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Perception of Student - Teachers towards Digital Transformation in Learning Process

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ABSTRACT

This empirical study explores that, the perceptions of student-teachers regarding the digital transformation in educational settings, with a focus on gender and academic stream influences. A stratified random sampling method was employed to select a balanced sample of 100 participants from B.A.B.Ed and B.Sc.B.Ed programs. The researcher was adopted an explanatory sequential research design, utilizing perception scale and interview guide as data collection instruments. Analytical methods included descriptive statistics, thematic analysis, and t-tests. The findings revealed that no significant influence of gender or academic stream on student-teachers' perceptions of digital transformation. Digital tools were found to foster curiosity, critical thinking, and creativity, thereby enhancing the efficacy and quality of the learning experience. The integration of digital resources such as e-portfolios, content-related YouTube videos, and online assessment tools was noted as instrumental in promoting digital transformation. The study identified several challenges faced by student-teachers, including difficulties in creating PowerPoint presentations and Excel worksheets, setting up projectors, and coping with slow internet connectivity. These challenges impeded that the acquisition of comprehensive knowledge and understanding. The research concludes that both student-teachers and educators face similar difficulties in the digitalized learning landscape, underscoring the necessity for improved digital infrastructure and proficiency. The study advocates for the development of foundational digital skills among student-teachers and calls for enhanced ICT facilities to support the digitalization of the educational process.

Keywords: Student-Teacher, Digital Transformation, Learning Process

1.0 Introduction

The emergence of technology has influenced every aspect of human life. Today, a class room without technology is inconceivable. Due to developments and evolutions, standards of learning would be higher in the 21st century then it has been in the 20th century. In order to prepare the students to navigate the 21st century world they must be exposed to technology based instruction in the class room. To be able to survive and be successful in the future school environment, teachers would need to acquire additional knowledge and skills, both general and specific, Teachers play a vital role in realizing the educational goals of a dynamic society.

Digital technologies is an integral part of day to day live across the world and are becoming common in schools and other educational institutions. The current generation of students re digital native who grow up with digital technologies. They are tech-savvy they think and process information differently from

their predecessors. (Bolton, Parasuraman, Hoefnagels, Mychels, & Kabadayi 2013).education system all over the world are rapidly changing to keep pace with the technology and innovation and making through preparations to meet the 21st century students must be able to be to use technology to learn content and skills to that they problems, use information, communicate, innovative and collaborative. Digital transformation is the incorporation of computer-based technologies into an organization's products, processes and strategies. Organizations undertake digital transformation to better engage and serve their workforce and thus improve the ability to compete with fast changing world. Digital technologies and processes enable organizations to adeptly respond to the demands in the present and as demand evolve.

Digital transformation in education is about implementing modern technologies and solutions in educational process in order to enhance teaching and learning experiences for all parties involved. Digital transformation is considered as one of the mega trends in industry and the public sector. In general, digital transformation describes as the shift from traditional (often physical) creation and delivery of customer value, including the operational procedures related to this, into the massive use of digital technologies which enhance or replace the traditional product or services with digitalized ones (Sandukhul & Lehmann, 2017). Technological developments, which greatly affect daily life, bring about global changes and cause radical changes in many areas, including Web2.0, broad internet, mobile technologies, cloud computing, digital media, big data, artificial intelligence, augmented reality, internet of things, 3D printers etc. the effect of technologies on society has been harbinger of new process (Tubitak Bilgem, 2019; Yildiz, 2022).

Theoretical Background

Strategic planning, resource allocation and timeline development are crucial for the seamless integration of digital tools into the curriculum. Faculty and staff training and development play a pivotal role in equipping educators with the skills necessary to facilitate effective online instruction. Continuous monitoring, evaluation and improvement are paramount during the digital transformation process. By prioritizing student needs, aligning strategies with remote learning requirements, and leveraging digital tools effectively educational institutions can ensure the continuity and quality of education (Aammou, Jdidou and Lahiala, 2023). The resources, information systems and organizational structure and culture influence the success of digital transformation and the quality of education service (Aisyah, Nurqamarani, Wulandari and Broto, 2023). The importance of internal and external peers in higher education performance through high levels of student engagement through leadership and a uniformly and developed digitally transformed higher education environment (Nita and Gutu, 2023). In general, in both Early Childhood Education and Primary Education classrooms, Digital Didactic Materials have become valuable tools that teachers consider to enrich the teaching and learning process (Esteve and Gomez, 2023). The implications of digital transformation, particularly in reshaping teaching models and advocating for a hybrid approach encompassing both face-to-face and virtual learning (Barreto et.al, 2023). The tremendous adversities caused by Covid-19 have forced students and lecturers to use digital technologies in tackling learning adversities. Digital transformation has enormously affected higher education which ultimately has led to creation of innovative learning opportunities (Musyoka & Ola, 2023). The indisputable understanding of the importance of digitalization in the field of education by institutions and organizations in the developing world and especially in the pandemic process and in order to realize adaption to this digitization process, it is necessary to start with teacher education, which

is the most important stakeholder of education (Yildiz, 2022). The finding of the study is that using internet in after-school learning activities make them feel more knowledgeable and confident about applying their knowledge to solve problems within and outside the classroom, resulting in high academic success. The students agreed that using the internet in after-school learning activities makes them feel more knowledgeable and confident about applying their knowledge to solve problems within and outside the classroom, resulting in high academic success. The teachers also concluded that the digital learning environment improves students' engagement as they regularly interact with web-based learning tools and are motivated to share their knowledge (Eliwa, 2021)There is a positive correlation between digital pedagogy, student motivation and digital environments. Encourage the scientific community to continue delving into the motivation, collaboration and reflective exchange of experiences, self-learning and promotion of initiative that foster the development of competencies in future teachers (Gomez et.al, 2021). The students enjoyed the digital education and willing to continue it in the future. In addition, students would prefer to use their own devices during on tutorials which allow some changes in the labor environments (Bonandy, Tamas & Toth, 2020). The application of communication technology allows interpersonal communication as well as publishing and sharing technologies are preferred by students to communicate with their teachers (Santosh, Batista & Marques 2019). In the digital transformation process, managers must create a vision to generate and managed accordingly for an effective learning environment (Aydin, Balye & Omer, 2018). In support of the above views Aydin & Omer (2018) conducted a quantitative study on academicians or faculty members by use phenomenological research and semi-structured interview for data collection and found that it is possible that school stakeholders (students) are involved in the transformation process. Santos, Batista & Manques,2019; Bondandy, James & Toth, 2020; Noguera, et al,2020; Elhandeef & Elneil, 2023; Aisyan, Nurquamarani, Mulandari & Broto,2023; Maphosa (2023), Raymod & Ola (2023) and Anammous , Jdidou & Lahila (2023) conducted their research on higher education and adopted quantitative research. They found that the students have positive perception towards digital transformation in learning process, digital transformation in learning process not only affect their learning experience but also their motivation, achievement, engagement and experience. Only Eliwa (2021) conducted his research on secondary education and used mixed method research.

Research Gap

The investigator has gone through many studies and has found that many studies have been conducted on higher education on students and teachers. A few studies have been conducted on teacher education but it is essential to study the perception of student-teachers towards digital transformation in learning process.

Rationale of the Study

The sudden outbreak of COVID-19 that has affected the world's economics has also stifled the education industry. Around 90% of students, that means approx. 1.5 billion students of the world's primary and secondary schools cannot physically attend school. In that crucial time, it helps students to continue their learning; schools were turned into technological learning hub to bridge the gap. Digital transformation in the education sector, however, is not limited to post COVID-19 online learning and education. Some educational institutes and schools have been using technology for past years; the advent of the corona virus pandemic has boosted the process of digital transformation in the education sector.

While education will play a critical role in transformation of society and economy of a nation, technology itself will play an important role in the improvement of educational processes and outcomes; thus relationship between technology and education at all levels is bidirectional (NEP 2020). Digital transformation of learning process helps to improve the learning experience of students, improve engagement to enhance the learning. Digitalization is one of the important elements of the age we are in. There are many studies are conducted on digital transformation but in different context, stakeholders, areas or territories, by using different approach, method, tools and techniques.

Objectives

1. To study the perception of student-teachers towards the digital transformation in their learning process in relation to gender and stream.
2. To find out if student-teachers are equipped with necessary expertise to transform the classroom situation by using digital technology.

Hypotheses

1. There exists no significant difference in the perception of student- teachers in respect to their gender.
2. There exists no significant difference between the perception of student-teachers belonging to Arts and Science stream.

Research Questions

To what extent the student-teachers are equipped with necessary expertise to transform the classroom situation by using digital pedagogy?

Method

The investigator used the mixed method design to conduct this study to know about the perception of student-teachers towards digital transformation in learning process.

Population

All the four-year integrated pupil-teachers of Odisha have been considered as the population for the present study.

Sample and Sampling Procedure

In the present study the sample size will be 100. The sample will be collect through stratified random sampling method. 25 boys and 25 girls were selected from B.A.BED and 25 boys and 25 girls will be selected from BSC.BED students.

Tools Used

The investigator used a self-developed perception scale and interview guide for student teachers. Categorically, the perception scale was used to collect primary data, while interview guide was used for collecting secondary data.

Data Analysis Techniques

Data in this study were analysed both quantitatively and qualitatively in two phases. In the first phase, t-

test used for quantitative data obtained from the perception scale and thematic analysis was subjected to qualitative part which is an important method of qualitative data analysis.

Analysis and Interpretation of the Data

Section 1 explains about the perception of students-teacher towards the digital transformation in their learning process in relation to gender (male and female) and also it tells on the basic of stream (arts and science). Section 2 explains about what are the problems that the student- teacher faces when they are equipped with necessary expertise to transform the classroom situation by using digital technology. Thereafter, data and discussion on whether there is any significant difference in the perception of student teacher in respect to gender and stream. Eventually the data also demonstrate the problems faced by them.

Profile of Participants Involved in the Study

As student teachers are the key beneficiaries of this research outcome, it is imperative to be aware about their profile. Total of 2 universities student teachers had participated in the current study, in which 50 (50%) were male and 50(50%) were female. Further, 50 (50%) of student teachers were B.A.B.ED, while 50 (50%) of students were from B.SC.B.ED as indicated below in Table…..

Table -1.Student Teachers Profile

Variables	**Number**	**Percentage**
Gender		
Male	50	50%
Female	50	50%
Stream		
B.A.B.ED	50	50%
B.SC.B.ED	50	50%

SECTION-1

Distribution Structure of Perception towards Digital Transformation in Learning Process

The basic distribution analysis is performed by estimating the location, scale and shape parameters of the distribution. Location parameter displays the central tendency of the data by means of arithmetic mean. The scale parameter (Standard Deviation) indicates how much the data are dispersed in relation to the mean or central value. Sometimes, the location and scale are fixed but there is a chance of distribution of data to be done side or both sides. Thus, the shape parameter (Skewness and Kurtosis) is needed to find out how data are clustered to one side or scattered to the whole range of distribution.

Table-2: Location, Scale and Shape Estimates of Perception towards Digital Transformation in Learning Process by Student Teachers Gender Wise

Estimates	Digital Transformation in Learning Process	
	Male	**Female**
N	50	50
Mean	117.12	121.44
Std. Deviation	17.131	16.393

Skewness	-1.216	-.245
Skewness of Std. Error	.337	.337
Kurtosis	1.572	-.598
Kurtosis of Std. Error	.662	.662

Table-2.indicates that the value of mean score of perception towards digital transformation in learning process of male and female student teachers are 117.12 and 121.44 respectively. This indicates that mean score of existing perception towards digital transformation in learning process of female student teachers is just higher than the mean score of existing perception of male student teachers. Further, the standard deviation value (17.131) of male teachers is just higher than the standard deviation value (16.393) of female student teachers. This indicates that the standard deviation value of female is so closure to the mean score of existing perception of student teachers towards digital transformation in learning process, while the standard deviation of male student teacher is little less clustered around the mean score of existing perception towards digital transformation in learning process. This implies that female student teachers existing perception towards digital transformation in learning process score is just more consistent than the male student teachers' mean existing perception towards digital transformation in learning process score, as standard deviation value of male student teacher is slightly higher than the standard value of female student teachers. However, overall findings indicate that there is no sharp difference between male and female student teachers with respect to mean and SD of existing perception towards digital transformation in learning process.

The value of skewness and its standard error are -1.216 and .377 respectively for male student teachers. This indicates that distribution is negatively and it is reasonably positioned down after the average performance of male student teachers but outside the range of normality. On the other hand the value of skewness and its standard error are -.245 and .377 respectively for female student teachers but not outside the range of normality.. This indicates that distribution is just negatively skewed and it is reasonably poitioned down before the average performance of female. Similarly, the value of kurtosis and its standard error are 1.572 and .662 for male student teachers respectively.This exhibits that distribution of male student teacher is platykurtic. Further the value of kurtosis and its standard error are -.598 and .662 for female student teachers. This exhibits that distribution of male student teacher is also platykurtic. The probability of male is more flatter than female student teacher, distribution is just broader than the female student teacher but both distribution are considered for normality. To have a better understanding of distribution structure, a visual scrutiny can be done from the Figure….depicted here under.

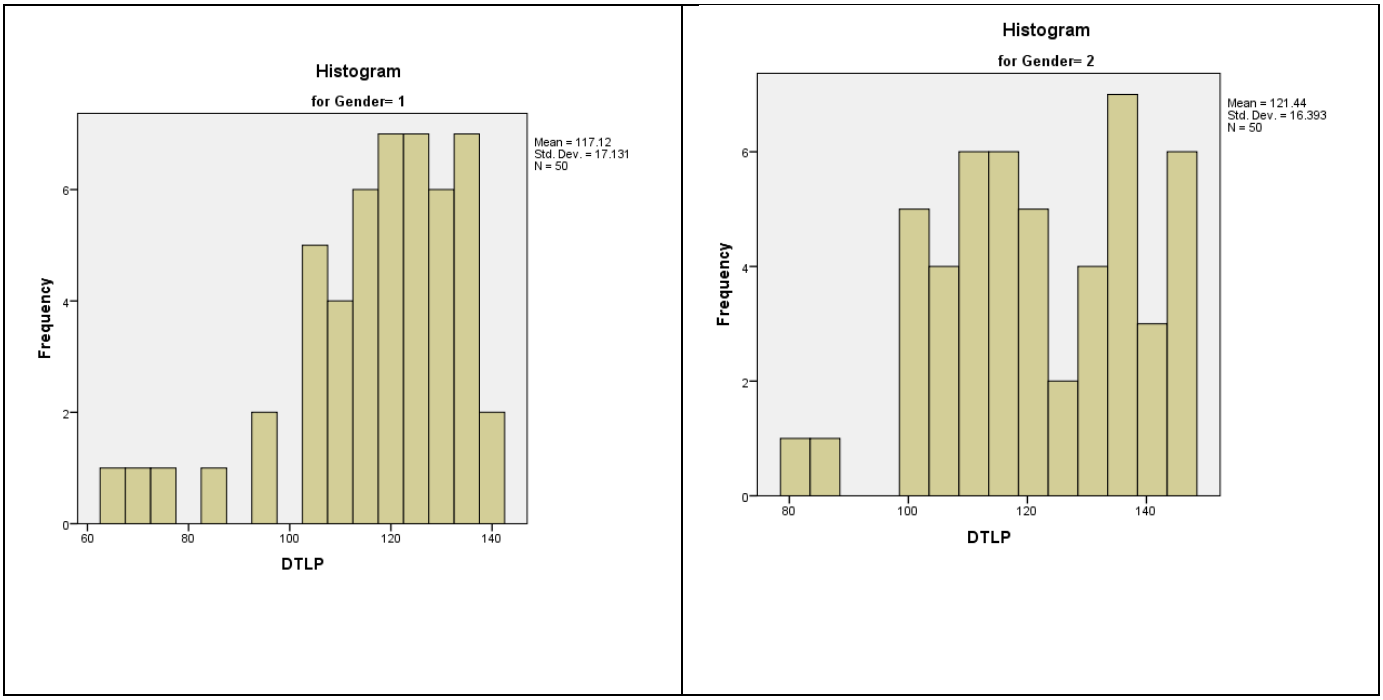


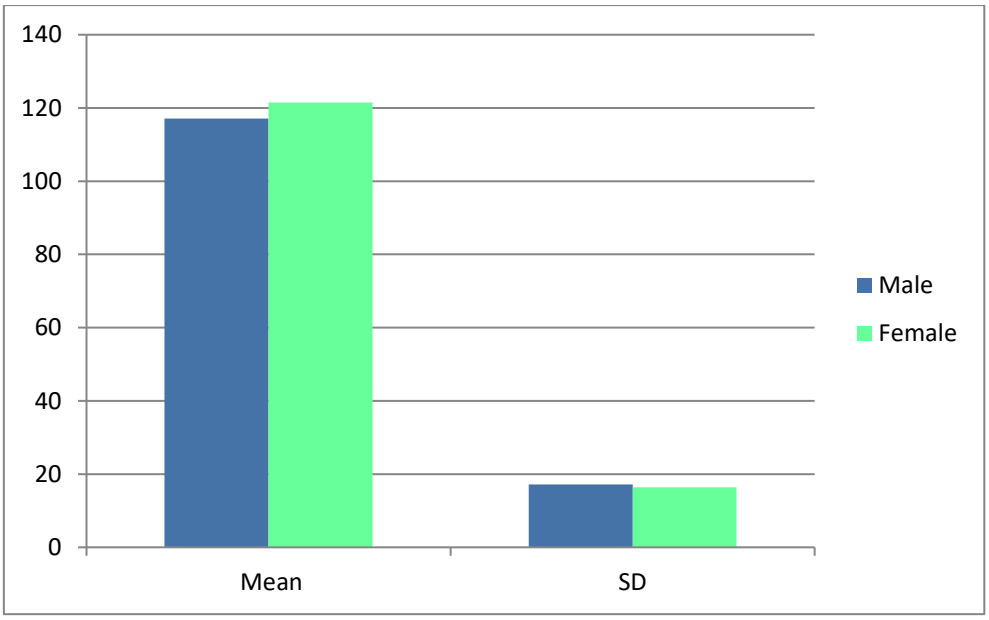
Figure-1.Histogram of Existing Perception of Student Teachers towards Digital Transformation in Learning Process by Male and Female

Table-3: Mean Score Difference in Perception towards Digital Transformation in Learning Process between Male and Female Student Teachers

Gender	N	Mean	SD	SED	df	T-Value	P-value	Remarks
Male	50	117.12	17.131	2.432				
Female	50	121.44	16.393	2.318	98	1.288	0.201	P>.05*

***Not Significant at .05 confidence level**

Table-3.reveals that the mean value of male and female student teachers perception towards digital transformation in learning process are 117.12 and 121.44 with SD 17.131 and 16.393 respectively. The mean of score of female students are higher than male students. The calculated p vale of perception towards digital transformation in learning process of student teachers is 0.201, which is higher than critical value 0.05 level of confidence level with df = 98. It signifies that the null hypothesis state, there exists no significant difference in the perception of male and female student teachers. It may, therefore, be said that male teachers were not found to believe significantly better in perception towards digital transformation in learning process. In other words, it can be said that gender has no influence in perception of both male and female student teachers towards digital transformation.



(Mean difference between the perception of male and female)

Table-3 shows that the female student teachers have more perception than male student teacher of integrated Bed programme. The mean of female students is more than male student but the standard deviation of male is slight more than female student teachers.

Distribution Structure of Perception of Student Teachers towards Digital Transformation in Learning Process of B.A.B.ED and B.SC.B.ED Student Teachers

Tabl-4: Location, Scale and Shape Estimates of Perception towards Digital Transformation in Learning Process by Student Teachers Stream Wise

Estimates	**Digital Transformation in Learning Process**	
Stream	**B.A.B.ED**	**B.SC.B.ED**
N	50	50
Mean	117.68	120.88
Std. Deviation	18.831	14.557
Skewness	-.633	-.784
Skewness of Std. Error	.337	.337
Kurtosis	.179	1.627
Kurtosis of Std. Error	.662	.662

Table-4.indicates that the value of mean score of perception towards digital transformation in learning process of B.A.B.ED and B.SC.B.ED student teachers are 117.68 and 120.88 respectively. This indicates that mean score of existing perception towards digital transformation in learning process of B.A.B.ED is noticeably smaller than the mean score existing perception towards digital transformation of learning process of B.SC.B.ED student teachers. Further, the standard deviation value (18.831) of B.A.B.ED student teachers is just higher than the standard deviation value (14.557) of B.SC.B.ED student teachers. This indicates that the standard deviation value of B.SCB.ED student teacher is so closure to the mean score of existing perception towards digital transformation in learning process, while the standard deviation of B.A.B.ED student teacher is little less clustered around the mean score of existing perception towards digital transformation in learning process. This implies that B.SC.B.ED student

teachers existing perception towards digital transformation in learning process score is just more consistent than the B.A.B.ED student teachers' mean existing perception towards digital transformation in learning process score, as standard deviation value of B.A.B.ED student teacher is slightly higher than the standard value of B.SC.B.ED student teachers. However, overall findings indicate that there is no sharp difference between B.A.B.ED and B.SC.B.ED student teachers with respect to mean and SD of existing perception towards digital transformation in learning process.

The value of skewness and its standard error are -.784 and .377 respectively for B.SC.B.ED student teachers. This indicates that distribution is negatively and it is reasonably positioned down after the average performance of B.SC.BED student teachers but outside the range of normality. On the other hand the value of skewness and its standard error are -.633and .377 respectively for B.A.B.ED student teachers but not outside the range of normality.. This indicates that distribution is just negatively skewed and it is reasonably positioned down before the average performance of B.SC.B.ED. student teacher. Similarly, the value of kurtosis and its standard error are .179 and .662 for B.A.B.ED student teachers respectively. This exhibits that distribution of B.A.B.ED student teacher is platykurtic. Further the value of kurtosis and its standard error are 1.627 and .662 for B.SC.B.ED student teachers. This exhibits that distribution of B.A.B.ED student teachers is also platykurtic. The probability of B.SC.B.ED student teacher is more flatter than B.A.B.ED student teacher which indicates peak of the B.SC.B.ED student teacher distribution is just broader than the B.SC.B.ED student teacher but both distribution are considered for normality. To have a better understanding of distribution structure, a visual scrutiny can be done from the Figure….depicted here under.

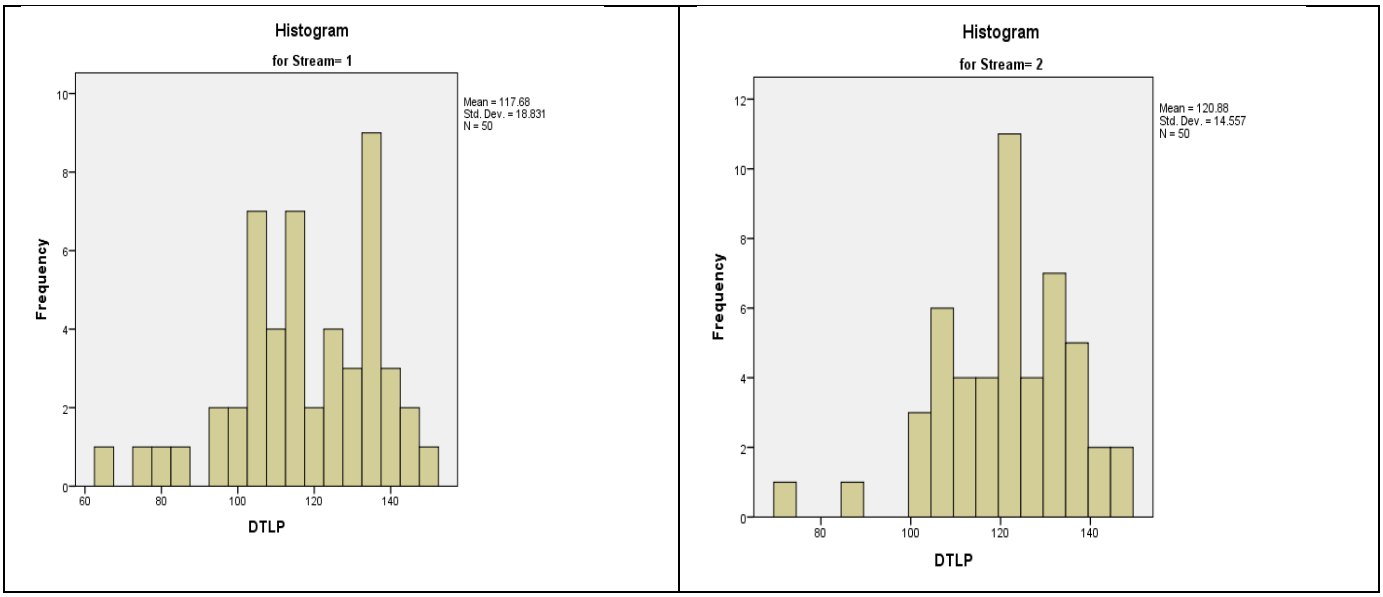


Figure-2: Histogram of Existing Perception towards Digital Transformation in Learning Process by B.A.B.ED and B.SC.B.ED Student Teachers

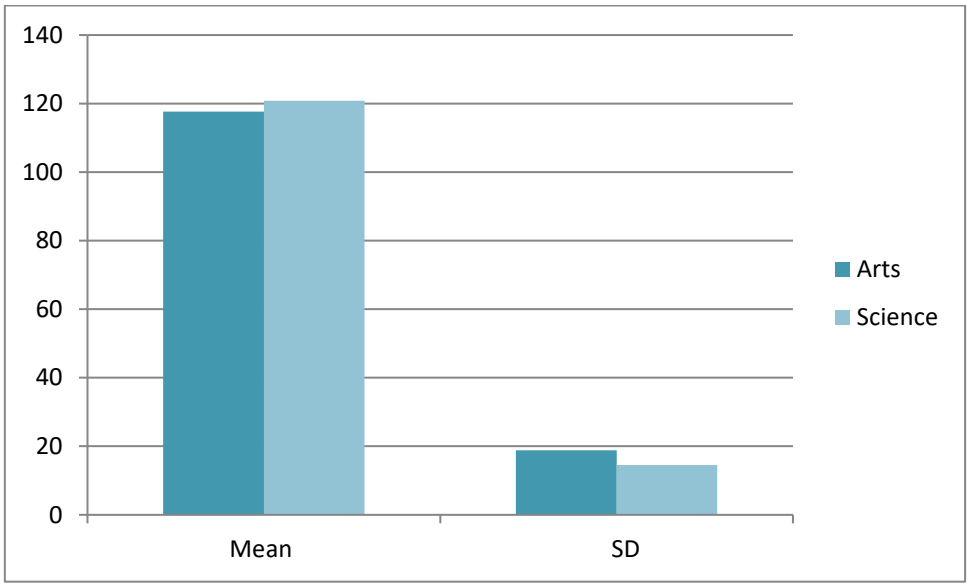
Table-5: Mean Score Difference in Perception towards Digital Transformation in Learning Process between B.A.B.ED and B.SC.B.ED Student Teachers

Stream	N	Mean	SD	SED	df	T-Value	P-Value	Significant
Arts	50	117.68	18.831	2.663				

Science	50	120.88	14.557	2.059	98	0.951	0.344	P>.05*

***Not Significant at .05 confidence level**

Table-5 reveals that the mean value of B.A.B.ED and B.SC.B.ED student teachers perception towards digital transformation in learning process are 117.68 and 120.88 with SD 18.831 and 14.557 respectively. The mean of score of B.SC.B.ED students are higher than B.A.B.ED students. The calculated p vale of perception towards digital transformation in learning process of student teachers is 0.344, which is higher than critical value 0.05 level of confidence level with df = 98. It signifies that the null hypothesis state, there exists no significant difference in the perception of B.A.B.ED and B.SC.B.ED student teachers. It may, therefore, be said that B.A.B.ED student teachers are not found to believe significantly better in perception towards digital transformation in learning process. In other words, it can be said that gender has no influence in perception of both B.A.B.ED and B.SC.B.ED student teachers towards digital transformation.



(Mean difference between Arts and Science stream)

Table-5 shows that the B.SC.B.ED student teachers have more perception than B.A.B.ED student teacher of integrated Bed programme. The mean of B.SC.B.ED students is more than B.A.B.ED student but the standard deviation of B.A.B.ED is slight more than B.SC.B.ED student teachers.

SECTION-2

Student-Teachers are Equipped with Necessary Expertise to Transform the Classroom Situation by Using Digital Technology.

Use of Digital Instruments during Teaching Learning Process

- Digital gadgets play crucial role in teaching learning process and provide clear understanding about content which improve active participation in classroom.
- Use of digital instrument in learning process helps to solve the questions of students and improve their self-confidence.
- Teacher shows motivational videos and stories to motivate the students in their training process.

- Teacher conducts seminars to enable students to improve their knowledge and understanding of a topic by engaging with key issues.
- Use of digital gadgets in teaching learning process leads to develop curiosity, critical thinking , creativity which make the teaching learning process effective and also leads to quality learning.
- Teacher gives suggestion, awareness, and benefits of using technology to promote digital transformation among students in the classroom.
- Integration of e-portfolio, you-tube videos related to content, online assessment tool promote digital transformation in learning process.
- Seminar presentation with the help of PPT leads to promote digital literacy and technology.
- Digital devices are portable which allow the student teachers to take their learning materials in their own pace and time manner wherever they are, leads to promote digital transformation in learning process.
- Use of internet in searching sources of studies and help student teacher to evaluate themselves. In other words it promotes self evaluation.
- It takes away from rote memorization shift towards understanding based learning with more student engagement and deep understanding.
- Smart boards and computers are used in classroom to promote digital literacy among student teachers.
- 3D videos and images are used to help the student teachers in understanding their topic very easily with less time.

Classroom Management

- Teacher promotes the students to ask more and more questions during the learning process.
- The teacher gives example related to the particular questions to make the students clear idea about the content.
- Every teacher takes the questions asked by student teacher in the classroom positively and response clearly to enable in-depth understanding of student teachers.
- The teacher use online information and gives real life situation examples for better and clear insight of a particular subject.
- Question answer sessions and focused group discussion have organized by teachers to promote creativity and critical thinking among student teachers.
- Teachers give clues and hints regarding the answer of their questions not directly tell them the answer, it engages students mind and brainstorming their ideas.
- Teachers have manage the classroom in well organized manner not only cleared the doubts but also prepare the students for the next part or topic.
- Due to lack of sufficient time student teacher are not got in-depth understanding, which create a big drawback in the digital transformation in learning process.

Discussion

The current study was carried out in Sambalpur and Cuttack district of Odisha. The purpose of the study was to investigate the perception of student teacher towards digital transformation in learning process. The study is based on the critical review of related literature was conducted and the research gap was

established on the perception of student teachers regarding digital transformation in learning process. To grasp the perception of student teachers, the study was guided by two objectives namely: to study the perception of student-teachers towards the digital transformation in their learning process in relation to gender and stream and to find out if student-teachers are equipped with necessary expertise to transform the classroom situation by using digital technology.

To achieve the research objectives above, both quantitative and qualitative approaches were employed. Specially mixed method research involving explanatory sequential design was employed in the study to enable the researcher to come up with valid findings. The quantitative data was gathered from Gangadher Meher Univrsity, Sambalpur and Ravenshaw University, Cuttack. Specially, the data were collected from 4th year integrated Bed students only. Further, self-made perception scale was used as research instrument for getting the appropriate data relating to the objectives. Finally, qualitative data were analysed by using thematic analysis while the quantitative data were analysed by using t-test to know the mean difference among the perception of student teachers towards digital transformation in learning process.

The Main Findings of the Study

The major findings that emerged from the current study were presented based on the research objectives stated above.

- From the above study, it has revealed that stream and gender have no influence on the perception of student teachers towards digital transformation in their learning process.
- Use of digital gadgets in teaching learning process leads to develop curiosity, critical thinking , creativity which make the teaching learning process effective and also leads to quality learning.
- Integration of e-portfolio, you-tube videos related to content, online assessment tool promote digital transformation in learning process.
- Create awareness about authentic websites and harmful website among the student teacher, so that they use as per need without any fear.
- Digital transformation in teaching learning process helps to develop self-conscious, and improve the strength of students.
- Develop the basic knowledge, skills and understanding about use of digital devices during learning process among student teachers.
- Well developed infrastructure like ICT lab, smart classroom is required for digitalization of learning process.
- Student teacher has faced challenges in preparing PPT and presentation in their pre-active or planning stage and interactive phase during their internship programme.
- BSC.BED student teachers faced complication in construct worksheet in Excel for the purpose of completion of their assigned project or assignment.
- They have faced problem regarding setting up the projector and cable which may create a hindrance in their interactive learning situation.
- Due to slow internet speed, student teachers faced so many problems in their learning process through digital mode.
- Because of lack of sufficient time student teachers are not got the in-depth knowledge and understanding.

- Lastly the study found that not only the students but also the teachers are gone through the same problem in the process of teaching and learning.

5.3 Conclusions

This study intended to investigate the perception of student teachers towards digital transformation in their learning process. Based on the analysis of the data obtained from the field, it shows that there is no significant difference in the existing level of perception between male and female B.A.B.ED and B.SC.B.ED students in their learning process. Therefore, it may have more positive perceptions about digital transformation in learning process. There is no significant difference in existing level of perception between the B.A.B.ED and B.SC.B.ED students in their digital transformation of learning process. Students are facing problems related technology access like to slow internet speed, have not the basic knowledge about technology, how to use and where to use those technologies and also due to lack of time for feedback mechanism create obstacle in the digital transformation in learning process.

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