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Knowledge Of Teachers Of Computer Science In Arts And Science Colleges In Kerala On Ai, Ar, And Vr

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Abstract

Lower- or higher-education students always desire an enjoyable, dynamic, active, and vivid learning environment. Technological development and its assistance in education help offer a dynamic learning environment. Digitalization in education also brings drastic changes to the educational scene. The latest trends are artificial intelligence, augmented reality, and virtual reality. This study focuses on the extent of computer science faculty knowledge of applying the latest digital trends in education. One hundred fifty computer science faculties were selected as the sample for this study. The researcher developed the knowledge Inventory of Computer Science Faculties on AI, AR, and VR. The collected data were subjected to statistical analysis to test the formulated hypothesis. An independent sample t-test and an ANOVA were applied to the data. The study found that gender, locality of the respondent, educational qualification, and the faculty's teaching experience do not have a differential effect on their knowledge of AI, AR, and VR.

Keywords: Artificial intelligence, augmented reality, computer science teachers, higher education, knowledge, virtual reality

Introduction

Technology has become an integral part of human life. Technological developments result from humans' desire to make life smoother and more manageable. This era is termed the digital era, as the present era witnesses the digital revolution.

Background of the Problem

The quick development of digital technology and its use in everyday life are bringing about numerous changes in every industry. Compared to prior times, the needs of the digital age are slightly different. Also relevant are the students' needs. Higher education must be better equipped to satisfy students' need for a cutting-edge, captivating, and enjoyable learning environment. They prefer a more active learning atmosphere versus lectures and chalk-and-board instruction.

Here is where the significance of VR and AR technology is revealed. While VR substitutes a computer-simulated fictitious world for the real world, AR mixes the digital world with reality (TeamViewer, 2022). Anyone who owns a smartphone can easily access augmented reality. Augmented reality (AR), which projects virtual visuals and characters through a phone's camera or video viewer, turns the natural environment into a colorful, visually appealing one (Baun, 2020). The use of augmented reality only serves to improve the user's perception of the outside environment. Virtual reality requires more types of equipment like glasses. It gives a fictional experience. One can see the ocean, space, and such things in a 360-degree format with VR technology. Augmented reality, on the other side, brings the fictional world to the real world. This has been used in the medicine, the army, etc. Including AR and VR will surely arouse the student's interest (Opriş, 2022). The AR- and VR-integrated learning environment can make the sessions more interactive, especially since the learners will study with more interaction and utmost interest (Cabero-ALmenara, 2019).

Statement of the Problem

The study is entitled "Knowledge of Teachers of Computer Science in Arts and Science Colleges in Kerala on AI, AR, and VR."

Objectives of the study

The following objectives were formulated for the study:

1. To find whether there exists any significant difference in the knowledge of teachers of computer science in Arts and Science colleges in Kerala on AI, AR, and VR with respect to their gender
2. To find whether there exists any significant difference in the knowledge of computer science teachers in Arts and Science colleges in Kerala on AI, AR, and VR with respect to their type of management.
3. To find whether there exists any significant difference in the knowledge of teachers of computer science in Arts and Science colleges in Kerala on AI, AR, and VR with respect to their educational qualification

Hypothesis of the Study

1. There exists no significant difference in the knowledge of computer science teachers in Arts and Science colleges in Kerala on AI, AR, and VR with respect to their gender.
2. There exists no significant difference in the knowledge of computer science teachers in Arts and Science colleges in Kerala on AI, AR, and VR with respect to their type of management.
3. There is no significant difference in the knowledge of computer science teachers in Arts and Science colleges in Kerala on AI, AR, and VR with respect to their educational qualifications.

Material and Methods

The researcher found the survey method apt for proceeding with this research. The necessary data for this research were collected using the tool entitled 'Knowledge Inventory of Computer Science Faculties on AI, AR, and VR,' which was prepared and validated by the researcher. Expert opinion helped much in each stage of the development of the tool. One hundred fifty teachers who handle the computer science stream of various arts and science colleges in Kerala were selected as samples for this study (Table 1). With the prior permission of the authorities, the researcher distributed and collected the data from the respondents. The data was tabulated and subjected to statistical analysis in light of the formulated hypothesis. The inferential statistics applied in this study were tests of the significance of difference in the two independent mean and ANOVA.

Table 1

Sample Distribution

Sub Sample		*n*	*N*
Gender	Female	85	150
	Male	65	
Type of Management	Aided	61	150
	Government	45	
	Self-Financing	44	
Educational Qualification	PG	53	150
	M.Phil.	30	
	Ph.D.	67	
Teaching Experience (in Years)	0-5 Yrs	45	150
	6-10 Yrs	53	
	11-15 Yrs	39	
	More than 15 Years	13	

Results and Discussion

The result of the preliminary analysis and inferential analysis is discussed further.

Preliminary Analysis of the Scores

Table 2 summarises the descriptive analysis done with the scores obtained for the teachers' knowledge of artificial intelligence, augmented reality, and virtual reality.

Table 2

Descriptive Statistics of the Knowledge of Computer Science Teachers on AI, AR, and VR

	Knowledge in Artificial Intelligence	Knowledge of Augmented Reality	Knowledge in Virtual Reality
N	150	150	150
Mean	119.26	130.70	127.85
Median	117.00	129.50	125.00
Mode	112.48	127.10	119.29
Std. Deviation	6.24	5.00	8.64
Skewness	1.052	.521	.627
Kurtosis	.066	-.336	-.871

Table 2 shows that for a sample of 150 computer science teachers, the mean, median, and mode obtained for the knowledge in artificial intelligence are 119.26, 117.00, and 112.48. 6.24 is obtained as the value of the standard deviation. The skewness and kurtosis are obtained as 1.058 and .066, respectively. The value of skewness shows that the distribution is positively skewed. Figure 1 gives a graphical representation of the score distribution.

Figure 1

Distribution of the Score of Knowledge of Computer Teachers' of Kerala on Artificial Intelligence.

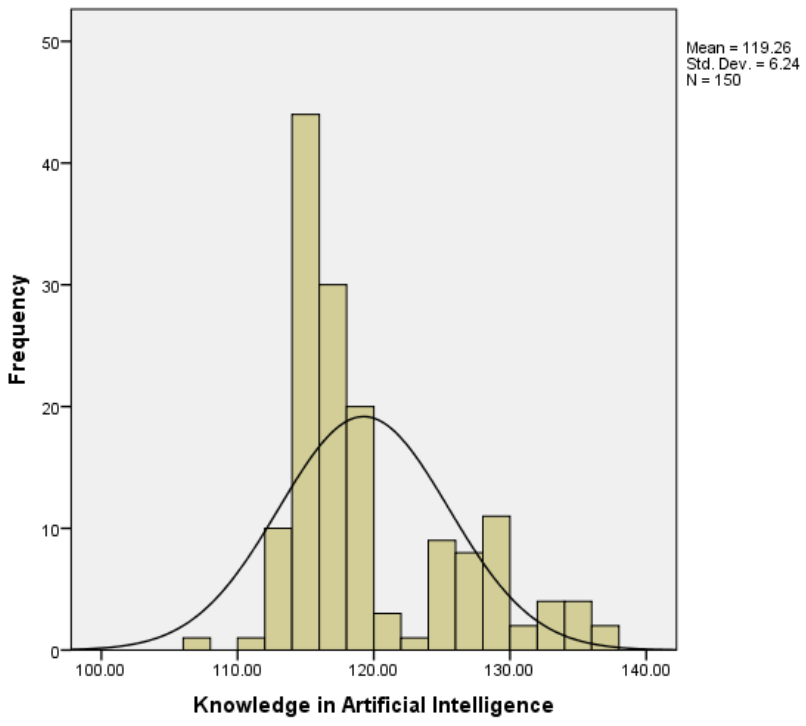


Table 2 also records that for the selected computer science teachers, the mean, median, and mode obtained for the knowledge in AR are 130.70, 129.50, and 127.10. The value of the standard deviation is obtained as 5.00. The skewness and kurtosis are obtained as .521 and -.336, respectively. A graphical representation is presented in Figure 2.

Figure 2

Distribution of the Score of Knowledge of Computer Teachers' of Kerala on Augmented Reality

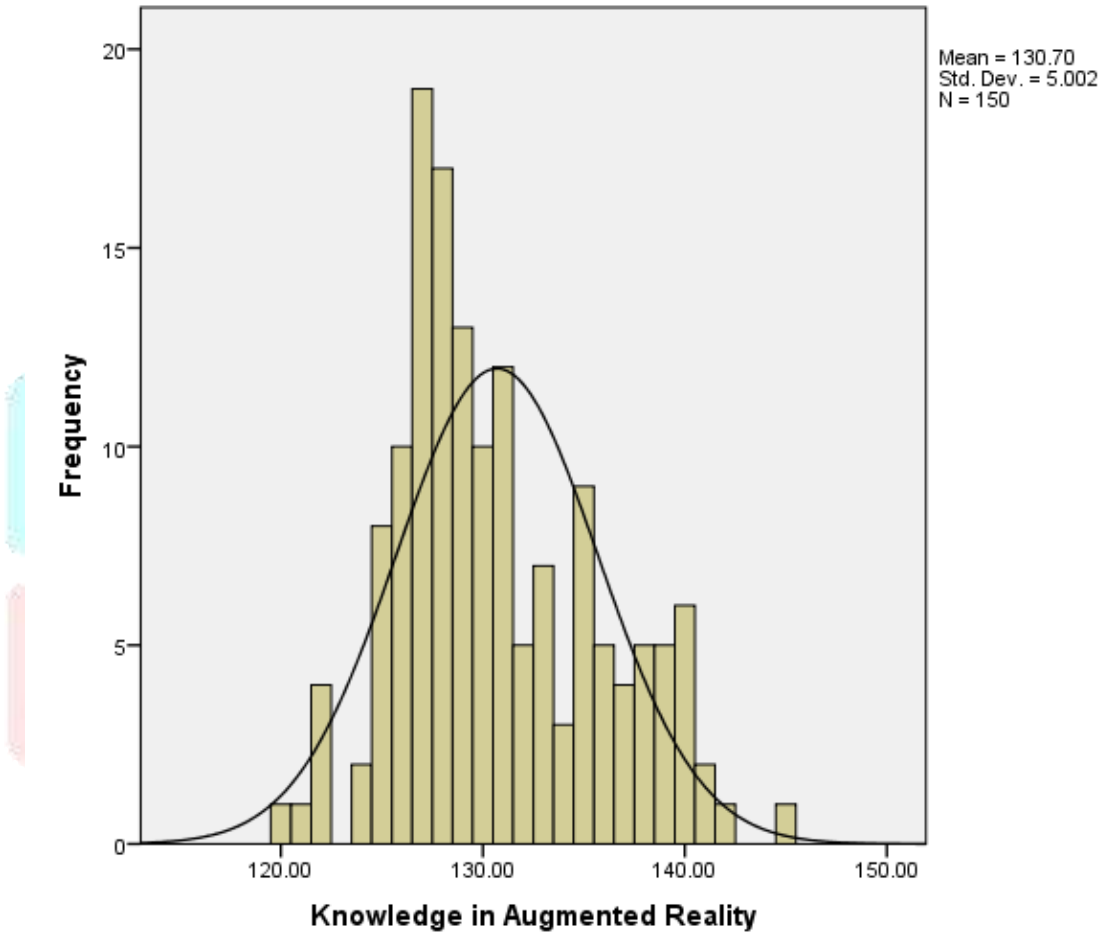
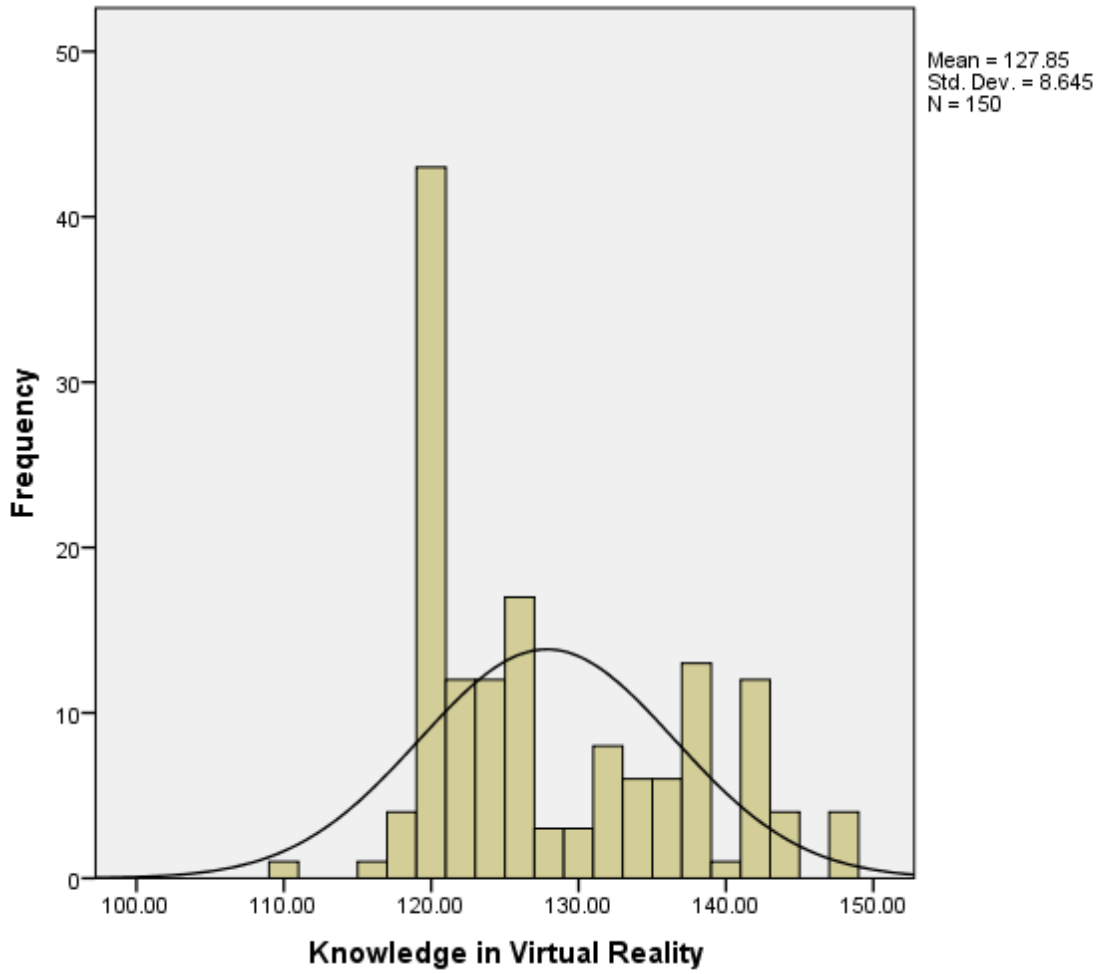


Table 2 says that for a sample of 150 computer teachers, 127.85, 125.00, and 119.29 are noted as the mean, median, and mode of the score distribution of the knowledge of computer teachers in Virtual Reality. .287 and .631 are obtained as the values of skewness and kurtosis. Figure 3 gives a representation of the data distribution of virtual reality.

Figure 3

Distribution of the Score of Knowledge of Computer Teachers' of Kerala on Virtual Reality



Discussion. The values of central tendencies and dispersion show that the distribution of the knowledge score of computer teachers of Kerala on AI, AR, and VR in education tends to be normal.

Significance of difference in the knowledge of teachers of computer science in Arts and Science colleges in Kerala on AI, AR, and VR with respect to their gender

An independent sample t-test was used to determine the differential effect of gender on the knowledge of computer teachers of arts and science colleges in AI, AR, and VR. Table 2 records the result of the t-test.

Table 2

Test of Significance of Difference in the Mean Scores of Knowledge of Teachers of Computer Science in Arts and Science Colleges in Kerala on AI, AR, And VR With Respect to Their Gender

Variable	Gender	*n*	*M*	*SD*	*t*	*p*
Knowledge in AI	Female	85	119.15	6.09	.240	.811
	Male	65	119.40	6.46		
Knowledge in AR	Female	85	130.80	4.83	.279	.781
	Male	65	130.57	5.25		
Knowledge in VR	Female	85	128.06	8.73	.332	.740
	Male	65	127.56	8.59		

The t value for the significance test of the difference between the mean scores of teachers' knowledge of artificial intelligence, Augmented reality, and virtual reality is 0.240, .279, and .332, respectively. As the obtained t-values are less than the table value 1.96, it can be said that the difference in the mean score is not significant at the .05 level of confidence. Hence, Hypothesis 1 is accepted.

Significance of difference in the knowledge of teachers of computer science in Arts and Science colleges in Kerala on AI, AR, and VR with respect to their type of management

The result of the ANOVA employed is displayed in Table 3

Table 3

Test of Significance of Difference in the Mean Scores of Knowledge of Teachers of Computer Science in Arts and Science Colleges in Kerala on AI, AR, And VR With Respect to Their Type of Management

Variable	Type of Management	*n*	*M*	*SD*	*F*	*p*
Knowledge in AI	Aided	61	119.07	5.55	.522	.594
	Government	45	118.76	6.77		
	Self-Financing	44	120.05	6.62		
Knowledge in AR	Aided	61	130.66	5.00	.109	.897
	Government	45	130.49	5.36		
	Self-Financing	44	130.98	4.72		
	Aided	61	127.16	8.36	.645	.526

Knowledge in VR	Government	45	127.60	8.97
	Self-Financing	44	129.85	8.64

According to Table 3, the F value obtained for the test of significance of the difference in the mean score of teachers' knowledge in AI, AR, and VR when classified based on the type of management of the institution is 0.522, 0.897, and 0.645, respectively. All three F values obtained are less than the Table value (Table R) at a .05 significance level. Thus, it can be concluded that the difference in the mean score is not significant. Hence, Hypothesis 2 is accepted.

Significance of difference in the knowledge of teachers of computer science in Arts and Science colleges in Kerala on AI, AR, and VR with respect to their Educational Qualification

The result of the ANOVA employed is displayed in Table 4

Table 4

Test of Significance of Difference in the Mean Scores of Knowledge of Teachers of Computer Science in Arts and Science Colleges in Kerala on AI, AR, And VR With Respect to Their Educational Qualification

Variable	Educational Qualification	*n*	*M*	*SD*	*F*	*p*
Knowledge in AI	PG	53	119.32	6.22	.551	.578
	M.Phil	30	118.23	6.17		
	Ph.D.	67	119.67	6.33		
Knowledge in AR	PG	53	130.13	4.63	.752	.473
	M.Phil	30	130.50	5.37		
	Ph.D.	67	131.24	5.13		
Knowledge in VR	PG	53	128.06	8.67	.101	.904
	M.Phil.	30	128.27	10.00		
	Ph.D.	67	127.51	8.08		

Table 4 records the result of ANOVA to determine whether the educational qualifications of the computer science teachers have any effect on their knowledge of AI, AR, and VR. The result shows that the F value obtained for AI, AR, and VR knowledge is .551, .752, .101, respectively. As the obtained F value is less than the Table value at the .05 level of significance, it can be said that the difference in the mean score is not significant at the .05 level of confidence. Hence, the third hypothesis is also accepted.

Findings of the Study

The researcher came to the following conclusions after analyzing the data under the hypothesis:

1. There exists no significant difference in the knowledge of teachers of computer science in Arts and Science colleges in Kerala on AI, AR, and VR with respect to their gender
2. There exists no significant difference in the knowledge of computer science teachers in Arts and Science colleges in Kerala on AI, AR, and VR with respect to their type of management.
3. There exists no significant difference in the knowledge of computer science teachers in Arts and Science colleges in Kerala on AI, AR, and VR with respect to their educational qualifications.

Educational Implications

Applying artificial intelligence, AR, and VR in higher education can bring an exciting element to the daily lessons. Studies show that higher education students need to learn what the application of AR and VR can bring to the learning scenario. Since it is undeniable that digital technologies can have a miraculous impact on education, it is vital to treat them seriously. The teachers should be competent to integrate AR and VR technologies into the daily learning environment.

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Author Contributions

The author is the only contributor to this work and permits for publication.

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Declaration of Interest

The author declares that the author does not have any competing interest

Data Availability

The data can be made available on request.

Reference

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