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Utilisation Of Artificial Intelligence In Teaching Efficacy Of Prospective Teachers: An Analytical View

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ABSTRACT

In current era, Artificial Intelligence (AI) is an emerging, innovative and speedy development digital technology. The application of AI has become more and more obvious technology in education, especially teaching and learning activities. The uses of AI in education can assist teachers to enhancing their teaching efficacy for effective teaching. AI is promoting the teaching efficacy among teachers for meaningful instruction, efficient classroom activities and quality of teaching. Also it helps to improve the students' adaptive learning and online learning activities. The aim of the study is to ascertain the level of use of uses of AI in teaching efficacy of prospective teachers. A survey method was used for data collection through questionnaire (Utilisation of artificial intelligence in teaching efficacy). The samples of 300 prospective teachers were selected by stratified random sampling technique. The samples were studied in B.Ed., colleges of Education of Namakkal district, Tamil Nadu. The questionnaire was consists of 40 statements based on the Likert scale. The responses were 'always' (3), 'often' (2) and 'sometimes' (1). The findings of the results revealed that the prospective teachers have high level of utilisation of AI in teaching efficacy. Also, the study found the results showed that there is no significant difference in utilisation of AI in teaching efficacy among prospective teachers with respect to their categorical variables such as gender, locality of prospective teachers, medium of instruction, stream of subject, age, computer knowledge and AI used in teaching. The suggestion of the study is the prospective teachers are using the AI in teaching it enhance to effective teaching efficacy in their classroom activities.

Keywords: Prospective Teacher, Teaching Efficacy, Artificial Intelligence (AI), Utilization.

INTRODUCTION

Artificial Intelligence (AI) is an intelligent behavior it assists to achieve specific goals in educational institutions. It is an emerging innovative technology in teaching and learning process. Also, it is most popular technology in current scenario with integrating to help make easy daily tasks both for official and personal uses in teaching on learning. In educational field, especially higher educational institutions have integration of digital technology for teaching and learning noted by Thoring et al. (2017). Although, artificial intelligence has helps to enhancing the teaching efficacy among teachers. Baimuldina et al. (2019) reported that the smart technology is essential for teachers' professional development to produce quality educational resources for teaching performance. AI is produce savvy teachers in educational sectors, and it produce knowledge based society and citizens. Addition, AI is a digital technology has the ability to process multi tasks in education. According to Pozo et al. (2021), digital technology has become the mediator of all education.

In educational field, the teachers are the vital role in teaching process; they should have effective teaching activities in their classroom. Teacher efficacy beliefs and refer to the extent to which teachers believes they have the capability to positively affect student achievement (Gibson and Dembo, 1984). Student achievement has also been shown to be significantly related to teacher efficacy (Ashton and Webb, 1982). It refers to a teacher's belief in their ability to influence student learning and engagement even with difficult or unmotivated students. High teaching efficacy is associated with greater effort, persistence and open mindedness in using new teaching methods with innovative digital technology.

AI has numerous sources for teaching and learning process. AI is an online learning platforms, it helps prepare to good lesson plans, teaching and learning materials. According to Adebowale, (2025) said that AI is to sources for visual resources such as audio resources, audio visual resources and hyper media resources to integrate in education, in order to facilitate achieving learning goals. AI is promote the inclusive and productive learning activities with the high effectiveness, it provide high transformative learning engagements to the learners because the technology could adapt to individual learners needs. According to Chen et al. (2021) suggested that AI is possible to identify the cognitive and emotional needs of learners. Therefore, AI in teaching efficacy is connecting to better teaching effectiveness, student engagement and their achievement. It helps to motivate the teachers for job involvement and job satisfaction. It is also a crucial activity among teachers in understanding their teaching effectiveness and their teaching competencies.

OBJECTIVES OF THE STUDY

- To find out the level of utilisation of artificial intelligence in teaching efficacy among prospective teachers is high.
- To find out the significant difference in utilization of artificial intelligence in teaching efficacy among prospective teachers with respect to their following categorical variables such as gender, locality of prospective teachers, medium of instruction, marital status, computer knowledge and Artificial Intelligence (AI) used in teaching.
- To find out the significant difference in utilisation of artificial intelligence in teaching efficacy among prospective teachers with respect to their stream of subject and age.

HYPOTHESES OF THE STUDY

- $\boldsymbol{H_1}$: The level of utilisation of artificial intelligence in teaching efficacy among prospective teachers is high.
- $\boldsymbol{H_0 2}$: There is no significant difference in utilization of artificial intelligence in teaching efficacy among prospective teachers with respect to their following categorical variables such as gender, locality of prospective teachers, medium of instruction, marital status, computer knowledge and Artificial Intelligence (AI) used in teaching.
- $\boldsymbol{H_0 3}$ **:** There is no significant difference in utilisation of artificial intelligence in teaching efficacy among prospective teachers with respect to their stream of subject and age.

METHODOLOGY OF THE STUDY

The study employed a descriptive survey method (Quantitative approach) for describe the "utilisation of artificial intelligence in teaching efficacy among prospective teachers'.

POPULATION, SAMPLE AND SAMPLING TECHNIQUE

The research population consists of prospective teachers who are studying in Colleges of Education in Namakkal district of Tamilnadu, India. The samples 300 prospective teachers were selected through the stratified random sampling technique.

RESEARCH INSTRUMENT OF THE STUDY

In the study, the investigator used questionnaire (Likert type - Three point scale) for measured the "Utilisation of artificial intelligence in teaching efficacy". The tool was developed by the researcher and research supervisor. The tool was consists of 40 statements, the Cronbach's alpha method was used to found the internal consistency of reliability of the tool was 0.82 and the content validity was applied.

DATA COLLECTION AND STATISTICAL ANALYSES OF THE STUDY

For the study, the investigator collected the data from prospective teachers who were studied in Colleges of Education in Namakkal district of Tamilnadu, India. The study has been adopted both statistical analyses such as descriptive (Mean and SD) and inferential analyses ('t' and 'F' test) with the help of SPSS (version 22) software.

TESTING OF HYPOTHESES

H_1 : The level of utilisation of artificial intelligence in teaching efficacy among prospective teachers is high.

Table No: 01

Level of utilisation of artificial intelligence in teaching efficacy among prospective teachers

Maximum Score : 120

Sl.No.	VARIABLES	SUB VARIABLES	N	MEAN	SD
1	Gender	Male	102	95.18	5.11
		Female	198	94.30	5.52
2	Locality of Prospective Teacher	Rural	192	94.88	5.32
		Urban	108	93.94	5.57
3	Medium of Instruction	Tamil	104	94.89	5.67
		English	196	94.35	5.29
4	Marital status	Married	94	94.27	5.30
		Unmarried	206	94.56	5.47
5	Computer Knowledge	Yes	243	94.55	5.40
		No	57	93.68	5.56
6	Artificial Intelligence used in teaching	Yes	64	94.94	5.37
		No	236	93.49	5.44
7	Stream of Subject	Language	82	94.26	5.63
		Arts	78	93.62	4.94
		Science	140	94.71	5.58
8	Age	Below 25	202	94.68	5.42
		25-30	52	93.65	5.73
		30 Above	46	92.82	4.45
		Average	**N=300**	**94.27**	**5.38**

From the table (1) is showed that the calculated mean value 94.27 is greater than the mid score 60 of maximum score (120). Consequently the calculated mean value is high. Hence, the result concluded that the prospective teachers have high level of utilisation of artificial intelligence in teaching efficacy.

$H_0 2$: There is no significant difference in utilization of artificial intelligence in teaching efficacy among prospective teachers with respect to their following categorical variables such as gender, locality of prospective teachers, medium of instruction, marital status, computer knowledge and Artificial Intelligence (AI) used in teaching.

Table No.: 02

significant difference in utilisation of artificial intelligence in teaching efficacy among prospective teachers with respect to their categorical variables

Sl.No.	VARIABLES	SUB VARIABLES	N	MEAN	SD	't' - Value	'p' – Value
1	Gender	Male	102	95.18	5.11	1.31	0.52
		Female	298	94.30	5.52		
2	Locality of Prospective Teacher	Rural	192	94.88	5.32	1.43	0.43
		Urban	108	93.94	5.57		
3	Medium of Instruction	Tamil	104	94.89	5.67	0.81	0.3
		English	196	94.35	5.29		
4	Marital status	Married	94	94.27	5.30	0.12	0.33
		Unmarried	206	94.56	5.47		
5	Computer Knowledge	Yes	243	94.55	5.40	0.05	0.83
		No	57	93.68	5.56		
6	Artificial Intelligence used in teaching	Yes	64	94.94	5.37	0.46	0.84
		No	236	93.49	5.44		

From the table (2) inferred that the calculated 't' values 1.31 (gender), 1.43 (locality of prospective teachers), 0.81 (medium of instruction), 0.12 (marital status), 0.05 (computer knowledge) and 0.46 (Artificial Intelligence used in teaching) are less than the table value 1.96 at 0.05 level of significant. Consequently, the null hypothesis is accepted, because the hypothesis is statistically not significant. Hence, the result of the study is revealed that there is no significant in utilisation of artificial intelligence in teaching efficacy among prospective teachers based on their following categorical variables such as gender, locality of prospective teachers, medium of instruction, marital status, computer knowledge and artificial intelligence used in teaching.

$H_0 3$: There is no significant difference in utilisation of artificial intelligence in teaching efficacy among prospective teachers with respect to their stream of subject and age.

Table No: 03

Significant difference in utilisation of artificial intelligence in teaching efficacy among prospective teachers with respect to their stream of subject and age

Sl. No.	VARIABLES	SUB VARIABLES	N	MEAN	SD	'F' – value	'p' – value
1	Stream of Subject	Language	82	94.26	5.63	0.18	0.83
		Arts	78	93.62	4.94		
		Science	140	94.71	5.58		
2	Age	Below 25	226	94.68	5.42	1.20	0.30
		25-30	52	93.65	5.73		
		30 Above	22	92.82	4.45		

From the table (3) is inferred that the calculated 'F' value 0.18 (stream of subject) and 1.20 (age) are less than the table value 2.98 at 0.05 level of significance. Consequently, the null hypothesis is accepted, because the hypothesis is statistically not significant. Hence, the result of the study is revealed that there is no significant difference in utilisation of artificial intelligence in teaching efficacy among prospective teachers based on following categorical variables such as stream of subject and age.

FINDINGS OF THE STUDY

From the statistical analyses were revealed that the results were,

- The prospective teachers have high level of utilization of artificial intelligence in teaching efficacy.
- There is no significant difference in utilisation of artificial intelligence in teaching efficacy among prospective teachers with respect to their following categorical variables such as gender, locality of prospective teachers, medium of instruction, stream of subject, age, computer knowledge and artificial intelligence used in teaching.
- There is no significant difference in utilisation of artificial intelligence in teaching efficacy among prospective teachers with respect to their stream of subject and age.

DISCUSSION

The study was discussed based on the results were revealed that the categorical variables wise analysis described the significant difference in utilisation of artificial intelligence in teaching efficacy among prospective teachers.

First the descriptive analysis wise result was found that the prospective teachers have high level of utilization of Artificial Intelligence in teaching efficacy. According to Nasir, M et al. (2024) stated that the use of AI in education is continuously evolving, effective teaching and learning and outcomes. Also, the application of AI was provided personalised learning experiences stated by Shum et al. (2019). Similarly, according to Ying Dong and Bingyuan Min (2024) reported that the AI tools enhancing teaching efficacy.

Second, the inferential analyses wise results were revealed that the male prospective teachers (95.18) are greater than the female prospective teachers (94.30) in utilisation of AI in teaching efficacy.

Chun Mei Chou et al (2023) explained that the male prospective teachers had a higher innovative teaching perception of the application of AI teaching then female prospective teachers. The locality of prospective teachers showed that the rural area prospective teachers (94.88) are better than the urban area prospective teachers (93.94) in uses of AI in teaching efficacy.

Likewise, the role of artificial intelligence tool has improving the teaching efficiency suggested by Dong,Y., and Min.B (2024). The medium of instruction wise analysis indicated that the Tamil medium prospective teachers (94.88) are superior to English medium prospective teachers (94.35) in utilisation of AI in teaching efficacy. Next, marital status wise analysis noticed that unmarried prospective teachers (94.56) are slightly difference in uses of artificial intelligence in teaching efficacy than married prospective teachers (94.27).

Consequently, the computer knowledge wise analysis explored that the prospective teachers who have high computer knowledge (Yes - 94.55) in using of AI in teaching efficacy than the prospective teachers who have low computer knowledge (No – 93.68). Then, the artificial intelligence used in teaching wise analysis showed that the prospective teachers who are AI used in teaching (Yes - 94.94) are better than the prospective teachers who are AI used in teaching efficacy (No - 93.49).

Addition, the stream of subject wise analysis revealed that the Science discipline prospective teachers (94.71) are greater than the Language (94.26) and Arts (93.62) disciplines prospective teachers' uses of AI in teaching efficacy. Finally, the age wise analysis indicated that the below 25 age group prospective teachers (94.68) are superior to the prospective teachers who are the age group 25-30 (93.65) and the following age group above 30 (92.82) in uses of AI in teaching efficacy. Therefore, the results were suggested that the utilisation of Artificial Intelligence (AI) in teaching efficacy is high level of effectiveness in teaching and enhancing the better teaching efficacy.

CONCLUSION

The study on "Utilization of Artificial Intelligence in teaching efficacy of prospective teachers" has provided the result was high level of utilization of Artificial Intelligence in teaching efficacy among prospective teachers.

Based on the findings, it can be concluded that the artificial intelligence technology knowledge is incorporate the normal teaching method in classroom, it assisted to promote the effective teaching activities among prospective teachers, to enhance the innovative technical knowledge in their delivery of lessons, to provide the effective teaching, environment and to accelerate the efficient learning activities among learners. Consequently, the Artificial Intelligence (AI) helps teachers to improve their comprehensive or understanding the mastery level knowledge. Also, AI assists students to enhance their personalized learning activities and good academic achievement.

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