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Teachers' Perception and Challenges in Integrating Educational Technology in Secondary School Education

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The relationship between education and technology has become inseparable in the modern era. The integration of Educational Technology in schools has now become a central focus of educational reform and innovation. With the development of technology, the teaching-learning process has undergone significant improvement. At the same time, education fosters creativity and skill development related to technological advancements. Teachers play a central role in integrating educational technology, as they are the ones who implement the curriculum and shape the learning experience. The commitment, competency, and professional training of the teachers are pivotal for effective inclusion of educational technology. The present study focuses on exploring perception of teachers on integration of educational technology in real classroom situations. It also aims to examine the challenges they face during its implementation. Through this study, an understanding of the teachers' attitudes towards using educational technology will be explored. The researchers will also get insights into the teachers' competence in using technology.

Keywords: *Educational technology, Teachers, Perception, Challenges*

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I. INTRODUCTION

Educational technology has emerged as a transformative force in contemporary schooling, reshaping teaching- learning processes and expanding access to quality education. It is the systematic useofdigitaltools,platforms,andresourcesintheteaching and learning process. According to Todino (2025), "Educational technologies refer to the set of digital tools, resources, applications, and methodologies used to facilitate the teaching–learning process." Educational technologyis theintegration ofacademic theories with technologytools to make the learning process effective and achieve optimal results. It aims to enhance the teaching learning process by promoting active participation, collaboration, critical thinking, and problem-solving. It includes a broad range of applications such as computers, projectors, speakers, smartboards, simulations, virtual laboratories, learning management systems, artificial intelligence, etc.

Inthistechnologicalera,wherenewdigitaltoolsarebeingdevelopeddailyandeverythingcanbe accessed at our fingertips, technology has become an integral part of our lives. It is being incorporated in every field. From clearing small doubts to learning new skills, we depend solely on technology. In our everyday life, it has also become difficult to operate without technology. Technology has changed the aspect of our lives. From smartphones to online education and healthcare,technologyispartofnearlyeverythingwedo.Peopleusedigitalplatformsforlearning, work, shopping, banking, and staying connected. This has made life easier and more productive, but it has also created a strong dependence on technology in our daily routines.

Educational Technology helps in enhancing the cognitive development of an individual. Incorporating educational technology into scientific classes hasbeenshowntoenhancestudents'conceptualunderstandingandknowledgeacquisition(Herga, Grmek, &Dinevski, 2014; Gunawan, Nisrina, Surayanti, Herayanti, &Rahmatiah, 2018). Teachingwith blendedmethod,multimedia,andsimulationshasbeenfound toimprovestudents'motivation, academic performance, and attitude towards science (Shah & Khan, 2015; Badarne, 2019;Akgunduz&Akinoglu,2016).Technologieslikeaugmentedrealityandvirtualrealityhelp inimprovingthoselearnerswithlearningdisability(Turan&Atila,2021;Azis&Cantafio,2023). Research has shown that teachers mostly use PowerPoint and animations, and use less sophisticated technologies like simulation,because of a lack of training and resources (Açıkalın, 2014; Obaydullah& Rahim, 2019).

II. SIGNIFICANCE OF THE STUDY

The teacher plays a vital role in the integration of educational technology in the teaching and learningprocess.Theyaretheoneswhoaregoingtomanagetheclassandguidethestudents.The attitude of teachers towards the use of technology and how much confidence they have in using technology will lead to effective integration of educational technology in the teaching-learning process. Research has shown that teachers generally hold a positive perception of the integration of technology in schools. Studies have repeatedly revealed that teachers are generally positive regarding the infusion of ICT in the schools; however, they also have encountered challenges. Research shows that most oftheteachersbelieve in thepotential of ICT for enhancing efficiency inteachingandlearning;ontheotherhand,theyoftenfaceproblemslikeinfrastructuredeficiency, insufficient training, and Technical Support (Khan & Alwi, 2018; Acharya, 2023). For instance, Mathematics teachers appreciated the role of ICT in promoting classroom effectiveness, but stressed the importance of ongoing training in this area and infrastructure availability. Also, Adedokun (2018) found that instructors were confident in technology use but were inhibited by barrierssuchaspoorinternetconnection,limitedtraining,andinsufficientinfrastructure.Inamore recentwork,Obispo(2023)pointedtothefactthatteachers'positiveattitudestowardstechnology are deeply related to the availability of infrastructures, training, and institutional support.

The resultssuggesttheimportanceofcontinuoustraining,theimperativeofsufficientsupport,andthe organisationofourICTineducationprogrammeforthesuccessfulintegrationofICTineducation.

InthecontextofManipur,althoughtherearestillmajorinfrastructureandteachertrainingissues, studiesonICTintegrationineducationshowthatbothstudentsandinstructorshavepositiveviews toward technology (Yumnam, 2021; Anal &Naraginti, 2022; Singh, 2024). The perception and competencies of teachers towards such innovations significantly influences students learning. The growing emphasis on digital learning tools has brought a paradigm shift in the traditional teaching and learning methods. Therefore, it is necessary to find out whether there exist a significant difference in the perception of secondary school teachers regarding the inclusion of technological asset and the challenges they faced across gender and academic streamspecifically in Manipur.

III. OBJECTIVE

1. Tocomparetheperceptionofsecondary-levelteacherstowardstheintegrationof educational technologyin the classrooms across gender and academicstream in Manipur.
2. To compare the challenges faced by secondary-level teachers in integrating educationaltechnology in the classroom across gender and academic stream in Manipur.

IV. HYPOTHESES

$H0_1$:Thereisnosignificantdifferenceintheperceptionofteacherstowardstheintegrationof educational technology in the classroom based on gender.

$H0_2$:Thereisnosignificantdifferenceintheperceptionofteacherstowardstheintegrationof educational technology in the classroom based on academic stream.

$H0_3$: There is no significant difference in the challenges faced by teachers in the integration ofeducational technology in the classroom based on gender.

$H0_4$: There is no significant difference in the challenges faced by teachers in the integration ofeducational technology in the classroom based on academic stream.

METHODSANDPROCEDURE

The purpose of this studyis to assess the teachers'perceptions about the integration of educational technology in the classroom and the challenges they face during its implementation. Quantitative method is employed in the current study. In this study, primary data source was gathered to achieve the information. Thepopulation of the studyconsisted of secondary-level teachers teachingclasses 9 to 12 in the Imphal-West and Imphal-East districts of Manipur. A cross-sectional survey was employed to collect the data for the study.Conventional sampling method was adopted for the selection of the sample. Statistical analysis techniques include descriptive statistics and the independent samples t-test.

V. RESULTSAND DISCUSSION

Table1.
MeanDifferencesofPerceptionbetweenMaleandFemaleteachers;Artsand Science Teachers

Variables	Gender/ Stream	N	Mean	Std. Dev.	Variability test(p)	t	df	Sig. (p)
Perception	Male	52	56.65	5.65	0.50	0.87	102	0.39
	Female	52	55.71	5.40				
	Arts	51	55.47	5.63	0.78	1.29	102	0.20
	Science	53	56.87	5.37				

ThisanalysisgavethedetailedmeandifferencesinPerceptionbetweenmaleandfemaleteachers, arts and science stream teachers, drawinginsights from the table provided above statistical table. The table presents data for teachers based on gender and streams, comparing male and female teachers,and arts andscienceteachers across severalstatisticalmeasures,includingmeanscores, standard deviations, and t-test results.
BothmaleandfemalegroupsforPerceptionconsistof52teacherseach,withmaleteachershaving ameanandstandarddeviationperceptionscoreof56.65±5.65,whilefemalestudentshaveamean and standard deviation perception score of 55.71±5.40.The p-value for the variability test (Levene's test for equality of variances) is 0.50. Since this value is greater than 0.05, it suggests that the variances between male and female perception scores are not significantly different, allowing for the use of a standard independent samples t-test.
ForPerception, thecalculatedt-valueis0.87,whichissmallerascomparedtotablet-t-valueof 1.98at102 degreesof freedomforthiscomparisonat asignificancelevelof 0.05.
Further,thecalculatedp-valueforthet-testis0.39,whichisgreaterthanthesignificancelevelof 0.05taken for this study. So, there is no statistically significant difference in perception scores between male and female teachers.
Forstream,thesamplesize(N)forArtsteacherswas51,withameanscoreof55.47andastandard deviation of 5.63. The sample size (N) for Science teachers was 53, with a mean score of 56.87 and a standard deviation of 5.37.
The variability test (p) for perception was 0.78, suggesting no significant difference in variance betweenthetwogroups.Thecalculatedt-valuewas1.29,whichissmallerascomparedtotablet- t-valueof1.98at102degreesoffreedomforthiscomparison,andthesignificancelevel(Sig.(p)) was 0.20. Sincethep-value(0.20)is greaterthan theconventional alphalevel of0.05, thereis no statistically significant difference in perception between Arts and Science stream students. Although Science students had a slightly higher mean perception score (56.87 vs. 55.47), this difference is not statistically significant.
A higher mean score typicallyindicates a morepositive or strongerperception.Fromtheabovetable,thissuggeststhat,onaverage,maleandfemalestudents hold similar perceptions regarding the measured construct considered for this study. Giventhatperceptiondoesnotshowsignificantdifferencesbetweenmaleandfemaleteachersand artsandscienceteachers,thepracticalimplicationisthatinterventionsorsupportsystemsdesigned to address these areas might not need to be gender and stream-specific.

Table2.
MeanDifferencesofChallengesbetweenMaleandFemaleteachers,andArtsand Science Teachers.

Variables	Gender/Streams	N	Mean	Std. Dev.	Variability test(p)	t	df	Sig. (p)
Challenges	Male	52	44.75	5.50	0.89	0.50	102	0.62
	Female	52	44.21	5.48				
	Arts	51	44.24	4.51	0.15	0.45	102	0.66
	Science	53	44.72	6.29				

This analysis of the mean differences in challenges between Male and Female teachers, Arts and Sciencestreamteachers,isbasedontheprovidedTable2.Thetablepresentsstatisticaldata, includingsamplesizes,meanscores,standarddeviations,variabilitytestresults,t-values,degrees of freedom, and significance levels for two key variables: Perception and Challenges.
The statistical values for both male and female groups for challenges consist of 52 teachers each. Male teachers have a mean and standard deviation challenge score of 44.75±5.50, and female teachers have a mean and standard deviation challenge score of 44.21±5.48.
The p-value for the variability test is 0.89. This value, being greater than 0.05, indicates that the variances of challenge scores between male and female teachers are not significantly different. The calculated t-value is

0.50at 102 degrees of freedom for this comparison, which is smaller as comparedtotablet-t-valueof1.98at102degreesoffreedomforthiscomparisonatasignificance level of 0.05.
Additionally, the calculated p-value for the t-test is 0.62. With a p-value of 0.62, which is well above the 0.05 significance level, there is no statistically significant difference in the challenges reported or experienced by male and female teachers. This implies that both genders face comparable levels or types of challenges.
For streams, the sample size (N) for Arts teachers was 51, with a mean score of 44.24 and a standarddeviationof4.51.Thesamplesize(N)forScienceteacherswas53,withameanscoreof
44.72and astandard deviation of 6.29.
The variability test (p) for challenges was 0.15, indicating no significant difference in variance betweenthetwo groups.Thet-valuewas0.45,whichisalsosmallerascomparedtotablet-value of 1.98 at 102 degrees of freedom for this comparison, and the significance level (Sig. (p)) was 0.66.
With a p-value of 0.66, which is much greater than 0.05, there is no statistically significant differenceinthechallengesfacedbyArtsandSciencestreamteachers.Scienceteachersagainhad
aslightlyhighermeanchallengescore(44.72vs.44.24),butthisdifferenceisalsonotstatistically significant.
A higher mean score might indicate a greater number or intensity of challenges perceived. Given that challenges do not show statistically significant differences between male andfemaleteachersandartsandscienceteachers,thepracticalimplicationisthatinterventionsor
supportsystemsdesignedtoaddressthese areas mightnotneedtobe gender andstream-specific. The analysis indicates that while there are slight numerical differences in the mean challenge scores between Arts and Science stream teachers, these differences are not statisticallysignificant. This suggests that, based on this data, teachers face challenges in a largely similar manner, with no significant distinctions that can be attributed to their academic stream.

VI. CONCLUSION

Results of this study revealed no gender (male and female) or academic background (arts and science)baseddifferenceamongtheperspectivesandchallengesperceivedbytheteacherstowards educational technology integration. This indicates that teachers irrespective of gender and streams, have similar experiences in technology uptake in the secondary classroom.

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