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# Analysis of integrating Digital Tools on Students Engagement and Motivation at Undergraduate Level: A Mix Method Study

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ABSTRACT

In recent years, the integration of digital tools into educational settings has drastically transformed the teaching-learning process. The technology is becoming an essential part of higher education as learners are increasingly required to engage with digital platforms for learning. The objectives of this study were to examine the use of digital tools on student's engagement and to determine the effect of digital tools on students' motivation to learn at undergraduate level. To gain better understanding this study employed a mix-method approach. Quantitative data was collected through a questionnaire while qualitative insights were gathered through semi-structured interviews. Participants were selected purposively based on their experience with digital tools from 8 female Govt. Graduate Colleges of District Gujranwala. Statistical Packages for Social Sciences (SPSS) software was used for quantitative data analyze. Descriptive statistics applied to the collected data include frequency, percentage, mean, standard deviation while inferential statistics including t-test, correlation and regression were applied to get better understanding. Qualitative data responses were coded and grouped into themes. Results showed that Use of interactive digital apps, online quizzes, availability of video lectures and the flexibility offered by digital tools enhanced their understanding. Immediate quality feedback offered by digital tools made them self-assess their weaknesses and take ownership of their learning. A strong positive correlation was observed among engagement and motivation. Regression analysis shows higher engagement leads to higher motivation while using digital tools for learning. The study concluded that integration of digital tools greatly enhances students' classroom engagement and learning motivation.

**Keywords**: Digital Tools, Motivation, Engagement, Online Learning, Mixed method study, Technological Integration

## Introduction

Technology is considered as a component of modernity in the present world (Caliskan et al., 2019). The use of technology has become an essentiality and not just a free choice today. In accordance with the "We Are Social - Digital 2020 April Global Statshot" report, 50% (4.54 billion) population of world is internet user, 49% (3.80 billion) are using social media platforms, and 67% (5.19 billion) are mobile phone users. These figures illustrate the importance of digitalization in the lives of humans. (Yılmaz, 2021). Society and the education system are being drastically affected by new innovative technologies globally (Walan & Enochsson, 2022).

Zulfa et al. (2023), mentioned that these days, the students are often called as "digital natives" owing to their familiarity and ease with modern tech. Digital tools in different forms are being used in multiple fields (Papetti et al., 2018). These tools involve a variety of resources that are incorporated with technology and are focused on improving teaching effectiveness and enhancing individualized learning experiences (Malos, Pedro & Piedade, 2019).

Rafiq et al. (2024), argued that the digital tool's integration in the learning has become a drastically transformative force, impacting global teaching-learning process greatly. These tools used in education include Learning Management System (LMS), variety of educational apps, virtual laboratories, and multiple other collaborative platforms. LMS platforms like Canvas, Moodle and Blackboard provides organized yet flexible educational environments that supports different types of learning (Alfaruque et al. 2023).

Zoom app (for video conferencing), Microsoft Word (for text related tasks), Microsoft PowerPoint (for generating interactive presentations) are among the most popular Digital tools used in learning process. Bawanti and Arifani (2021), Bothell (2023), Movitaria and Shandra (2020). Some other tools involve LMS (learning management system), kahoot (student activating tool), Facebook (social-media platform) and TechSmith (tool for video production) (Mei. Aas & Medgard, 2019). Wisneski, Ozogul, and Bichelmeyer (2017), discussed that it is up to the perception of the teachers, if they consider technology as valuable, they are more likely to use it into instruction.

The integration of technology and digital tools in learning has drastically improved students learning experiences, making learning more engaging and interesting to them (Alenezi, Wardat & Akour, 2023). Alfaruque et al. (2023), discussed that it also motivates students greatly to integrate technology and online teaching in instructions. It may be due to its creative and interactive formats, availability of digital editions of classics, visualization or visual storytelling. It promotes not only learning but make students think independently to understand deeply what is been taught. Sándor and Gubán (2022), also pointed out that Digital tools and online resources facilitate the improvement of the class environment making teaching more attention grabbing. The research objectives of the study are

1. To examine the use of digital tools in increasing undergraduate student's engagement.
2. To determine the effect of digital tools on students' motivation at undergraduate level.

## Methodology

This study employed a mix-method approach. An explanatory sequential design was used, where quantitative data was collected first using a questionnaire followed by qualitative interviews to further explain the results. Research population of the study involved students of all female Govt. Graduate Colleges of District Gujranwala. A total of 332 undergraduate students of 8 female colleges were selected as the sample for quantitative part while 7 students were selected for interviews.

Purposive sampling was used to select undergraduate students who are more accustomed at using digital tools for learning. Questionnaire was developed to collect data and it was pilot tested to ensure reliability. Alpha value obtained was $\alpha = 0.871$ which ensured good reliability. It was then distributed to collect quantitative data. To add more depth and understanding to the research, Semi-Structured interviews were conducted from 7 participants.

Quantitative data was analyzed using Statistical Packages for Social Sciences (SPSS). Statistical tests including frequency, percentage analysis, mean, standard deviation and t-test were applied. Qualitative data was analyzed using thematic analysis where responses were coded and grouped into themes.

## Data Analysis

Analysis was divided into two parts. First quantitative data was analysed then qualitative themes were generated.

## Quantitative Data Analysis

Analysis of quantitative data obtained through questionnaire shows following major findings.

**Table 1**

*Impact of Digital Tools on Students Engagement*

| | Statements | Mean | S.D |
|---|---|---|---|
| 1 | Learning is more interesting when accompanied by technology. | 4.20 | .736 |
| 2 | Interactive tools enhance my classroom engagement. | 3.83 | .920 |
| 3 | The availability of multimedia resources enhances my understanding of course material. | 4.16 | .737 |
| 4 | Communication tools increases my participation in class discussions. | 3.95 | .935 |
| 5 | Digital tool like MS Word improves my writing efficiency. | 3.81 | .795 |

Table 1 shows student's responses regarding the impact of digital tools on student engagement at undergraduate level. In the first statement the mean value of 4.2 shows that the majority of the respondents agreed that learning is more interesting when accompanied by technology with a standard deviation 0.73 indicating moderate variation in responses. In response to the next statement the mean value 3.83 shows that the majority of the respondents agreed that interactive tools enhance their classroom engagement with a standard deviation of 0.92 indicating moderate variation in responses. When asked that if the availability of multimedia resources enhances their understanding of course material, the mean value 4.16 shows that the majority of the respondents agreed with the statement with a slight deviation of 0.737. in response to the next statement, the mean value 3.95 shows that the majority of the respondents agreed that communication tools increases undergraduate students' participation in class discussions. The standard deviation 0.805 here indicates moderate variation in responses. When students were asked that if a digital tool like MS Word help improves their writing efficiency, the mean value 3.81 shows that the majority of the respondents agreed to the statement with variation of S.D= 0.935.

**Table 2**

*Impact of Digital Tools on Student Motivation to learn*

| | Statements | Mean | S.D |
|---|---|---|---|
| 1 | Real-time feedback using digital tools have enhanced my ability to address learning gaps. | 3.72 | .795 |
| 2 | The flexibility of online learning has allowed me to balance my academic studies with other activities. | 3.70 | .951 |
| 3 | Use of multiple digital tools has improved my learning motivation. | 4.04 | .724 |
| 4 | Using Digital tools motivates me to work on my assignments. | 3.86 | .842 |
| 5 | The flexibility offered by online learning platforms enhances my motivation to learn. | 3.92 | .825 |

Table 2 shows student's responses regarding the impact of digital tools on undergraduate student's motivation to learn. In the first statement the mean value 3.72 shows that the majority of the respondents agreed that real-time feedback using digital tools have enhanced their ability to address learning gaps while the standard deviation 0.795 showed modearate variation. When students were asked that the flexibility of digital tools has allowed them to balance their academic studies with other activities. The mean value 3.7 shows that the majority of the respondents agreed with the statement with standard deviation 0.951 showin variation in responses. In response to the next statement the mean value 4.04 shows that the majority of the respondents agreed that use of multiple digital tools has improved learning motivation with a variation of S.D =0.724. When participants were asked that if digital tools motivate them to work on their assignments majority M=3.86 showed agreed response with a variation of S.D=0.842. In response to the final statement, the mean value 3.92 shows that the majority of the respondents

agreed that the flexibility offered by online learning platforms enhances their motivation to learn with standard deviation 0.824 showing moderate variation in responses.

**Table 3**

| | Variable Sets | Mean | S.D |
|---|---|---|---|
| 1 | Engagement | 3.99 | .592 |
| 2 | Motivation | 3.85 | .576 |

Table 3 shows Mean and Standard deviation of both variable sets. In response to the statements regarding engagement in using digital tools, the mean value of 3.99 shows that majority were agreed with a slight deviation of .592. In response to the statements regarding impact of digital tools on student's motivation to learn, the mean value of 3.85 indicates the positive impact with a slight deviation of .576. So, it is concluded that using integration of digital tools positively impacted undergraduate students' engagement and motivation to learn.

**Table 4**

*Engagement and Motivation comparison among 6th and 8th semester student (t-test)*

| Variable | Semesters | M | S.D | t-value | Sig. |
|---|---|---|---|---|---|
| Engagement | 6th | 3.9191 | .557 | -1.586 | .114 |
| | 8th | 4.0330 | .598 | | |
| Motivation | 6th | 3.7574 | .531 | -2.134 | .034 |
| | 8th | 3.9052 | .578 | | |

Table 4 shows results of independent sample t-test among 6th and 8th semester student regarding their motivation and engagement in using digital tools for learning. Significance value (p value) less than 0.05 indicates a significance difference. Results indicate that there was no significance difference in engagement (t=-2.586, p=114). However, a significant difference (t=-2.134, p=.034) exists in motivation. It shows that students from both semesters vary in their motivation level regarding the use of digital tools in learning.

**Table 5**

*Pearson correlation between Engagement and Motivation in Using Digital Tools*

| Variable Sets | | Engagement | Motivation |
|---|---|---|---|
| Engagement | Pearson Correlation | 1 | .686 |
| | Sig. (2 tailed) | | .000 |
| | N | 332 | 332 |
| Motivation | Pearson Correlation | .686 | 1 |
| | Sig. (2 tailed) | .000 | |
| | N | 332 | 332 |

Table 5 shows Pearson correlation between Students Engagement and Motivation while using Digital Tools for learning. Correlation value of .686 shows a strong positive relationship between engagement and motivation. While Sig. value of .00 (<.001) shows that the result is statistically significant. It is concluded that higher engagement is associated with higher motivation in undergraduate students while using digital tools for learning.

**Table 6**

*Simple linear regression analysis of Engagement and Motivation*

| Variable Sets | Unstandardized Coefficients | | Standardized Coefficients | | | |
|---|---|---|---|---|---|---|
| | B | Std. error | Beta | T | Sig. | $R^2$ |
| Constant | 1.188 | .157 | | 7.566 | .000 | .471 |
| Engagement | .667 | .039 | .686 | 17.137 | .000 | |

Dependent variable: Motivation

Table 6 shows linear regression analysis to examine the impact of Students' engagement on their motivation to learn when digital tools are used for learning. Table shows that engagement significantly predicts motivation (B=.686, p=.000). For every one unit increase in engagement, motivation is increased by .667 units. The table explained 47.1% variance in motivation ($R^2$=.471). So it is concluded that higher engagement leads to higher motivation among undergraduate students while using digital tools for learning.

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**Qualitative Thematic Analysis**

These quantitative findings were further supported by Qualitative responses. Qualitative data was analyzed using thematic analysis where it was coded and grouped into major themes.

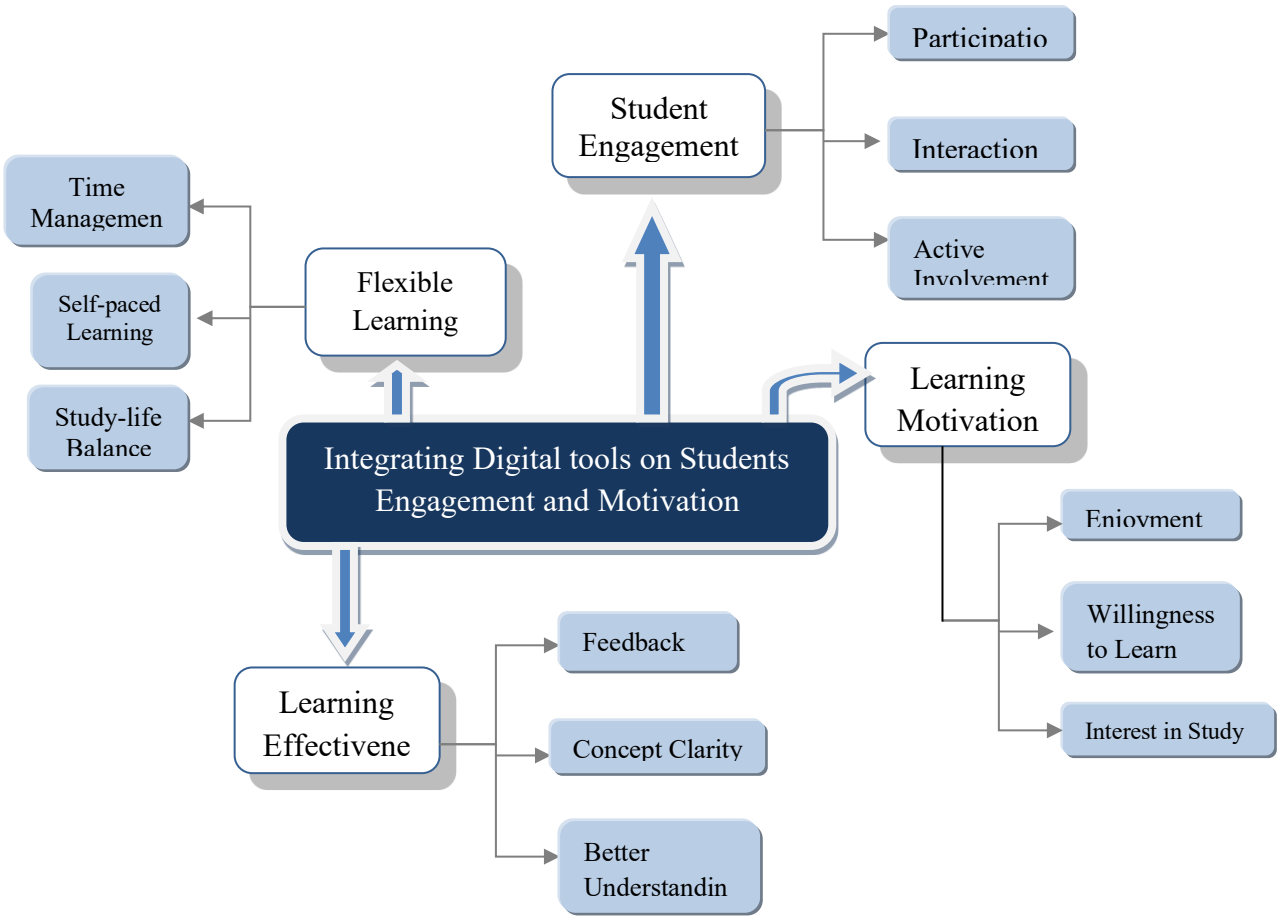


*Figure 1: Themes and Sub-themes*

**Theme 1: Student Engagement**

Participants cited that using digital tools make learning more interesting by providing interactive and engaging content. Use of Video, quizzes or online platforms increases students' participation and encourage them to participate in classroom activities. Participants also share that by using different digital tool in their learning they feel more confident in sharing their ideas and engage more in classroom discussions.

**Theme 2: Learning Motivation**

In term of Motivation to learn, participants reported that using digital tools make learning more enjoyable and interesting. Interactive content, instant feedback and engaging content encourage

them to spend more time on their studies. It develops their interest in learning content. Many participants also mentioned feeling more motivated when using digital tools as compared to traditional methods.

**Theme 3: Learning Effectiveness**

Participants reported that using digital tools in their learning, watching lecture related you tube videos, attempting online quizzes and different interactive platforms to support learning helps in understanding difficult concepts. Participants mentioned that using digital tools improved their understanding of course content greatly while allowing them to identify and correct their mistakes through quick feedback.

**Theme 4: Flexible Learning**

Learning flexibility was identified as an important benefit of using digital tools. Students reported that digital tools allowed them to study at their own pace. It enabled them to manage their time effectively and balance work with other responsibilities. This flexibility allowed by digital tools contributed to flexible and personalized learning experience.

**Research Findings**

1. A majority of 91.5% of the participants agreed about the statement that learning is more interesting when accompanied by technology. Qualitative data also supported this finding as students mentioned feeling more engaged in learning when digital tools are used.
2. A majority of 76.5% of the respondents agreed about the statement that interactive tools enhance their classroom engagement. Interview findings also supported this claim as students believe using digital tools like power point presentations enhanced their classroom engagement greatly.
3. A majority of 91.9% of the participants agreed about the statement that availability of multimedia resources enhances their understanding of course material. This statement was further supported by qualitative data as students reported clear and better understanding with the use of digital multimedia tools for learning.
4. A good majority of 82.8% of the respondents agreed about the statement that communication tools increases their participation in class discussions. Some interviewees reported that using communication tools not only enhanced their participation in class but they feel more likely to share their ideas in class discussions.
5. A good majority of 75.3% of the respondents agreed about the statement that MS words improve their writing efficiency. This finding was strengthened by qualitative finding as students mentioned using MS Word was among one of the most used tool by students and writing assignments on MS Word not only improved their writing skills but they also feel more eager to finish assignments.
6. A good majority of 70.7% of the respondents agreed about the statement that real-time feedback using digital tools have enhanced their ability to address learning gaps. This finding was also strengthened by qualitative data as students reported attaining quick and quality feedback while using digital tools like online quizzes helped with self assessment and overall learning.

7. A good majority of 73.2% of the participants agreed about the statement that flexibility of digital tools has allowed them to balance academic studies with other activities. Interview data also supported this finding as students reported using digital tools, online and video lectures helped them balance their study with other life responsibilities.
8. A good majority of 88% of the participants agreed about the statement that use of multimedia digital tools has improved their learning motivation. Interview finding also shows that learning feel more enjoyable and interesting when digital tools are used. Interactive and engaging content make students learn with interest.
9. A good majority of 78.9% of the participants agreed about the statement that using digital tool like MS Word motivates them to work on their assignments. This finding was further supported by interview results as students showed more interest in completing assignments on MS Word.
10. A good majority of 80.4% of the participants of the study agreed about the statement that the flexibility offered by online learning platforms enhances their motivation to learn. This Finding was further supported by qualitative data as it shows that students feel more motivated and engaged in learning when they can work at their own pace.
11. T-test comparison shows there is no significant difference in engagement (t=-2.586, p=114) among $6^{th}$ and $8^{th}$ semester students. However a significant difference (t=-2.134, p=.034) exists in motivation. It shows that students from both semesters vary in their motivation level regarding the use of digital tools in learning.
12. Pearson correlation between Students Engagement and Motivation while using Digital Tools for learning (=.686, Sig=.00) shows statistically significant result and a strong positive relationship concluding higher engagement is associated with higher motivation in undergraduate students while using digital tools for learning.
13. Regression analysis shows that engagement significantly predicts motivation (B=.686, p=.000) with 47.1% variance in motivation ($R^2$=.471) concluding that higher engagement leads to higher motivation among undergraduate students while using digital tools for learning.

## Conclusion

This study was conducted to analyze the integration of digital tools on students' engagement and motivation. This study used mix-method approach and explanatory sequential design was used for the study. Population of the study consisted of all Govt. female graduate colleges of Gujranwala District. Purposive sampling was employed to collect data from students accustomed at using digital tools. Quantitative data was collected using a 10 statement questionnaire on a 5-point likert scale. Tool was pilot tested to ensure reliability. To support quantitative data, qualitative data was collected using semi-structured interviews. Descriptive statistics including percentage, frequency analysis, mean, standard deviation and inferential statistics including t-test, correlation and regression were used to analyze quantitative data while responses of qualitative data were coded and grouped into themes. This study concluded that majority of the students agreed that digital tools made their learning more interesting and engaging. Use of interactive digital apps, online quizzes, availability of video lectures and the flexibility offered by digital tools enhanced their understanding. Immediate quality feedback offered by digital tools made them self assess their weaknesses and take ownership of their learning. A strong

positive correlation was observed among engagement and motivation among 6th and 8th semester students. Regression analysis shows higher engagement leads to higher motivation while using digital tools for learning. Overall, it can be concluded that integration of digital tools made learning more engaging and students feel more motivated to learn.

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