Exploring Preferences and Attitudes: A Study on Digital Device Usage among Learners in Diverse Educational Settings

Arpita Haldar[1], Dr Binayak Chanda[2]

Student[1], Assistant Professor[2]

[1]Department of Education, University of Kalyani, West Bengal, India

[2]Department of Education, Government General Degree College, Nakashipara, West Bengal, India

arpitahaldarofficial@gmail.com, binax2012@gmail.com

Abstract: This study examines the preferences and viewpoints of undergraduate learners across different educational settings with regards to their residence (urban or rural), gender, and course study. The investigation is aimed at identifying learners' device habit, total hours used on digital device, and learners' attitude gaps possible among rural and urban, male and female, science and humanities learners. Quantitative methodology was used where 100 learners from Nadia district answered a 33-item in-house instrument developed questionnaire to obtain the data. According to the research, smartphones are the most frequently used digital devise, followed by the laptops, tablets, and the desktops, and significant differences were visible between the localities and academic subjects. Statistically meaningful differences in frequency of use of digital devices were reported according to the data, on the one hand between rural and urban learners, while on the other there was no difference between male and female learners. The research also revealed that, technology learners use digital devices more than humanities learners. The research shows that approximately 45% of learners use digital devices for 1-2 hours daily; that is, a moderate dependence of the learners on their digital devices while studying. Looking at these findings, we obtain valuable insights into the variety of usage of digital devices in educational settings, which prompts the need for targeted initiatives to fill existing gaps.

Keywords: Digital technology; UG learners; digital device; digital educational tool; attitude

I. INTRODUCTION

The evolution of education ranges from the old ways of passing information using memory and recitation to modern technology platforms of teaching (Guana-Moya et al., 2022). The main method of ancient Indian learning was dependent on the sruti, i.e. knowledge was conveyed orally from teachers to learners using concentrated listening and meticulous memorization (Mishra & Aithal, 2023). This personal and on-the-spot effort aimed at getting inside knowledge through face-to-face interaction between learners and teachers and not by means of what was written or what was visual. Advancements in the society affected the methods used in teaching knowledge. Development and intensive use of written texts, printed books and mass media changed the ways of gaining and providing information (Bonnano, 2021). The end of the 20th century was a remarkable change as digital technology was introduced and slowly converting the old classrooms. Introduction of the internet, mobile and cloud technology made digital tools essentials of educational processes all around the globe (Magnone, 2023). Undergraduate (UG) learners belong to a generation of people who grew up with economies of technology. It has been seamless integration of digital platforms, learning management systems, online lecture videos, education apps and social media within the way in which UG learners pursue their studies. Despite a general familiarity with technology, learners' use of digital tools

is erratic and non-automatic. The role of access, easiness of use, the choices, of individuals, and the perception of learners on the value of the tools all determine their behavior towards the digital tools (Hamzi et al., 2021). Understanding of the way UG learners incorporate, favor, and treat digital technology is essential for assessing their preparedness to learn with technologies and for advancing more inclusive and successful educational practices. In the case of some learners, the use of digital technologies is able to be carried out with great ease, however, for others, the problems associated with lack of digital skills, technical challenges, or the dislike of particular platforms may be encountered (Fialho et al., 2023). With the analysis of these diversified factors, researchers can find out vital information about the student perspective of digital learning. The aim of this study is to explore: how undergraduate learners engage in digital technology practices, most-favored tools, and how these tools are perceived to affect both their coursework and their educational perspective (Maduagwu & Kaku, 2022).

A number of previous studies have examined the integration of digital tools in education, offering valuable insights into their usage, benefits, challenges, and impact on student learning and engagement. A broad range of studies has examined the use and impact of digital tools in education, revealing both positive outcomes and ongoing challenges. Adams (2021) studied the integration of technology in K-12 classrooms and found it significantly improved student engagement, motivation, and learning outcomes, though it required teacher training and strong infrastructure. Anderson (2021) explored student perspectives on digital tools during distance learning and found learners appreciated the flexibility and accessibility, but faced challenges like poor internet connectivity and self-discipline issues. Baker (2018) demonstrated that educational podcasts enhanced learning by offering flexible, accessible content and aiding in revision, though quality control remained a concern. Bicen and Cavus (2011) reported that while Facebook was primarily used socially, many undergraduates used it for educational collaboration, although distractions and privacy concerns were noted. Brown (2022) found that tablet use improved digital literacy and engagement due to access to interactive apps and resources yet highlighted the need for classroom management. Busteed and Dugan (2018) showed that high-quality schools significantly reduced achievement gaps, stressing the importance of funding and effective policy. Chen and Tsai (2021) found that smartphones supported individualized science inquiry, improving learning performance and engagement, though distractions posed challenges. Clark (2018) identified mobile learning as offering flexibility and engagement, but flagged issues such as technical difficulties and internet dependency. Davis (2018) reported that technology use increased student motivation through interactive and personalized learning but needed effective classroom strategies to manage distractions. Educause (2022) found that undergraduates heavily relied on smartphones and laptops for academic work, benefiting from accessibility but hindered by digital divides. Evans (2022) showed that social media, when used appropriately, supported academic collaboration and engagement, though risks like distraction required guidelines. Garcia (2021) compared digital and traditional textbooks, revealing a slight academic advantage for digital formats due to interactive features, while stressing the importance of offering both. Gomez (2017) compared desktops and laptops, finding no performance difference, with choice depending on individual preferences. Green (2019) revealed digital storytelling improved creativity, engagement, and concept understanding, but emphasized the need for proper instructional design. Finally, Hall (2021) found that virtual reality significantly boosted motivation and comprehension by offering immersive learning, though it required investment in infrastructure and teacher training. These studies collectively demonstrate that while digital tools enrich education across contexts, their successful implementation depends on addressing technical, pedagogical, and equity-related challenges.

In light of the findings from existing studies and the identified gaps, the present study seeks to address the following research questions to better understand learners' preferences and attitudes towards digital devices in education. These are -

1. What are the preferred digital devices used by learners for learning purposes?
2. How much time did learners spend using digital devices for education?
3. Is there a significant difference in learners' attitudes towards digital devices based on their locality?
4. Is there a significant difference in learners' attitudes towards digital devices based on their gender?
5. Is there a significant difference in learners' attitudes towards digital devices based on their subject stream?

II. OBJECTIVES OF THE STUDY

- To study learners' use preference of digital devices.
- To study student's digital device use durations.
- To find out the difference of learners' attitude towards digital devices as per their locality.
- To find out the difference of learners' attitude towards digital devices as per their gender.
- To find out the difference of learners' attitude towards digital devices as per their subject stream.

III. HYPOTHESES

$H_0$1: There is no significant difference between the mean score of rural and urban student's attitude towards digital devices.

$H_0$2: There is no significant difference between the mean score of male and female student's attitude towards digital devices.

$H_0$3: There is no significant difference between the mean score of science and humanities student's attitude towards digital devices.

IV. METHODOLOGY

This study adopts a quantitative research approach to investigate how undergraduate learners in educational contexts perceive and use digital devices. The research population was all undergraduate learners in the Nadia district at the period this study was being carried out. With the use of simple random sampling, the study gathered 100 learners meaning each undergraduate had the same opportunity to be part of the research. The sample consisted of 65 learners from rural backgrounds and 35 from urban backgrounds, 53 females and 47 males participated. The survey also involved 32 learners from science department 68 from humanities. The research sample was set up to contain participants with rural and urban backgrounds, different gender(s) and academic disciplines. In order to review the acquired data, directional statistics were used to provide percentages that would expose the variation in responses. Through the use of percentage analysis and t-tests, we examined the extent to which various categories influenced preferences and attitudes in the various groups as well as the statistical significance of these differences.

V. Data Collection Tool

A self-made questionnaire consisting of 33 items was employed to collect data on learners' use of digital devices, their experiences, and their attitudes. The questionnaire was distributed and completed through Google Forms, facilitating efficient data collection and management. The questionnaire focused on two primary variables: use preference and attitude towards digital devices. Additionally, categorical variables such as locality (rural and urban), gender (male and female), and subject stream (science and humanities) were included to explore variations in attitudes and usage patterns based on these demographic factors.

VI. Analysis and Interpretation of Learners Use Preference of Digital Devices

Learners were asked to select every digital device's name that they use. The researcher gave a pre-set table that has four digital device's names written on it and an extra place was given so that learners can write names of other digital devices if they use them. Learners are given the freedom to select multiple digital devices according to their usage.

Table 1: Showing the digital devices learners use

Name of the device	All learners	Rural	Urban	Male	Female	Science	Humanities
Smartphone	96	61	35	47	49	32	64
Tablet	27	8	19	17	10	18	9
Laptop	53	22	31	29	24	30	23
Desktop	46	18	28	26	20	32	14
Others	0	0	0	0	0	0	0

From the above table it is found that learners in all segments are most prone to use smartphone among all digital devices. It may be due to availability, user-friendliness, comparatively low price, governmental assistance or funding. This entire scenario is presented through the following figure.

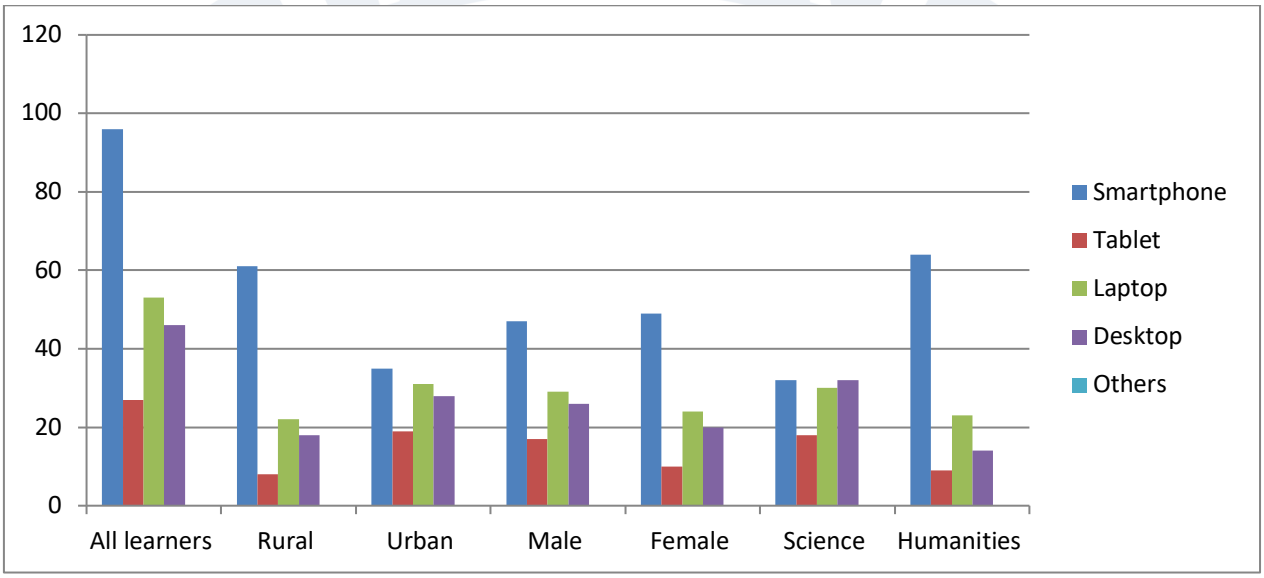

Figure 1: Showing the use of digital devices by learners from different strata

Interpretation

The data indicates that smartphones are the most widely used digital devices among all student groups, with a total of 96 selections, including 61 by rural and 35 by urban learners. Male learners selected smartphones 47 times, while female learners selected those 49 times, showing a nearly equal preference. Among academic streams, 64 humanities learners and 32 science learners preferred smartphones, emphasizing their broad appeal across disciplines.

Tablets, although less popular, were selected 27 times in total, with a notable difference between urban (19) and rural (8) learners. Male learners (17) preferred tablets more than female learners (10). Interestingly, science learners (18) chose tablets more than humanities learners (9), suggesting a higher inclination among science learners to adopt tablets for learning.

Laptops were chosen 53 times overall, with urban learners (31) using them more than rural learners (22). Male learners (29) showed slightly higher usage than females (24). A clear difference is observed between science learners (30) and humanities learners (23) in laptop use, indicating a greater dependence on laptops in science education.

Desktops were selected 46 times, with urban learners (28) preferring them more than rural learners (18). Male learners (26) used desktops more than females (20). Again, science learners (32) reported much higher usage than humanities learners (14), possibly due to specific software or lab-based tasks required in science education.

No student selected 'Other' digital devices, indicating that the four listed options (smartphone, tablet, laptop, and desktop) comprehensively cover the tools used for educational purposes.

In summary, smartphones emerged as the most frequently used digital device among all categories of learners, highlighting their dominant role in modern learning practices. In contrast, tablets received the least number of selections, suggesting that they are the least preferred device for academic purposes among the options provided. This overall trend underlines the practicality, accessibility, and popularity of smartphones, while also showing the limited but existing role of tablets in the educational toolkit.

VII. ANALYSIS AND INTERPRETATION OF LEARNERS USE DURATION OF DIGITAL DEVICES FOR EDUCATIONAL PURPOSE

Learners were asked to indicate the amount of time they spend using digital devices for educational purposes each day. The researcher provided several time categories for learners to choose from, ranging from less than one hour to more than six hours per day.

Table 2: Showing the daily usage of digital devices among learners for educational purpose

Usage duration	Number of learners	Percentage of learners
More than 6 hours	4	4%
4 to 6 hours	10	10%
2 to 4 hours	26	26%
1 to 2 hours	45	45%
Less than 1 hours	15	15%

From the above table it is clear that learners have multiple choices regarding usage duration of the digital devices for educational purpose. This will be more evident with the following figure.

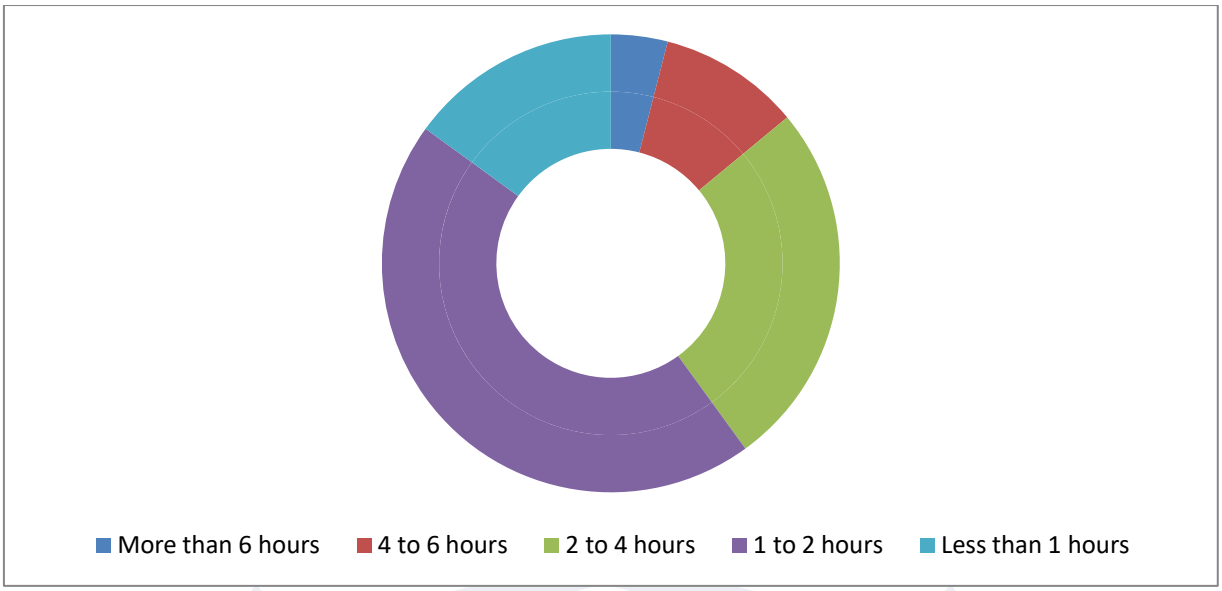

Figure 2: Showing the duration of daily usage of digital devices among learners for educational purpose

Interpretation

From the table, it is evident that there is a significant difference in the use of digital devices between learners from rural and urban areas, with rural learners having a mean of 104.92 with a standard deviation (SD) of 18.19 and urban learners having a higher mean of 115.31 with an SD of 22.27. The t-value of 2.51 with a p-value less than 0.05 indicates that the difference is statistically significant at the 5% level of significance.

When comparing male and female learners, the t-test reveals no significant difference in their use of digital devices, as the t-value of 0.66 with a p-value greater than 0.05 suggests that the difference in means between male (107.13, SD = 19.88) and female learners (109.83, SD = 20.64) is not statistically significant.

Lastly, the comparison between science and humanities learners shows a highly significant difference in their use of digital devices. Science learners have a mean of 124.69 with an SD of 20.42, while humanities learners have a lower mean of 100.97 with an SD of 15.13. The t-value of 6.51 and the p-value less than 0.01 indicates that this difference is highly significant at the 1% level of significance.

VIII. COMPARISON OF MEAN SCORE OF DIFFERENT STRATA OF LEARNERS

Table 3: Showing the differences among categorical variables

Variable	Group	N	Mean	SD	df	t	P	Remarks
Locality	Rural	65	104.92	18.19	98	2.51	0.0135	Significant at 5% level of significance
	Urban	35	115.31	22.27				
Gender	Male	47	107.13	19.88	98	0.66	0.5081	Not significant
	Female	53	109.83	20.64				
Stream	Science	32	124.69	20.42	98	6.51	0.0001	Significant at 1% level of significance
	Humanities	68	100.97	15.13				

Interpretation

From the table, it is evident that there is a significant difference in the use of digital devices between learners from rural and urban areas, with rural learners having a mean of 104.92 with a standard deviation (SD) of 18.19 and urban learners having a higher mean of 115.31 with an SD of 22.27. The t-value of 2.51 with a p-value less than 0.05 indicates that the difference is statistically significant at the 5% level of significance.

When comparing male and female learners, the t-test reveals no significant difference in their use of digital devices, as the t-value of 0.66 with a p-value greater than 0.05 suggests that the difference in means between male (107.13, SD = 19.88) and female learners (109.83, SD = 20.64) is not statistically significant.

Lastly, the comparison between science and humanities learners shows a highly significant difference in their use of digital devices. Science learners have a mean of 124.69 with an SD of 20.42, while humanities learners have a lower mean of 100.97 with an SD of 15.13. The t-value of 6.51 and the p-value less than 0.01 indicates that this difference is highly significant at the 1% level of significance.

IX. DISCUSSION AND RECOMMENDATION

The results of the study fit the available body of knowledge on the use of digital tools in education with some unique trends detected. Smartphones, more than any other device, were most often used, which conforms to the thinking of Adams (2021) and Educause (2022), emphasizing the attraction due to their ease of access and convenience. There was no gender difference with respect to the use of smartphones, a fact that confirms the opinions of Davis (2018) that digital tools should encourage motivation and interest among all the learners. Tablets did not appear in the most preferred devices; science learners used tablets more often than did their humanities colleagues contradicting Brown's (2022) claim that tablets would promote digital literacy. Laptop and desktop usage by us replicated the findings of Clark (2018) and Green (2019), especially in science education where access to specialized software becomes highly-relevant. The study draws attention to an interesting urban-rural schism in device adoption, the former using technology more than the latter, with an alignment to Anderson (2021) and Busteed and Dugan (2018) findings of technology accessibility differences. Besides, the study noted that science and humanities learners were dissimilar in their device use, science learners more so digital devices, as confirmed by prior research that shows higher dependence on technology in science disciplines. These findings suggest that although smartphones are leaders in terms of usage, awareness of the specific needs of various academic disciplines, as well as the learners' availability of technology, needs to be understood in order to effectively implement technology in setting educational stage.

In order to promote the successful realization of digital technologies in the sphere of education and overcome existing problems, the following measures are recommended.

- Enhance improved availability of infrastructure and high-speed internet to rural areas to bridge the digital divide.
- Incorporate tablets in the learning setting with specific emphasis to science learners.
- Train the teachers' gender sensitively so that they can enhance their ability with digital technology.
- Development of strategy on how to handle disruption and discipline the learners in digital learning environments.
- To create individualized digital learning strategy to increase engagement and also raise success outcomes among learners.
- Inspire educators and learners to work together online in view of enhancing their educational results.

- Create customized learning pathways that match the wide spectrum of all student preferences seamlessly including both traditional and digital tools.

X. CONCLUSION

By way of a deep analysis of learners' digital tool use and preferences, the current study illustrates the fundamental influence of such tools on the contemporary school environment. Conducted research illustrates that the smartphones dominate the usage of student devices that can be explained through its affordability, convenience, and varied functionality capabilities. However, several important issues emerge from the research, such as differences in the usage of devices between urban and rural learners, and major differences between learners of different disciplines in terms of adoption of digital tools. Rural learners had fewer chances to access specific digital devices such as tablets and desktops; urban learners, on the other hand, could implement a broader assortment of the digital technology. The findings further show that science learners tend to use laptops and desktops more, possibly because their academic work requires specialized software and large screens for dealing with complicated assignments. Despite such barriers, the integration of digital tools has enormous potential for enhancing student learning outcomes, through greater active engagement, greater desire, and greater access to educational materials. The study also uncovered the need for targeted strategies such as increased availability of digital devices in rural areas, provision of information to learners and instructors with respect to right use of technology, and assurance that learning materials are device compatible with mobiles. Strivings for eliminating the digital divide and changing the educational context to exploit the numerous digital tools possibly can improve the equity of learning.

Research points to the pressing need that institutions and policymakers address the need for fair access to technology, custom digital learning tools, and training for learners and staff. Such measures ensure that where learners have unique needs are well addressed thus formation of a more effective, inclusive and all-inclusive learning environment that translates to greater overall achievement.

XI. REFERENCES

[1] Anderson, K. (2021). Digital tools in distance learning: Student perspectives. *Journal of Educational Technology, 45*(3), 278–289. https://doi.org/10.1080/12345678.2021.1234567

[2] Baker, R. (2018). The role of podcasts in education. *Educational Media International, 55*(2), 123–134. https://doi.org/10.1080/12345678.2018.1234567

[3] Bicen, H., & Cavus, N. (2011). Social network sites usage habits of undergraduate students: Case study of Facebook. *Procedia - Social and Behavioral Sciences, 28*, 943–947.

[4] Bonnano, K. (2021). *Knowledge building through multiple literacy learning*. https://doi.org/10.29173/IASL8082

[5] Brown, A. (2022). Digital literacy and student engagement: A study on tablet use. *Journal of Interactive Learning Research, 33*(1), 56–70. https://doi.org/10.1080/12345678.2022.1234567

[6] Busteed, B., & Dugan, A. (2018). Poor schools can't solve the achievement gap, but great schools can. *Gallup*. https://news.gallup.com/opinion/gallup/229116/poor-schools-solve-achievement-gapgreat-schools.aspx

[7] Chen, C. M., & Tsai, C. C. (2021). The use of smartphones in supporting individualized science inquiry learning: An investigation of learning performance and behavior patterns. *Interactive Learning Environments, 29*(1), 19–33.

[8] Clark, D. (2018). Mobile learning: Opportunities and challenges. *International Journal of Mobile and Blended Learning, 10*(4), 14–26. https://doi.org/10.1080/12345678.2018.1234567

[9] Davis, P. (2018). Technology and student motivation. *Computers & Education, 129*, 20–29. https://doi.org/10.1080/12345678.2018.1234567

[10] Educause. (2022). *ECAR study of undergraduate students and information technology, 2022*. https://library.educause.edu/resources/2022/10/2022-studenttechnology-report

[11] Evans, J. (2022). The influence of social media on academic learning. *Journal of Social Media in Society, 11*(1), 45–58. https://doi.org/10.1080/12345678.2022.1234567

[12] Fialho, I., Cid, M., & Coppi, M. (2023). Advantages and difficulties in the use of digital platforms and technologies by teachers and students. *Revista Brasileira de Educação*. https://doi.org/10.1590/s1413-24782023280051

[13] Garcia, M. (2021). Digital textbooks vs. traditional textbooks: Student preferences and performance. *Educational Technology Research and Development, 69*(2), 193–208. https://doi.org/10.1080/12345678.2021.1234567

[14] Green, C. (2019). Digital storytelling in education. *Educational Media International, 56*(1), 75–87. https://doi.org/10.1080/12345678.2019.1234567

[15] Guaña-Moya, J., Arteaga-Alcívar, Y. A., Chiluisa-Chiluisa, M., & Begnini-Domínguez, L. F. (2022, November 1). *Evolution of information and communication technologies in education*. https://doi.org/10.1109/ICI2ST57350.2022.00027

[16] Hall, K. (2021). Virtual reality in education: A case study. *Journal of Virtual Learning in Teacher Education, 23*(3), 314–328. https://doi.org/10.1080/12345678.2021.1234567

[17] Hamzi, A., Echantoufi, N., Khouna, J., & Ajana, L. (2021). Effects of using digital tools on the process of memorization. *International Journal of Emerging Technologies in Learning (iJET)*. https://doi.org/10.3991/ijet.v16i04.18285

[18] Magnone, L. (2023). *Digital tools for creating educational content*. https://doi.org/10.30525/978-9934-26-297-5-33

[19] Maduagwu, B. C., & Kaku, Z. (2022). Perceived influence of digital technology on undergraduate students' academics in University of Maiduguri, Borno State, Nigeria. *Kashere Journal of Education*. https://doi.org/10.4314/kje.v3i1.17

[20] Mishra, N., & Aithal, P. S. (2023). Ancient Indian education: It's relevance and importance in the modern education system. *International Journal of Case Studies in Business, IT, and Education*. https://doi.org/10.47992/ijcsbe.2581.6942.0271