
Best Practices of the Utilization of ICT in terms of Usefulness

Practices in utilizing ICT in terms of Usefulness	RANK
I find useful teaching resources on the Internet.	1
I produce presentations (e.g., Microsoft PowerPoint or a similar program) with simple animation functions.	2
I use a spreadsheet program (e.g., Microsoft Excel) for keeping records or analyzing data	3
I use shared resources (e.g., Google Docs, OneNote, Padlet) to collaborate with the students.	4
I use cloud storage (Google Drive, One Drive, etc) in storing my documents and learning resources.	5
I allow students to use Microsoft office (MS Word, MS Excel, MS PowerPoint) in making their outputs.	6
I allow my students to utilize the learning resources available in our school (computer laboratory, e-classroom, etc.)	7
I use a learning management system like google classroom, Microsoft Teams, Moodle, etc.	8
I use shared resources (e.g., Google Docs, OneNote, Padlet) to collaborate with the students.	9
I made video lessons for my students.	10

Table 3 shows that items 1 through 5 are in the top five. This means that the internet is useful in the teaching-learning process. The data showed that teachers can make presentations; can use spreadsheets; know how to share resources with students; and know how to use cloud storage. As a result of this, the implementation of information and communication technology (ICT) is generally recognized as being beneficial.

The result implies that teachers need to have extensive pedagogical knowledge so they can accommodate and integrate ICT effectively in their teaching. In short, education today needs teachers to develop and design their instructional planning involving 3 major areas; technology, pedagogy and content knowledge (TPACK) (Mishra & Koehler, 2006). Teachers have used media extensively in the classroom throughout history. The term "audio visual aids" refers to a variety of modern electronic media, including television video cassettes and audio equipment, as well as projected and non-projected materials (AVA).

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Classroom Involvement

ICT enables the use of new educational materials and learning methods, allowing students to collaborate more actively and simultaneously to acquire technological expertise. Table 3 shows the best practices of the utilization of ICT in terms of classroom involvement.

Table 4
Best Practices of the Utilization of ICT in terms of Classroom Involvement

Practices in utilizing ICT in terms of Classroom Involvement	RANK
The use of ICT increases the students' confidence to participate actively in the class.	1
The use of ICT promotes active and engaging lesson for students' best learning experience.	2
The use of ICT encourages students to communicate more with their classmates.	3
Students are more behaved and under control with the use of ICT.	4
The use of ICT enables the students to express their ideas and thoughts better.	5

The best practices in the students' classroom involvement, numbers 1 to 3 rank in the top 3, which leads to the conclusion that ICT helps increase students' confidence in participating in a class, promotes active and engaging lessons and encourages students to communicate more with their classmates. Consequently, it is generally accepted that the use of ICT in the classroom can be advantageous to the students and can increase their engagement.

Conclusion:

Based on the findings of this study, it can be concluded that the teacher's level of competence in demonstrating skills in utilizing ICT in the teaching-learning process has a significant impact on students' performance in the identified Math 10 competencies. The study revealed that the majority of the teachers in the sample had a high level of competence in basic ICT skills and were consistently utilizing ICT in the classroom. The students' level of performance in the identified competencies was found to be at a mastery level, indicating that the use of ICT in teaching had a positive effect on student achievement.

Furthermore, the study found a significant relationship between the teacher's level of ICT competence and student performance. This highlights the importance of teachers' proficiency in utilizing ICT tools and resources to enhance the teaching-learning process and improve student outcomes.

In terms of best practices, the teachers' routine of acquiring learning resources from the internet was identified as a useful strategy. This practice enabled teachers to access a wide range of relevant materials and incorporate them into their lessons effectively. Additionally, the utilization of ICT increased student engagement and confidence, leading to active participation in the classroom.

Recommendations

Based on the findings, several recommendations can be made to further enhance the integration of ICT in teaching Math 10 competencies:
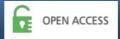
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1. Professional Development: Schools should provide well-structured learning support, such as workshops or training courses, to improve teachers' ICT skills and prepare them to overcome challenges associated with integrating technology. Continuous professional development programs can help teachers stay updated with the latest ICT tools and strategies.

2. Awareness and Advocacy: There is a need to spread more awareness of the power and importance of ICT-enabled education among the education department. Efforts should be made to communicate the potential benefits of ICT integration and its scope in enhancing teaching and learning outcomes.

3. Localized Training: Localized training programs should be implemented to address specific ICT utilization needs and challenges within the context of the schools. These programs can help teachers learn and unlearn certain aspects of ICT utilization and promote the adoption of best practices that have proven successful among their peers.

References:

1. Bosch, C., Laubscher, D. J., & Kyei-Blankson, L. (2021). *Re-Envisioning and Restructuring Blended Learning for Underprivileged Communities*. IGI Global.

2. De Byl, P.; Hooper, J. Key attributes of engagement in a gamified learning environment. In Proceedings of the ASCILITE Australian Society for Computers in Learning in Tertiary Education Annual Conference Australasian Society for Computers in Learning in Tertiary Education, Sydney, Australia, 1–4 December 2013; pp. 221–230. [Google Scholar]

3. *Diffusion of Innovation Theory*. (n.d.). https://sphweb.bumc.bu.edu/otlt/mph-modules/sb/behavioralchangetheories/behavioralchangetheories4.html#:~:text=Diffusion%20of%20Innovation%20(DOI)%20Theory,specific%20population%20or%20social%20system.

4. Durnali, M. (2019). *Utilizing Technology, Knowledge, and Smart Systems in Educational Administration and Leadership*. IGI Global.

5. *e-Classroom - The Future of Education*. (2016, March 31). Ed Tech. https://edtechnyc.org/e-classroom-the-future-of-education/

6. Flinders, D., & Thornton, S. (2013). *The curriculum studies reader*. (4th Ed.). New

7. York:Routledge.

8. Fort, A. (2021, May 12). *8 Computer Skills For Every Teacher To Master*. eLearning Industry. https://elearningindustry.com/8-computer-skills-every-teacher-to-master

9. Fraillon, J., Ainley, J., Schulz, W., Duckworth, D., & Friedman, T. (2019). IEA International Computer and Information Literacy Study 2018 Assessment Framework. *Springer International Publishing EBooks*. https://doi.org/10.1007/978-3-030-19389-8

10. Ghavifekr, S., Razak, A. Z. A., Ghani, M. F. A., N, R., Meixi, Y., & Tengyue, Z. (2014). ICT Integration In Education: Incorporation for Teaching & Learning Improvement. *Malaysian Online Journal of Educational Technology*, *2*(2), 24–45. http://files.eric.ed.gov/fulltext/EJ1086419.pdf

11. Ghavifekr, S., Kunjappan, T., Ramasamy, L., & Anthony, A. (2016). Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions. *Malaysian Online Journal of Educational Technology*, *4*(2), 38–57. http://files.eric.ed.gov/fulltext/EJ1096028.pdf

12. *ICT Integration In Education: Incorporation for Teaching & Learning Improvement*. (n.d.). https://files.eric.ed.gov/fulltext/EJ1086419.pdf

13. *International Journal of Educational Management and Development Studies*. (2021). Institute of Industry and Academic Research Incorporated.

International Journal of Business Diplomacy and Economy
For more information contact: mailto:editor@inter-publishing.com

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14. Iiyoshi, T., & Kumar, V. (2010). *Opening Up Education: The Collective Advancement of Education through Open Technology, Open Content, and Open Knowledge*. MIT Press.

15. Iskander, M. (2007). *Innovations in E-learning, Instruction Technology, Assessment and Engineering Education*. Springer Science & Business Media.

16. Jamieson-Proctor, R., Albion, P., Finger, G., Cavanagh, R., Fitzgerald, R., Bond, T.,

17. & Grimbeek, *P. (2013). Development of the TTF TPACK Survey Instrument*. Australian Educational Computing, 27(3),26-35.

18. *John Dewey in the 21st Century*. (n.d.). Retrieved February 16, 2023, from https://files.eric.ed.gov/fulltext/EJ1158258.pdf

19. *June 10, 2010 DO 78, s. 2010 – Guidelines on the Implementation of the DepEd Computerization Program (DCP) | Department of Education*. (2010, June 10). https://www.deped.gov.ph/2010/06/10/do-78-s-2010-guidelines-on-the-implementation-of-the-deped-computerization-program-dcp/

20. *Mandaue City Web Portal - Maguikay*. (n.d.). https://www.mandauecity.gov.ph/about/barangays/maguikay

21. *Mandaue City Web Portal - Tabok*. (n.d.). https://www.mandauecity.gov.ph/about/barangays/tabok

22. *Mandaue City Web Portal - Tingub*. (n.d.). https://www.mandauecity.gov.ph/about/barangays/tingub

23. *March 26, 2009 DO 26, s. 2009 – Amending DepEd Order No. 1, s. 2007 (Strengthening the Information Communication Technology (ICT) Governance of the Department of Education) | Department of Education*. (2009, March 26). https://www.deped.gov.ph/2009/03/26/do-26-s-2009-amending-deped-order-no-1-s-2007-strengthening-the-information-communication-technology-ict-governance-of-the-department-of-education/#:~:text=Sets%20standards%20in%20the%20development,DepED%20offices%20in%20all%20levels

24. Oguguo, B. C. E., Okeke, A. O., Dave-Ugwu, P. O., Ocheni, C. A., Ugorji, C. O., Nwoji, I. H. N., & Ike, I. C. (2020). Assessment of ICT Skills Relevant for Effective Learning Possessed by Undergraduate Students at University of Nigeria. *International Journal of Higher Education*. https://doi.org/10.5430/ijhe.v9n4p206

25. Saif, S. M., Ansarullah, S. I., Othman, M., Alshmrany, S., Shafiq, M., & Hamam, H. (2022). Impact of ICT in Modernizing the Global Education Industry to Yield Better Academic Outreach. *Sustainability*, *14*(11), 6884. https://doi.org/10.3390/su14116884

26. Park, S., & Schied, F. M. (2007). The Limits of Dewey's Philosophy:Cultural Historical Activity Theory and Experience. *Journal of Inquiry & Action in Education, 9(1), 2017*.

27. *PressReader.com - Digital Newspaper & Magazine Subscriptions*. (n.d.). PressReader. https://www.pressreader.com/

28. *The effect of using word processor in teaching writing skill among secondary students in schools in Jordan*. (2021). http://www.academicjournals.org/ERR. Retrieved March 16, 2022, from https://academicjournals.org/journal/ERR/article-full-text-pdf/133D87167235

29. Unhelkar, B. (2016). *Green IT Strategies and Applications: Using Environmental Intelligence*. CRC Press.

30. Unhelkar, B. (2010). *Handbook of Research on Green ICT: Technology, Business and Social Perspectives: Technology, Business and Social Perspectives*. IGI Global.

31. *What is Learning resources materials | IGI Global*. (n.d.). https://www.igi-global.com/dictionary/learning-resources-materials/101399

32. Wikipedia contributors. (2023, February 13). *Learning*. Wikipedia. https://en.wikipedia.org/wiki/Learning