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AN INDELIBLE LINK BETWEEN LEARNING AND TECHNOLOGY

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ABSTRACT

How Information and Communication technology that includes; Computer skills, Desktop Presentation Program, Heating Ventilating and Air Conditioning, Assessment Agent System, E-learning, learning from Television, and M-learning affect the academic achievements of the students.The Purpose of this research is to examine the factors of Information and Communication technology (Computer skills, Desktop Presentation Program, Heating Ventilating and Air Conditioning, Assessment Agent System, E-learning, learning from Television, and M-learning) that are associating and impacting the academic achievements of the students. Structured questionnaire was distributed among 357 students to collect the data. For this Correlation and Regression Analysis were applied. The results show that five variables (computer, assessment agent system, e-learning, television, and m-learning) of ICT have a strong association whereas there is no association with desktop presentation program and heating ventilating & air conditioning. Secondly computer, m-learning, and television have direct impact but assessment agent system, e-learning, desktop presentation program, and heating ventilating & air conditioning have no impact. This research contributes towards raising the educational standards of the students so that can prepare themselves for the upcoming life. Moreover, the

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findings depict that for every institute there is a need to pay ample attention to technology which is fruitful for their career. It is also important for vision of learning, professional development, structural changes in the institutes, technical support, and evaluation etc.

INTRODUCTION

In every society, the value of education has been recognized and it is considered as a compulsory phenomenon for the children worldwide. The word education is derived from the latin words educare and educere. Educare means 'to raise' 'to bring up' 'to direct'. It is an improvement in the intellectual of the public and private students. Educational process is the fostering of the human personalities and potentials. Aristotle's philosophy defines it as the concept of education that subsumes the societal principles. It does not only mean the knowledge, skills but also ideas, virtues, and practices aimed to do character building. All the students of present time are now born in digital age and they come to the institutes with the high expectations of the services they get. They are no longer the same as were in the past time. In the response to the needs of the students the educational institutes have adopted use of the new technology. The institutes of higher education have adopted the blended approaches of learning (Bello, 2014; Akhtar, Warburton & Xu, 2015).To improve the performance of the students, there are many economic and social issues. Much of the use of technology and subjects to be presented are outside the classrooms. As numerous studies focus on the teaching style and the teachers. However, other studies focus on other factors. (Carnoy, Ngware, & Oketch, 2016)

The latest report by “National Academies” shows that technology has an importance in the lives of the people. In the present time, the students are enriched with the digital technology since their infancy. Technology use brings rich and diverse material for the students so that they can learn things in short span of time and numerous records in the libraries are collected in the form of digital technology. The definition of societal media is “it is the relationship between the networks of people”. With the passage of time the world has changed and transformed. Thanks to the creativity of the social media that our generation can exchange their ideas, information, images, and video at a high rate. As time moves technology turns engrained more in our lives. To understand the role of technology there are aspects that should be understood in first stance like new manner of communication for instance use of computer, desktop presentation program, assessment agent system, heating ventilating and air

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conditioning, e-learning, m-learning, television (Johnson, 2014). The students at higher level are concerned more with the academic achievements. Their curiosity and interest in their work is to experience the latest knowledge. Hence, "The aim of the study is to examine the factors of technology that are affecting the students' academic achievements".

RESEARCH QUESTIONS

i. How computer skills and desktop presentation program (DPP) affect the achievements of the students?
ii. What is the role of heating ventilating and air conditioning (HVAC) and assessment agent system (AAS) that lead to enhance student achievement?
iii. What is the effect of E-learning and learning from television on the performance of the student?
iv. What is the impact of m-learning on the academic achievements of the students?

RESEARCH OBJECTIVES

i. To elucidate the computer skills, and desktop presentation program (DPP) regarding the students' achievement
ii. To explore the relationship of heating ventilating and air conditioning (HVAC) and assessment agent system (AAS) among the students.
iii. To evaluate the relationship of E-learning and learning from television relevance to the students' performance.
iv. To identify the impact of m-learning on the students' academic achievements.

LITERATURE REVIEW

The literature review is conducted on the factors that lead to academic achievements of the students. Several educators, policy creators and academics have talked about the components that examine the students' academic achievements. Many researchers in various parts of the globe have examined this content in their own manners according to their own social conditions. In response to the aggregate calls for betterment, various studies and reports have examined a common set of fundamental components. There are "seven principles'' for effective professional development experiences. They propose that the experiences must: Be a well-defined classroom teaching, providing opportunities to create knowledge, Use the strategies, build an acquisition community, Support teachers, provide linkup, provide opportunities and guarantee positive impact on student learning. Experience of learning has a permanent influence and it has an intervention in the education field. In this research, the analysis fosters that learning environment is important: to solve the problems that lead to the academic achievements. (Carrillo, Onofa, & Ponce, 2010; Rodriguez, 2010; Keung, 2014)

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Academic Achievement of the Students

The technological advancement helps to enhance the learning environment which can provide a support to the teachers to see how each student is learning through their support as a mediator. This literature is built to highlights the contextual variables that utilize technological advancement in the classrooms. According to the new tech network the students are strongly agreed with the statement that my experience is positive with the technological advancement. And only 7 percent of the students said that they disagree with the statement. (Harley, Carter, Papaionnou, Bouchet, Landis, Azevedo, & Karabachian, 2016; Hegedus, Tapper, & Dalton, 2014; Loughlin, 2017)

Benefits of Computer

Students nowadays use laptops for various purposes such as academic and non-academics; it includes amusement, sending emails, search articles, and many more. Constituent such as a student's former computer experience, accessible campus infrastructure, technical issues, and aid of technology can impact the students to make use of laptops (Annan-Coultas, 2012; Roy, & Chakraborty, 2015; Kay, & Lauricella, 2016). The educators are likely to combine the technology instructions in the studies so that a good fit can be achieved. Numerous literatures promise the technology outcome such as the performance, self- confidence, and achievement of the students. The title 'computer meets classroom and classroom wins' is the Cuban's article written in 1993 on the educational reform and the information technology. It shows the powerful perceptions about the enhancement of the technology reforms. (Conway, & Amberson, 2011)

Usage of Desktop Presentation Programs (DPP)

The writers have shed light towards Interactive White Board Technology IWBT use and also reported that educators agreed on the optimistic impact of interactive materials in the class. To elevate the statement further, technology alone cannot alter the classroom learning but it needs the intervention by the teacher as a mediator. Moreover, whiteboards use a synchronous transmitting mode. Technology creates a classroom with motivated students. Classroom acquisition is also deepening by the use of visuals. Furthermore, technology caters the instructors to meet the needs of the students with different learning styles. (Qirim, 2014)

Temperature and Ventilation Concerns (HVAC)

HVAC means "heating ventilating and air conditioning systems". There are many factors that affect the student on daily basis. Teachers wanted to see their students to succeed in life. But unfortunately, there are numerous factors showing that a teacher has zero control. For instance: lighting, seating arrangement, and the decorous use of classroom space (lumpkin, Goodwin Jr, Hope, & Lutfi, 2014). High performance building (HPB) consists of lighting and control system by the administration. The

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ventilation and air conditioning are very important for the students. These researchers were in a variety of field includes public health, education planning, education policy, and others architectures. Ample evidences show that classroom have an impact on the students' ability to hear (Baker, & Bernstein, 2012).

A school assessment score on the level of API from A to F grades. They assessed these measures such as security, management, restroom facilities, air quality, and maintenance (Loughlin, 2017). A research has been related to the lighting that has an impact on the health, circadian rhythms, vitamin D production, mood swings, depression level, and many others. Moreover, when the quality of air is not proper the education building is suffering from syndromes such as respiratory diseases, cold, etc.(Jaramillo, 2013; Haverinen-Shaughnessy, & Shaughnessy, 2015)

Effectiveness of Assessment Agent System (AAS)

The advantages in the utilization of concept map are for evaluation of student learning. It expresses the needs of the students, assists them students, provide feedback. In America, the evaluation of the performance is timely in the institutes for the teachers. The teachers are evaluated on the skills, management, and knowledge. Evaluation process is based on four levels. That are distinguish, proficiency, basic, and unsatisfactory. Then the evaluators send the feedback to them and provide the details in their observations. Concept mapping is a tool that is very powerful for the students as it represents their knowledge structure. The researchers distribute it in three components: learners to show knowledge, response for task, evaluate the students. Researcher has provided 10 components that are important: Make students responsible, teachers provide clear goal, valuable outcomes, identify current knowledge, develop a plan, Self-monitoring, use of grading criteria, frequent assessments, feedback, awareness. (Liu, 2013).

UTILIZATION OF E-LEARNING

The delivery of the content with the help of electronic media enhances learning process. Among the benefits of e-learning the best is the expansion of education with flexible time and place. Continuity in the innovation process leads to the replacement of the old techniques with the electronic progress. For example, the e-boards have replaced blackboard and chalk, traditional books. The use of technology has transformed the traditional course delivery into modern techniques. In South African universities e-learning is becoming famous. Much of the literatures have been proved evident that e-learning has a positive impact on the student learning (Bharuthram, & Kies, 2012; Macleod, & Kefallonitis, 2017; Malhi, Bharti, & Sidhu, 2015). It has also attracted researcher which has fueled the large number of books, journals, articles and other web resources. These materials have provided good guidance for the students to experience e-learning. Additionally, online modules can permit students to cause the learning activity by determining these questions what, when,

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where, and how (Prunuske, Henn, Brearley, & Prunuske, 2015). Moreover, discussion boards, blogs, group tasks can also facilitate students' engagement in the study. Google scholar is also very important for searching the reputable journals, articles and books (Revere, & Kovach, 2011)

Television a Multimedia Learning Technology

Researchers are debating on the risks and the benefits related to media. Watching educational programs in moderation can improve their knowledge, reading & writing skills (Malhi, Bharti, & Sidhu, 2015). Television has come up as an idea is developed as "technology as media". It has strong evidence that technology extends and broadened the experience of students beyond the classroom. Moreover, media that contains emotional contents is related more to the physiological stress such as blood pressure, heart beating high, cortisol etc. Weekly Up to 10 hours raise the level of achievement slightly but beyond the 10 hours in a week, the achievement falls with additional viewing which is up to 35 or 40 hours weekly. It decreases the level of tension and pressure. A short story transmission on the television can be the source to raise the motivation level among the young generation. It can be worth mentioning to tell about these few scenes that are lessons for the young generation. Speech by a father to his son to handle the rejection and failure in the life. To follow your dream should be your priority. The writer has the motivational instants to write. Teaching to civilize the society. Football team motivation and team spirit. (Aladé, & Nathanson, 2016; Khan, 2012; Mares, Sivakumar, & Stephenson, 2015; Mares, & Sivakumar, 2014; Moble, Kleimann, Rehbein, & Pfeiffer, 2010; Mohamad, Ismail, Wahab, & Mamat, 2016; Roy, & Chakraborty, 2015; Szu, Osborne, & Patterson, 2016)

Distance learning through mobile

There has been a drastic increase in the use of the mobile phones in the few years. The goodness of mobile technology for learning is an advantageous aspect to include it anytime. The use of mobile technologies has many benefits: to do search, to find knowledge anywhere (Sha, Looi, Chen, & Zhang, 2011; Fabian, Topping, & Barron, 2015). Several studies have shown that if the learning through technology is conducted properly then there will be a boost in the learning attitude. For instance, there is no restriction of the space, time for the students (Furio, Juan, Seguit, & Vivo, 2014; Chen, Liu, & Hwang, 2015). As a new generation student have grown up using technologies of computer, mobile devices. So, the game-based learning through mobile can be useful as it leads to improve learning. Mobile technology has low cost and easily accessible in urban as well as rural areas because it requires low amount of electricity and infrastructure. For many years in Mexico the focus is on the expansion of education sector so emphasize shifts towards mobile technology. Moreover, it is considered as the "pocket of potentials related to the

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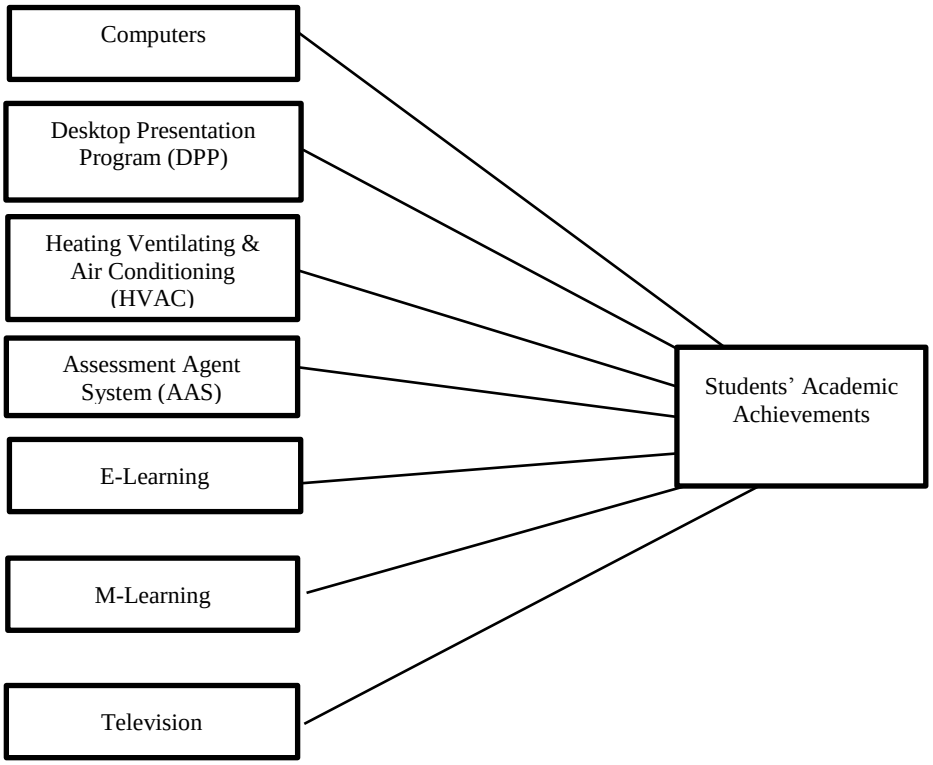
education enhancement" (Furio, Juan, Seguit, & Vivo, 2014). In this paper, a self-developed framework is made with the help of the literature review on the education studies. Here seven independent variables of ICT are found associating with the academic achievements of the students. As a matter of fact, literacy rate in Pakistan is low so there is a need to focus on these advancements because the present age is the age of technology and machines so much emphasizes is on ICT

Figures 1
Conceptual Framework



(Source: Self-Developed)

RESEARCH HYPOTHESES

H1: There is an association between Computer & students' academic achievement.
H2: There is an association between Desktop Presentation Program (DPP) & students' academic achievement.
H3: There is an association between Heating Ventilating and Air conditioning (HVAC) & students' academic achievement.

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H4: There is an association between Assessment Agent System (AAS) & students' academic achievement.
H5: There is an association between E-Learning & students' academic achievement.
H6: There is an association between Learning by Television watching & students' academic achievement.
H7: There is an association between M-Learning & students' academic achievement.
H8: There is an impact of Computer on students' academic achievement.
H9: There is an impact of M-learning on students' academic achievement.
H10: There is an impact of watching Learning by Television on students' academic achievement.
H11: There is an impact of Assessment Agent System (AAS) on students' academic achievement.
H12: There is an impact of E-learning on students' academic achievement.
H13: There is an impact of Desktop Presentation Program (DPP) on students' academic achievement.
H14: There is an impact of Heating Ventilation and Air conditioning (HVAC) on students 'academic achievements

RESEARCH DESIGN AND METHOD

Revolutionary philosophy of positivism is criticized by Post-positivism. Post-positivism got recognition owing to the aspect of falsification of hypothesis. The dichotomous association between the knowledge and the researcher is impossible because of the other factor that is the influence of either knowledge or researcher. These influences are many in nature like culture, values, human knowledge, religion, and beliefs that affect the relationship between the knowledge and the researcher. Post-positivists supported the fact that knowledge can be falsified and also the theory can be refuted under certain circumstances. Here the knowledge is considered as objective aspect rather than subjective which can be falsified or accepted. According to the methodological strategy, this research comes under discussion of post-positivism paradigm. The philosophy of Epistemology is taken. Moreover, it is based on Quantitative Approach. There are many layers in the research design. Philosophical stance is explained in the first layer that is the Post-Positivist Paradigm. The second layer is about approach which is Deductive Approach because this approach has been used previously. It aimed to test the relationship of ICT in learning environment. In this case, hypotheses were statistically testified to check the relation of ICT in the learning environment. Lei (2010) also supported the empirical analysis to accept or falsify the relationship among the variables. Hence, deductive approach was utilized to meet the objectives of the research. Through the survey questionnaire the Quantitative data were collected and then analyzed. Responses of the respondents were collected with the help of convenience sampling. The last layer is about the time horizon to collect the data of this research which was cross sectional in nature.

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RESULTS FINDINGS AND ANALYSIS

Extensive study has been used to stream the dimensions and constructs of ICT on the academic achievements of the students. In the beginning pilot testing has been completed to check the regression and correlation of the items present in the questionnaire, then deducing weak items from the constructs. Modifications has been made for those objects that mystify the respondents. Those objects have been included that highly represent the dimensions and used inter item correlation. In the questionnaire, the designs have been used on five-point Likert Scale. It includes strongly disagree, disagree, neutral, agree, strongly disagree. The wordings in the questionnaire has been easy to avoid ambiguity for the respondents. In pilot testing, 40 respondents have been used to check their understanding of the questionnaire. After coding the data on SPSS, the second step has been to do the descriptive statistics has been done to find out the frequencies. Then Cronbach's alpha has been used to check the reliability of data. To find the significant impact and relationship among variables regression and correlation ware used. The population consists of those students who are enrolled in different programs in SZABIST Karachi campus. These are at different levels starting from bachelors to PhD level. The target population is the students studying at Karachi campus. These students are approximately 5000 in number. The data is collected on the basis of convenience sampling. The sample size in the research study is 357 students according to the size of population at 95% level of confidence with 5% minus plus error (Saunders, 2006, p.174).

Reliability

Reliability is well-defined as the consistency of the achieved results while repeatedly calculating the items of research). Later on, Hair et al, (2007) proposes various other values that are acceptable values for measuring the reliability of the scale through Cronbach's alpha. According to him there are different values. firstly value <0.6 is considered as poor, secondly, the range of values from 0.60 to 0.70 is counted as moderate, however the range of value from 0.70 to 0.80 is considered as good while the value that ranges from 0.8 to 0.9 is considered as very good and in the end the value above 0.90 is excellent. The table 1 (in Appendix) is showing the value of Cronbach alpha which is 0.885 depicting very good reliability of the scales.

Table 1

Cronbach Alpha	Number of Items
0.885	42

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Correlation Analysis

Data analysis of Correlation in Table 2 (in appendix) is used to check the association and to know whether they are rejected or failed to reject (accept). Computer, AAS, e-learning, m-learning, television is .000, therefore they reject the null hypotheses and it conclude that except these two DPP and HVAC are highly correlated. Whereas the value of significance of these two variables show that there is a no correlation of them with the academic achievements of the students.

Table 2
Correlation Analysis

		COMPUTER	DPP	HVAC	AAS	E-LEARN	TV	M-LEARN
Students' Academic Achievement 1	Pearson Correlation	.386**	.091	-.026	.285**	.371**	.310**	.573**
	Sig. (2 tailed)	.000	.086	.631	.000	.000	.000	.000
	N	354	356	355	356	356	356	356

*. Correlation is significant at the 0.05 level (2-tailed).

Regression Analysis

In this study, multiple regression is used. The result is depicted in Table 3 (in appendix) that value of adjusted R Square is 0.416, it means that independent variables are calculating 41.6 % of the dependent variable in other words there is 41.6 percent impact of the independent variables on the dependent variable which academic achievements are explained by independent variables of ICT. Further, the results depict that computer, m-learning, television are 0.000 therefore it shows evidence to reject the null hypotheses which conclude that there is a positive relationship of them with the academic achievements of the students. The T values of these three variables are more than 2 which show their significance. Whereas the other four independent variables that are assessment agent system, e-learning, desktop presentation program, and heating ventilating air conditioning are insignificant with their significant value more than .05 and their T values less than 2. Hence, this is sufficient to reject alternative hypotheses and to accept their null hypotheses showing no relationship with the dependent variable that is academic performance in the study.

Table 3
Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.654[a]	.428	.416	.36548

a. Predictors: (Constant), HVAC, TV, COMPUTER, AAS, M-LEARNING, DPP, E-LEARNING

ANOVAb

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	34.466	7	4.924	36.860	.000[a]
	Residual	46.085	345	.134		
	Total	80.550	352			

a. Predictors: (Constant), HVAC, TV, COMP, AAS, M-LEARNING, DPP, E-LEARNING

Coefficients[a]

Model	Unstandardized Coefficienrs		Standardized Coefficienrs	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	.174	.127		1.378	.169
COMPUTER	.221	.046	.229	4.824	.000
M-LEARNING	.477	.054	.435	8.904	.000
TELEVISION	.127	.035	.159	3.640	.000
ASSESSMENT AGENT SYSTEM	.028	.040	.038	.709	.479
E-LEARNING	.064	.040	.083	1.577	.116
DESKTOP PRESENTATION PROGRAM	-.023	.036	-.031	-.629	.530
HEATING VENTILATING & AIR CONDITIONING	-.021	.036	-.029	-.569	.570

DISCUSSION

The purpose of this paper is to examine an indelible link of learning and technology by finding the impact and association of ICT on the academic achievements of the students (Afzal, & Fardous, 2016; Baker, & Bernstein, 2012; de Sousa, Richter, & Nel, 2017; Haverinen-Shaughnessy, & Shaughnessy, 2015; Jaramillo, 2013; Johnson, 2014; Qirim, 2014). Results of this study depict that computer, television, m-learning have both the positively strong association as well as the direct impact on the academic achievements of the students. Furthermore, the beta values show the significance value as p-value is significant at .000. The unstandardized coefficients beta value of computer is .221 which is significant at .000, it

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shows that if computer use can be increased by 1% then the academic achievement will increase by 22.1%, secondly when m-learning and television is increased by 1% then academic achievement will increase by 47.7% and 12.7% respectively. On the other hand, the results of regression for assessment agent system, e-learning, desktop presentation program, heating ventilating & air conditioning have no impact on the academic achievement of the students. Hence these hypotheses H1, H4, H5, H6, H7, H8, H9, H10 have been failed to reject (means accepted) and H2, H3, H11, H12, H13, H14 have been rejected. In a nutshell, on the basis of the results of the research study and literature review of different scholars, the objectives and purpose of the study have been attained successfully. As questionnaire were distributed among 357 students who were taken from the population of 5000 SZABIST random students. Moreover, ICT has a strong impact and association with the academic achievements of the students. Findings show that the indelible link of learning and technology have association and impact in case of variables as mentioned previously.

CONCLUSION

In this paper, a self-developed framework is used which is completed with the help of the literature review on the education studies. Most of the review of the literature is done on ICT on the large scale but here in this study the focus is on the specific dimensions of technology. The findings give a conclusion that for every institute there is a need to use the technology. The technology-based education programs are very important for the growth of the students. It will not be realized unless ample attention paid to technology use. It is important for vision of learning, professional development, structural changes in the institutes, technical support, evaluation etc. Moreover, different Authors have given their views about the role, significance, prominence of the use of the technology in different aspects. When they have conducted research in different societies and surroundings they found that technology advancement helps to enhance the learning environment for the students.

RECOMMENDATIONS

Useful study has been done on this topic but there is always a room an improvement. Keeping in view the value of research topic, almost every effort has been made so that the accurate results can be achieved. The subsequent recommendations are still required to raise the future advantages for the students. These are given as follows:

- The institutional administration should raise the assess to computers for better results and also provide them guidance.
- Secondly, parents are requested to guide their children to watch informative channels to enhance their learning.
- Portable m-learning needs to be encouraged among the students.

Keeping in view the advantages of these variables the institutes are required to provide a complete package in the long run. It must be incorporated in the daily learning process.

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