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Impact of Digital Study Material on Student Learning

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Abstract **-** Traditional education is concentrated on schools, teachers, and print media, where most people do not have access to knowledge, and even those who have could not receive current information relevant to today's context. However, contemporary society demands real-time information; thus modern education landscape has been seen as an ever-increasing concoction of technology in classrooms. This in-depth investigation aims to comprehend digital study materials' effects on learners whose instructors employ various technological tools. Students at (Krupanidhi Degree College) were asked to fill out a questionnaire that covered various topics related to digital study resources to understand their thoughts. According to the survey's findings, out of 108 respondents, the majority (96.2%) agreed that the rise of digital content had influenced their reading interests and habits, while (4.8%) disagreed or expressed no opinion. Analysis of participants' responses suggests that technology tools are more suitable for the younger generation and students are more motivated.

Keywords: *Study material, Digital learning, Modern education, Traditional education*

Introduction

Mobile learning, instant messaging, and mobile voice are just a few interactive multimedia networks that have emerged recently due to the rapid development of Internet and wireless communication technologies. Reading is viewed as a process, a way of thinking, a type of real-life experience, and incorporates numerous sophisticated abilities (Ogunbodede & Sawyerr-George, 2023; Shariza & Amelia, 2006). Reading is the consequence of the interaction between the reader's language abilities and general knowledge of the world and how graphic symbols that convey knowledge are perceived. It is the meaningful interpretation of spoken signals seen in writing or print. It's believed that reading promotes a person's health and personal growth. Conventional teaching would be replaced by using the Internet's suitability and popularity for using digital learning materials and accomplishing the goal of national and international competitiveness. Therefore, it makes sense that the educational system will emulate society and integrate technology and digital information into the classroom. By incorporating more multimedia into their teaching strategies, teachers are achieving this. This research work is founded on the idea that students will become more interested in class if various learning resources are introduced during the academic semester. The student's sense of ownership over their education will increase, and their perception of themselves will improve. When examining their various features, there is a vast range of available e-textbooks. E-textbooks combine well-known aspects of textbooks into a digital version that can be accessed through the Internet or an app (Dobler, 2015).

Every industry, including entertainment, business, housing, economics, advertising, and healthcare, to name a few, has been completely taken over by digital technology. Digital technologies are not only an integral part of our lives but are also becoming understated. Examining viewpoints from students, teachers, and district officials in the literature will clarify this developing subject. Lee et al. (2013) said, "Digital study materials will potentially replace existing paper-based/ printed textbooks in the educational curriculum." Current students are mainly the ones who are most likely to use electronic textbooks. Karim and Hassan (2007), the desire to read, and the increased availability of books are indicators of global advancement. Understanding how students view printed and digital books from a teacher's standpoint is crucial because teachers are continuously challenged to offer unique, enjoyable, and interactive experiences for a wide range of pupils. Various media can be used to represent

explicit information. The media used to represent them include text, graphics, animation, sound, and video (Grzeschik et al., 2011).

Many students, however, still prefer print versions of study materials over digital ones because they feel that print is more familiar and pleasant to use and can be read without specialized hardware or software. According to numerous researchers, digital study materials have advantages over printed ones. Digital study resources, as compared to traditional schooling, offer more flexibility and accessibility, according to Woody et al. (2010). Technology is now unquestionably a significant component of secondary and post-secondary education nowadays (Facer & Selwyn, 2013). What was once a curiosity is now at the heart of how many districts formulate their policies. Technology integration is increasingly being explored at international conferences where educational institutions and thought leaders exchange philosophy and policy.

Additionally, digital study materials include note-sharing or a discussion forum so students can work together. Doris Holzberger et al. (2013), digital learning refers to delivering digital media (such as text or images) over the Internet. Using wired or wireless networks, Anttila et al. (2012) defined digital learning as a tool for acquiring digital instructional materials for online or offline learning activities (Hockly, 2012; Bujang,et al., 2020).

Literature Review

Doris Holzberger et al. (2013), digital learning is the delivery of learning content and teaching methods using digital media (such as texts, images, or videos) over the Internet to demonstrate the effectiveness of the teaching methods and advance students' knowledge and skills. Block et al. (2013), extrinsic motivation may direct early learning (Chen et al., 2021). Yoon et al. (2012), Jay Cross first suggested the idea of digital learning in 1999. Karim (2012), the fundamental tenet of digital learning is to increase learning outcomes by guiding personal history (Poehner & Wang, 2021). The implications of digital learning on student learning performance and relationships were discussed (Mostafa and Esmaeel, 2012).

The distinctions between traditional learning environments and people and digital learning environments were discussed (Yien et al., 2011; Schöbel et al., 2021). Sun et al. (2012), effective digital learning materials could recognize students' learning and help them see improvement (Raza et al., 2021). Digital learning materials, according to Shin et al. (2011), encourage the use of information technology (IT) (Chung et al., 2018). Sahbaz (2012), students with more significant learning motivation would demonstrate more excellent learning results. Akkan et al. (2012) carried out a case study using qualitative techniques such as questionnaires, interviews, and classroom settings (Tu 2021).

Sahin (2011), there is a direct relationship between the degree of student involvement and the digital learning content (Madhuri and Janvi 2023; Liu et al., 2021). Woody (2010) studied factors affecting a student's preference for digital learning materials. Shariza and Amelia (2006), it is a method, a way of thinking, a type of practical experience, and complicated talents. Pandian claims that only 20% of Malaysians are "reluctant readers" and that 80% read regularly.

Digital learning materials may eventually replace current paper-based textbooks in the school curriculum (Lee et al., 2013). Weisberg (2011) study found that people mostly read digital learning materials on devices with simple reading capabilities (Ross et al., 2017).

Research Methodology

For undergraduate and postgraduate students at Krupanidhi Degree College, a convenient sampling technique was used; a survey was done using a questionnaire that asked them about various topics related to digital study materials to understand their perspectives. Five courses totaling 123 students were chosen as the research subjects. Most respondents (96.2%) of students strongly concur that using digital resources has increased their interest in reading, and (4.8%) of students are at ease with using traditional teaching techniques. The 12-week descriptive-analytical study approach was used, and 3 hours per week of research were put into it (a total of 36 hours). Descriptive statistics, One-way ANOVA, and Cronbach alpha were used to analyze the collected data using IBM SPSS 26.0.

Analysis Method

Descriptive analysis is further used to understand their opinions on reading habits and interactions developed due to digital materials.

Table1: Descriptive statistics of Demographic variables

Variables		Frequency	Percentage	Mean	Std. Deviation
Age (in Year)	18-20	81	64.8	1.39	.581
	21-22	40	32.0		
	23-24	3	2.4		
	25 and above	1	.8		
Gender	Male	56	44.8	1.55	.499
	Female	69	55.2		
Qualification	Under Graduate	101	80.8	1.19	.395
	Post Graduate	24	19.2		
Course	B.Com	77	61.6	1.86	1.358
	BCA	23	18.4		
	M.Com	2	1.6		
	MCA	11	8.8		
	MBA	12	9.6		
Year	1st Year	72	57.6	1.63	.809
	2nd Year	27	21.6		
	3rd Year	26	20.8		

Table 1 shows that the age range from 18-20 has the highest percentage of 64.8, whereas the age of 25 and above has the lowest percentage of 8. The variable gender females have the highest percent of 55.2, whereas the variable gender male has the lowest percent of 44.8. The variable qualification undergraduates have the highest percent of 80.8, whereas the variable qualification postgraduates have the lowest percent of 19.2. The course B.com has the highest percentage of 61.6, whereas the MBA has the lowest of 9.6.

Table 2: Descriptive statistics for questionnaire item variables

Variables	Strongly agree	Agree	Neither agree or Disagree	Disagree	Strongly Disagree	Mean	Std. Deviation
The notes, pdf, the document are largely student-focused with students taking an active role in learning.	25.6	48.0	21.6	2.4	2.4	2.08	.885
The teaching material (ppt slides) provided has helped me to achieve the learning objective.	32.0	55.2	6.4	3.2	3.2	1.90	.893
The learning material used is attractive, interesting and suitable to the level of students.	27.2	55.2	12.8	1.6	3.2	1.98	.871
Sufficient background information is provided.	20.8	55.2	20.0	3.2	.8	2.08	.779
Sufficient detail is given for each phase of the instructional plan to allow every student to duplicate this document.	16.8	51.2	28.0	4.0	.000	2.19	.759
Meaningful context is embedded in learning material to promote conceptual understanding.	24.8	58.4	12.0	4.0	.8	1.98	.777
A concise document overview is provided.	18.4	57.6	19.2	3.2	1.6	2.12	.799
The learning material is cohesive: standards, lessons, and assessments are well aligned.	17.6	64.0	13.6	4.8	.000	2.06	.711
Explore phases of the instructional plan precedes explanations of the content.	14.4	64.8	18.4	2.4	.000	2.09	.648
The document provided explained concepts and gave directions with clarity.	22.4	57.6	16.0	3.2	.8	2.02	.767
Questions and answers are brief and clear.	20.8	58.4	17.6	3.2	0	2.03	.718
Was there any information that you are very unlikely to use upon completion.	12.0	36.0	43.2	8.0	.8	2.50	.839
Was the module interesting.	20.0	59.2	17.6	1.6	1.6	2.06	.765
Images support the e-learning content.	31.2	54.4	9.6	4.0	.8	1.89	.795
Scenarios help illustrate real-world situations.	25.6	52.8	16.0	4.8	.8	2.02	.828
Piece of knowledge was easy to acquire from the material provided.	23.2	54.4	16.8	3.2	2.4	2.07	.863
We can connect it with other learners sharing resources, ideas.	23.2	59.2	13.6	4.0	0	1.98	.729
It's easily shareable and can be accessed anywhere at your convenience.	32.8	56.8	8.8	1.6	.000	1.79	.664
Gamification elements like badges, points in it are useful to the learner.	22.4	55.2	19.2	3.2	.000	2.03	.740
The material can be improved in a much better way to help every student in the future.	25.6	57.6	12.8	3.2	.8	1.96	.766
The material provide made you think differently about a certain topic compared to the printed notes.	24.0	53.6	16.0	4.0	2.4	2.07	.881
The quality of visuals (images, videos) in the document provided is good.	25.6	56.8	14.4	3.2	.000	1.95	.728
Would you like the covered topics to be described as quizzes in terms of question variety.	24.8	52.8	17.6	2.4	2.4	2.05	.860
The material can be accessed by anyone without a lot of rules.	23.2	53.6	16.8	3.2	3.2	2.10	.902
This material allows learners to spend additional time on difficult concepts before moving on or skipping material they already understand.	16.8	64.0	14.4	4.0	.8	2.08	.736
It reduces the variability introduced through multiple sessions in different locations.	17.6	57.6	20.0	3.2	1.6	2.14	.797
Correction and modification of notes/concepts without corrupting files	19.2	51.2	24.8	2.4	2.4	2.18	.853

Table 2:- In Table 2, the following variables are therefore proposed in this study:- Strongly Agreed:- For the questions like "Achieving learning objectives, "32.0% of students, followed by "Students-focused material"25.6%, "Relevant to the students"27.2%, and "E-learning images"32.8% of students have strongly agreed. Agreed: - For the questions like "Cohesive materials"64.0 % of students, followed by "Phases of instructional explanation and plan"64.8%, "Interesting modules"59.2%, and "Connecting it with Erudite"59.2% of students agreed.

Anova

This study shows a strong significant association between one and the other questions and teaching effectiveness in digital learning. The above table reveals remarkable effects of significance (assigned as p-value<0.05) on learning effects. Under the one-way ANOVA test, the following questions: 'Student-focused learning material', followed by 'Achieve learning objective', 'Relevant to the students', 'Unanimous and accessible material', 'Good quality of images and videos' shows Non-significance (NS) (P value>0.05) value with the question 'Information that unlikely used upon The following questions: 'Student- focused learning material', followed by 'Achieve learning objective', 'Relevant to the students', 'Unanimous and accessible material', 'Good quality of images and videos' shows Non-significance (NS) value with the question 'Information that unlikely used upon completion'. The following question: 'Sufficient instructional plan is provided to edit the document', shows Non-significance (NS) value with the question 'E-learning images'. The following questions: 'Student-focused learning material', followed by 'Achieve learning objective', 'Relevant to the students', shows Non-significance (NS) value with the question 'Information that is unlikely used upon completion'.

Table 3. One-way ANOVA for questionnaire items with Demographic variables

ANOVA				
	Age (in Year)	Qualification	Course	Year
	Sig.			
The notes, pdf, the document are largely student-focused with students taking an active role in learning.	NS	S	S	S
The teaching material (ppt slides) provided has helped me to achieve the learning objective.	NS	S	S	S
The learning material used is attractive, interesting and suitable to the level of students.	NS	S	S	NS
Sufficient background information is provided.	NS	NS	NS	NS
Sufficient detail is given for each phase of the instructional plan to allow every student to duplicate this document.	NS	NS	NS	NS
Meaningful context is embedded in learning material to promote conceptual understanding.	NS	S	S	S
A concise document overview is provided.	NS	NS	S	S
The learning material is cohesive: standards, lessons, and assessments are well aligned.	S	NS	NS	NS
Explore phases of the instructional plan precedes explanations of the content.	NS	NS	NS	NS
The document provided explained concepts and gave directions with clarity.	NS	NS	NS	S
Questions and answers are brief and clear.	NS	S	S	NS
Was there any information that you are very unlikely to use upon completion.	NS	NS	NS	NS
Was the module interesting.	NS	S	S	NS
Images support the e-learning content.	NS	S	NS	NS
Scenarios help illustrate real-world situations.	S	NS	NS	NS
Piece of knowledge was easy to acquire from the material provided.	NS	NS	S	S
We can connect it with other learners sharing resources, ideas.	NS	NS	NS	NS
It's easily shareable and can be accessed anywhere at your convenience.	NS	NS	S	NS
Gamification elements like badges, points in it are useful to the learner.	S	NS	S	NS
The material can be improved in a much better way to help every student in the future.	NS	NS	NS	S
The material provide made you think differently about a certain topic compared to the printed notes.	NS	NS	NS	NS
The quality of visuals (images, videos) in the document provided is good.	NS	S	NS	S
Would you like the covered topics to be described as quizzes in terms of question variety.	S	NS	NS	NS
The material can be accessed by anyone without a lot of rules.	NS	NS	NS	S
This material allows learners to spend additional time on difficult concepts before moving on or skipping material they already understand.	NS	NS	NS	NS
It reduces the variability introduced through multiple sessions in different locations.	NS	NS	NS	NS
Correction and modification of notes/concepts without corrupting files	NS	NS	NS	NS

*S= Significance, NS= Non significance

We have taken two values where 'S' is 0.05 Non-significance from the above ANOVA test table the following questions like 'Cohesive learning material', followed by 'Real-world situations', 'Gamification elements' and 'Topics to be as quizzes' supports the Age variable as a significance (S) value. The following questions like 'Student-focused learning material', followed by 'Achieve learning objective', 'Relevant to the students', 'Promote conceptual understanding', 'Questions - answers are brief and clear', 'Interesting module', 'Good quality of images and videos' supports the Qualification variable as a significance (S) value. The following questions like 'Student- focused learning material', followed by 'Achieve learning objective', 'Relevant to the students', 'Promote conceptual understanding', 'Concise document', 'Clear concept', 'Interesting module', 'Easy to acquire knowledge', 'Material can be improved in future', 'Unanimous and accessible material without rules', 'Good quality of images and videos' supports the Year variable as a significance (S) value. The following questions like 'Student-focused learning material', followed by 'Achieve learning objective', 'Relevant to the students', 'Promote conceptual understanding', 'Concise document', 'Clear and brief Question and Answers', 'Interesting module', 'Easy to acquire knowledge', 'Gamification elements', 'Unanimous and accessible material' supports the Course variable as a significance (S) value.

Table 4. Reliability Statistics

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.953	.955	27

The Cronbach alpha test is used to check the reliability of the collected data questionnaire items; the result for the 27 questionnaire items shows 0.953, which is highly significant ($p<0.01$).

Conclusion

The study finds that almost all students use digital learning resources to aid in subject learning. Learning outcomes will be enhanced, particularly by giving students more time to learn while using digital learning resources. Teachers would gain from integrating digital learning into classroom instruction in addition to pupils, along with the professors' enthusiasm for their work. The effect of digital learning resources, tools, and materials on student learning has been the subject of a substantial body of research. And the results are typically favorable. Reading, writing, and speaking skills are all improved by using digital learning materials. Speaking and listening skills are also developed. In conclusion, using digital learning materials benefits schools that provide these courses and the tutors who teach them. Therefore, I suggest that digital learning resources be included in classroom instruction at all schools and that studies be done to determine how to enhance this learning process.

References

[1] Akkan, Y., Cakiroglu, U., & Guven, B. (2012). Analyzing the effect of web-based instruction applications to school culture within technology integration. *Educational Sciences: Theory and Practice*, 12(2), 1043-1048

[2] Anttila, M., Valimaki, M., Hatonen, H., Luukkaala, T., & Kaila M. (2012) Use of web-based patient education sessions on psychiatric wards. *International Journal of Medical Informatics*, 81 (6), 424-433.

[3] Block, L., Jesness, R., & Schools, M. P (2013). One-to-One Learning with iPads Planning & Evaluation of Teacher Professional Development College of Education, Leadership & Counseling. University of ST Thomas Minnesota.

[4] Bujang, S. D. A., Selamat, A., Krejcar, O., Maresova, P., & Nguyen, N. T. (2020, April). Digital learning demand for future education 4.0—Case studies at Malaysia education institutions. In *Informatics* (Vol. 7, No. 2, p. 13). MDPI.

[5] Chen, Y. C., Fan, K. K., & Fang, K. T. (2021). Effect of flipped teaching on cognitive load level with mobile devices: the case of a graphic design course. *Sustainability*, *13*(13), 7092.

[6] Chung, N., Lee, H., Kim, J. Y., & Koo, C. (2018). The role of augmented reality for experience-influenced environments: The case of cultural heritage tourism in Korea. *Journal of Travel Research*, *57*(5), 627-643.

[7] Dobler, E. (2015). E-textbooks. *Journal of Adolescent & Adult Literacy*, 58(6), 482-491. doi:10.1002/jaal.391

[8] Facer, K., & Selwyn, N. (2013). The Politics of Education and Technology: Conflicts, Controversies, and Connections. New York: Palgrave Macmillan.

[9] Grzeschik, K., Kruppa, Y., Marti, D and P. Donner. (2011). Reading in2110 – reading behavior and reading devices: a case study. ElectronicLibrary. [Online]. 29(3). pp. 288-302. Available:http://www.emeraldinsight.com/

[10] Hockly, N. (2012). Substitute or redefine? Modern English Teacher, 21(3), 40-42.

[11] Holzberger, D., Philipp, A., & Kunter, M. (2013). How teachers' self-efficacy is related to instructional quality: A longitudinal analysis. *Journal of Educational Psychology*, 105 (3), 774-786.

[12] Karim, N. S and Hasan, A (2007), Reading habits and attitude in the digital age: Analysis of gender and academic program differences in Malaysia, Electronic Library, vol. 3, pp. 285-298.

[13] Karim, S. (2012) Dynamic assessment of L2 learners' reading comprehension processes. A Vygotskian Perspective *Science Direct*, 321-328.

[14] Lee, H. J., Messom, C., & Yau, K. A. (2013). Can an electronic textbook be part of K-12 education? Challenges, technological solutions and open issues. *Turkish Online Journal of Educational Technology - TOJET*, 12(1), 32-44.

[15] Liu, Y., Bellibaş, M. Ş., & Gümüş, S. (2021). The effect of instructional leadership and distributed leadership on teacher self-efficacy and job satisfaction: Mediating roles of supportive school culture and teacher collaboration. *Educational Management Administration & Leadership*, *49*(3), 430-453.

[16] Madhuri, M., & Janvi, K. (2023). A Study on the New Paradigm Shift to Online Education in Schools During Covid-19: Challenges of Educators. *MIER Journal of Educational Studies Trends and Practices*, 356-378.

[17] Mostafa, P., & Esmaeel, A. (2012). Teacher motivational practice, student motivation, and possible L2 selves: An examination in the Iranian EFL context. Language Learning, 62(2), 571-594.

[18] Ogunbodede, K. F., & Sawyerr-George, O. E. (2023). Digital resources and the reading habits of university students in Nigeria. *International Journal of Professional Development, Learners and Learning*, *5*(1).

[19] Poehner, M. E., & Wang, Z. (2021). Dynamic assessment and second language development. *Language Teaching*, *54*(4), 472-490.

[20] Raza, S. A., Qazi, W., Khan, K. A., & Salam, J. (2021). Social isolation and acceptance of the learning management system (LMS) in the time of COVID-19 pandemic: an expansion of the UTAUT model. *Journal of Educational Computing Research*, *59*(2), 183-208.

[21] Ross, B., Pechenkina, E., Aeschliman, C., & Chase, A. M. (2017). Print versus digital texts: understanding the experimental research and challenging the dichotomies. *Research in Learning Technology*, *25*.

[22] Sahbaz N. K. (2012). Evaluation of reading attitudes of 8th grade students in primary education according to various variables. *Educational Research and Reviews*, 7(26), 571-576

[23] Sahin, S. (2011). The relationship between instructional leadership style and school culture (Izmir Case). *Educational Sciences: Theory & Practice*, 11(4), 1920-1927.

[24] Schöbel, S., Saqr, M., & Janson, A. (2021). Two decades of game concepts in digital learning environments–A bibliometric study and research agenda. *Computers & Education*, *173*, 104296.

[25] Shariza, M and Amelia, A. (2006). Male Teenagers Need for Extensive Reading. [Online]. Available: http://www.iium.edu.my/ilc/?download=16-e08.pdf

[26] Shin, D. H. Shin, Y. J. Choo, H. & Beom, K. (2011) Smartphones as smart pedagogical tools Implications for smartphones as u learning devices. *Computers in Human Behavior*. 27(6), 2207 2214

[27] Sun, J. Y., Han, S H. & Huang, W. (2012). The roles of intrinsic motivators and extrinsic motivators in promoting e-learning in the workplace. A case from South Korea *Computers in Human Behavior* 28(3), 942-950

[28] Tu, X. (2021). The Role of Classroom Culture and Psychological Safety in EFL Students' Engagement. *Frontiers in Psychology*, *12*, 760903.

[29] Weisberg, M. (2011). Student attitudes and behaviors towards digital textbooks. *Publishing Research Quarterly*, 27(2), 188-196. doi:10.1007/s12109-011-9217-4

[30] Woody, W., Daniel, D., & Baker, C. (2010). E-books or textbooks: Students prefer textbooks. *Computers and Education*, 55(3), 1–13.

[31] Yien, J. M., Hung, C. M., Hwang, G. J., & Lin, Y. C. (2011). A game-based learning approach to improving students' learning achievements in a nutrition course. *Turkish Online Journal of Educational Technology*, 10(2), 1-10.

[32] Yoon, J., Kwon, S., & Shim, J. E. (2012). Present Status and Issues of School Nutrition Programs in Korea. *Asia Pacific Journal of Clinical Nutrition*, 21(1), 128-133.