

Relation Between Computer Technology Usage and Academic Performance at Higher Education Institution

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Abstract

Computer technology expansion and upgradation is important in India today. Numerous opportunities are presented to educators. Technological advances play a very important role in everyone's life and in every facet of life. Higher education is adopting these technologies to convert its major work. The computer may prove to be an asset for higher education institutions. Computer technology has transformed the higher education system. Computer technology has made teaching and learning easy and more enjoyable. Higher education facilitating its students to collect certificate / degree through online procedure. Online video and study material are improving students' information literacy. Students are adopting video lectures and learning materials with the use of Internet. Technology literacy is making learning very efficient regardless of distance. Flexible and interactive teaching and learning amongst the students of different cultures enhancing their skills.

Key Words: Computer Technology, Usages, Higher Education, Achievement, Impact of Technology, Teaching & Learning

1. Introduction

Willingness to use computer technology is increasing amongst the students of higher education (Bragdon and Dowler, 2016; Rideout et al., 2010). Higher education institutions are actively participating in implementing computer technology. Higher education teaching and learning process is changed due to adoption of computer technology in education (McCabe and Meuter, 2011). The focus of this study is to investigate relation of computer technology on academic performance. This study has shed light on the way technology is being used in higher education in India. Technological developments lead to changes in problem solving skills of relating one set of information to another in a different form by using experience, relating new problems to ones we have previously solved (Anderson and Weert, 2002).

Improvement in students' existing skills and knowledge refers to academic performance of the student (Basri et al., 2018). Computer technology may be an asset to analyse and evaluate various perspectives since it has proven to be a valuable innovative tool in higher education. Computer technology making correlation between various types of information available, it revolutionized the higher education system. New technology is time saving and helping in removing redundancy. Immediate feedback and interactive sessions are improving students' performance.

Educational processes now shifting towards computerization (Brown, 2012; Dermentzi et al., 2016; Hung & Yuen, 2010; Lim et al., 2015; Tahani et al., 2020). Youth have shown higher rates of innovation usage than their older counterparts (Arts et al., 2011; Bartels & Reinders, 2011; Im et al., 2003; Tahani et al., 2020). In the past students have become very comfortable in learning through transmissive modes. The growing use of computer technology in higher education has changed the teaching and learning process.

Review of Literature

Students use computers as information sources and cognitive tools. for real-time communication; screens for presentations and demonstrations, there are chalkboards, whiteboards, and digital pens; polls and quizzes for assessing comprehension or generating feedback; and breakout rooms for small group work. (Bower, 2011; Hudson et al., 2012; Martin et al., 2012; McBrien, Jones, & Cheng, 2009; Schindler et al., 2017). 911 universities and 51925 colleges listed by UGC are enrolling 373.99 lakh students in the year 2018-19 (UGC Report, 2018-19). Student enrolment is increasing by 2.07% every year. It may be seen that the ratio of male is higher than the. Cloud computing has a significant and positive effect on students' academic performance (Raza et al. 2020). Computer

technologies permitting the user to be more energetic in their creation of mental images (Lowerison et. al., 2004). Computer technology inspires interface and assistance among students, teachers regardless of distance. It makes classroom more collaborating and exciting (Raja and Naga subramani, 2018).

Masood et al. (2020) offer significant implications for the strategizing of managers and researchers to reduce psychological problems. The increasing use of Internet and computer technologies as state-of-the-art and appreciated tool of day-to-day life and development in recent years have forced future expansions and computer technology will grow more (Oliver, 2002). Today's college students assume that technology will be vital in their higher education (Bragdon & Dowler, 2016). Computer applications have the potential to offer value damenities to college level education. Computer can do some things better than other media. It has to be understood that visual explanation of concepts makes learning fun and enjoyable for students. They're able to participate more in the classroom and even teachers get a chance to make their classes more interactive and interesting (Sharma & Kumar 2021).

Research Questions :

1. Is there a significant relationship between computer technology usage in higher education and students' academic performance?
2. Is higher education adopting computer technology for students' academic performance?
3. Is computer technology usage impacting the academic performance of students?

Research Methodology:

The present study was designed to understand how computer technology usage enhances students' academic performance in higher education institutions.

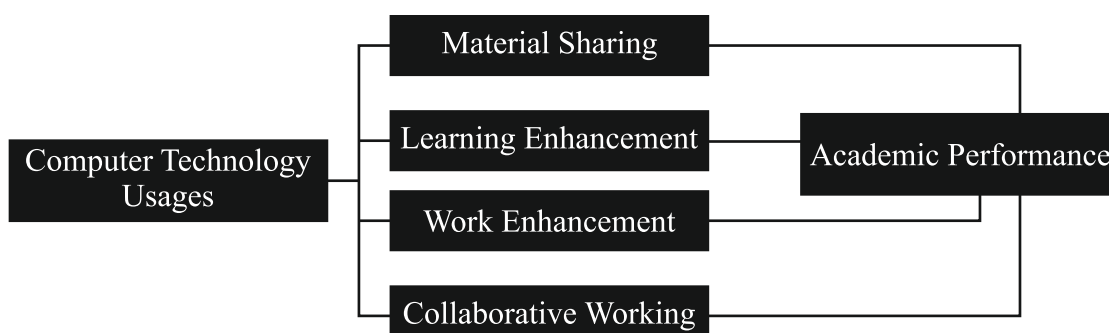
Sample: The initial sample for this study consisted of 200 students. 40 surveys are rejected due to response error. The sample of 160 students was finalized. Government Universities, Private Universities and Self-financed institutions have been chosen for the sample. 81 male and 79 females. 32 students having less than 2 years of technology usages experience, 76 students having less than 5 years of technology experience and 52 students have more than 5 years of technology experience. 97 students were using computer technology daily, 56 students were using technology some times and 7 students are utilizing computer technology only for their administrative work.

Questionnaire Construction: The survey was designed to examine what, if any, impact the usage of computer technology has on students' academic performance. Factors related to computer technology helped to create an initial pool of items. The final survey consisted of 37 items for the student survey.

Results and Discussion

Computer technology provides a strong support for performance-based teaching and learning that make usage of the affordances of these technologies. With the widespread availability and acceptability of computer technology in higher education institutions many hurdles and restrictions of past have been removed. New and updated computer technology drives the new form of learning amongst the students of higher education.

There has emerged, a need for computer technology literacy in higher education institutions in order to encourage graduates to solve problems. Results shows that future developments and technology will grow even more. Computer technology has the capacity to promote and encourage more student cantered education.



Scale Reliabilities Computer Technology Usage

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.874	.875	9

Work Enhancement		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.865	.867	7

Collaborative Working		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.762	.764	6

Learning Enhancement		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.849	.850	7

Performance		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.787	.787	8

Hypothesis 1: There is no significant correlation between performance and adoption of computer technology

Correlations						
		Comp_usage_Readiness	Work_enhancement	Collaborative Working	Learning_enhancement	Performance
COMP_USAGE_READINESS	Pearson Correlation	1	.723**	.522**	.724**	.708**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000
WORK_ENHANCEMENT	Pearson Correlation	.723**	1	.501**	.685**	.678**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000

COLLABORATIVE WORKING	Pearson Correlation	.522**	.501**	1	.576**	.635**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000
LEARNING ENHANCEMENT	Pearson Correlation	.724**	.685**	.576**	1	.694**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000
PERFORMANCE	Pearson Correlation	.708**	.678**	.635**	.694**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
**. Correlation is significant at the 0.01 level (2-tailed).						

There is significant correlation between performance and usage of computer technology. For presentations and demonstrations, there are chalkboards, whiteboards, and digital pens; polls and quizzes are used to assess comprehension or elicit feedback; and breakout rooms are used for small group work. Hypothesis 2: There is no significant difference between expected learning outcome and academic performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1.	.708a	0.501	0.498	0.42212	0.501	158.474	1	158	0.000
2.	.773b	0.597	0.592	0.38036	0.096	37.599	1	157	0.000
3.	.793c	0.630	0.622	0.36593	0.032	13.621	1	156	0.000
4.	.803d	0.644	0.635	0.35974	0.015	6.422	1	155	0.012

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1.	Regression	28.237	1	28.237	158.474	.000b
	Residual	28.153	158	0.178		
	Total	56.390	159			
2.	Regression	33.677	2	16.838	116.390	.000 ^c
	Residual	22.713	157	0.145		
	Total	56.390	159			

3.	Regression	35.501	3	11.834	88.371	.000d
	Residual	20.890	156	0.134		
	Total	56.390	159			
4.	Regression	36.332	4	9.083	70.187	.000e
	Residual	20.059	155	0.129		
	Total	56.390	159			

Learning enhancement predicts performance. Computer technology helps in acquiring knowledge and information without any difficulty. Key functionalities of computer technology lower the complexity and more student will intend to adopt services of computer technology.

Conclusion

The goal of this study is to expand our knowledge and information about adoption of computer technology in higher education. This paper explored the role of computer technology in 21st century higher education. Findings of the study show that computer technology has a significant and positive impact on students' academic performance. Computer technology provides access to students to retrieve their study material anywhere and at anytime. Universities should encourage students to adopt computer technology as it is very fast and less expensive.

Researcher argued that the impact of computer technology on students' higher education learning will grow considerably in years to come. Computer technology will change the current practices and working of higher education. Academics should employ new education policy that focus mainly on interactive system for collaborative working. This will help students to access their up-to-date material easily. Students can maintain large database of their material, PPT and work.

The study has several directions for future research. Sample size of this study is limited to smaller sample, therefore future studies should collect data from larger sample. Future studies should add mediators and moderators to verify their effect on computer technology adoption.

Implications of the Study

The Study implies that computer technology usage is a must for higher education institutions to grow and make a mark in global economy. Resource availability and its proper implications are important factors to increase computer technology usage in higher education. Study result implies that availability of computer technology could increase the performance of the students.

Customization of teaching and learning material is easily and appropriately sequenced from simple to complex, known to unknown by usage of computer technology. This teaching and learning have a feedback mechanism, feedback on the basis of learner's pace can be provided by the computer technology. With the involvement of Computer technology in the evolution process for teaching and learning students are more dedicated and encouraged to complete the teaching and learning on time.

References

- Anderson Jonathan and WeertTom van(2002). Information and communication technology in education. A curriculum for schools and programme of teacher development.
- Arts, J. W. C., Frambach, R. T., &Bijmolt, T. H. A. (2011). Generalizations on consumer innovation adoption: A metaanalysis on drivers of intention and behavior. *International Journal of Research in Marketing*, 28(2), 134–144. <https://doi.org/10.1016/j.ijresmar.2010.11.002>.

- Bartels, J., & Reinders, M. J. (2011). Consumer innovativeness and its correlates: A propositional inventory for future research. *Journal of Business Research*, 64(6), 601–609. <https://doi.org/10.1016/j.jbusres.2010.05.002>.
- Bower, M. (2011). Redesigning a web-conferencing environment to scaffold computing students' creative design processes. *Journal of Educational Technology & Society*, 14(1), 27–42.
- Bragdon, Rodney, A., & Dowler, Kristina (2016). College Student Technology Use and Academic Performance. *International Journal of Humanities and Social Science*. 6 (1), 1-11.
- Brown, S. A. (2012). Seeing Web 2.0 in context: A study of academic perceptions. *Internet and Higher Education*, 15(1), 50–57. doi.org/10.1016/j.iheduc.2011.04.003.
- Dermentzi, E., Papagiannidis, S., Osorio Toro, C., & Yannopoulou, N. (2016). Academic engagement: Differences between intention to adopt social networking sites and other online technologies. *Computers in Human Behavior*, 61, 321–332. <https://doi.org/10.1016/j.chb.2016.03.019>
- Hudson, T. M., Knight, V., & Collins, B. C. (2012). Perceived effectiveness of web conferencing software in the digital environment to deliver a graduate course in applied behavior analysis. *Rural Special Education Quarterly*, 31(2), 27–39.
- Hung, H. T., & Yuen, S. C. Y. (2010). Educational use of social networking technology in higher education. *Teaching in Higher Education*, 15(6), 703–714. doi.org/10.1080/13562517.2010.507307.
- Lim, N., Grönlund, Å., & Andersson, A. (2015). Cloud computing: The beliefs and perceptions of Swedish school principals. *Computers and Education*, 84, 90–100. doi.org/10.1016/j.compedu.2015.01.009.
- Lowerison Gretchen, SclaterJennifer, Schmid Richard F., Abrami Philip C. (2004). Student perceived effectiveness of computer technology use in post-secondary classrooms. [doi:10.1016/j.compedu.2004.10.014](https://doi.org/10.1016/j.compedu.2004.10.014)
- Martin, F., Parker, M. A., & Deale, D. F. (2012). Examining interactivity in synchronous virtual classrooms. *International Review of Research in Open and Distance Learning*, 13(3), 227–261.
- Masood A., Luqman A., Feng Y., Ali A. Adverse Consequences of excessive Social Networking Site Use on Academic Performance: Explaining Underlying Mechanism from Stress Perspective. *Computers in Human Behaviour* Vol 113 DOI 10.1016/j.chb.2020.106476
- McCabe, D. B., & Meuter, M. L. (2011). A student view of technology in the classroom: Does it enhance the seven principles of good practice in undergraduate education? *Journal of Marketing Education*, 33(2), 149-159.
- Oliver, Ron (2002). The role of ICT in higher education for the 21st century: ICT as a change agent for education. <https://www.researchgate.net/publication/228920282>.
- Rideout, V. J., Foehr, U. G., & Roberts, D. F. (2010). Generation M2: Media in the lives of 8- to 18-year-olds (Publication Number 8010).
- Rodney A. Bragdon and Kristina Dowler (2016). College Student Technology Use and Academic Performance. *International Journal of Humanities and Social Science*. Vol. 6, No. 1; January 2016.
- Schindler Laura A., Burkholder Gary J., Morad Osama A. and Marsh Craig (2017). Computer-based technology and student engagement: a critical review of the literature. Schindler et al. *International Journal of Educational Technology in Higher Education* (2017) 14:25 DOI 10.1186/s41239-017-00630
- Sharma D., Kumar S. (2021). Influence of Past Academic Performance and New Media Usage on Co-Scholastic Area Related Learning Outcomes For Senior Secondary School Students in North India. *Journal of Content Community & Communication* Vol 13 DOI: 10.31620/JCCC.06.21/27

Syed Ali Raza, Komal Akaram Khan, S. M. Tariq Rafi (2020). Factors Affecting the Academic Performance through Cloud Computing Adoption. Journal of Education & Social Sciences Vol 8(2) 1-15 DOI: 10.20547/jess0822008201

Tahani Z. Aldahdouh, Petri Nokelainen, and Vesa Korhonen (2020). Technology and Social Media Usage in Higher Education: The Influence of Individual Innovativeness. SAGE Open January-March 2020: 1– 20. DOI: 10.1177/2158244019899441.

UGC Report 2018-19. Downloaded from https://www.ugc.ac.in/pdfnews/3060779_UGC-Annual-Report--English-2018-19.pdf

Wael Sh. Basri, Jehan A. Alandejani, and Feras M. Almadani (2018). ICT Adoption Impact on Students' Academic Performance: Evidence from Saudi Universities. Hindawi Education Research International Volume 2018, Article ID 1240197, 9 pages <https://doi.org/10.1155/2018/1240197>.

APPENDIX 1

Correlations

		Performance	Comp_usage_readiness	Work_enhancement	Collaborative Working	Learning_enhancement
Pearson Correlation	Performance	1.000	.708	.678	.635	.694
	Comp_usage_readiness	.708	1.000	.723	.522	.724
	Work_enhancement	.678	.723	1.000	.501	.685
	Collaborative Working	.635	.522	.501	1.000	.576
	Learning_enhancement	.694	.724	.685	.576	1.000
Sig. (1-tailed)	Performance	.	.000	.000	.000	.000
	Comp_usage_readiness	.000	.	.000	.000	.000
	Work_enhancement	.000	.000	.	.000	.000
	Collaborative Working	.000	.000	.000	.	.000
	Learning_enhancement	.000	.000	.000	.000	.
N	Performance	160	160	160	160	160
	Comp_usage_readiness	160	160	160	160	160
	Work_enhancement	160	160	160	160	160
	Collaborative Working	160	160	160	160	160
	Learning_enhancement	160	160	160	160	160

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36.332	4	9.083	70.187	.000b
	Residual	20.059	155	.129		
	Total	56.390	159			

Coefficients^a

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero order	Partia 1	Part
1	Performance	.668	.203		3.293	.001			
	Comp_usage_readiness	.238	.069	.270	3.442	.001	.708	.266	.165
	Work_enhancement	.196	.069	.211	2.848	.005	.678	.223	.136
	Collaborative Working	.224	.049	.275	4.591	.000	.635	.346	.220
	Learning_enhancement	.167	.066	.195	2.534	.012	.694	.199	.121

a. Dependent Variable: PERFORMANCE

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.4117	4.7918	3.9672	.47802	160
Residual	-1.01205	.74912	.00000	.35518	160
Std. Predicted Value	-3.254	1.725	.000	1.000	160
Std. Residual	-2.813	2.082+	.000	.987	160

a. Dependent Variable: PERFORMANCE

