Annals of Human and Social Sciences
www.ahss.org.pk

Examining the Relationship between Students' Utilization of Technology and Self-Directed Learning: A Research in Pakistan

Dr. Tariq Hussain*[1] Shumaela Tabbasum[2]   Dr. Aroona Hashmi[3]

1. Assistant Professor, IER, University of the Punjab, Lahore, Punjab, Pakistan
2. M. Phil Scholar, IER, University of the Punjab, Lahore, Punjab, Pakistan
3. Assistant Professor, IER, University of the Punjab, Lahore, Punjab, Pakistan

| ***Corresponding Author** | tariq.ier@pu.edu.pk |

ABSTRACT

The aim of this research is to investigate the correlation between students' use of technology and self-directed learning. The study intends to explore whether there are any variations in the level of self-directed learning between students in public and private sector universities. The research employed a correlation design using a quantitative approach. The study population comprised students enrolled in social science BS (Hons), Master, and M. Phil programs at public and private universities in Lahore. The sample was selected using a multistage sampling technique, consisting of 150 male and 150 female students from three public and three private universities. Data was collected using adapted scales, including the MTUAS (media and technology usage and attitude scale) to measure students' use of technology and the SRSSDL (self-rating scale of self-directed learning) to measure the level of self-directed learning. The collected data was analyzed using descriptive statistics (frequencies, percentages, mean score, and standard deviation) and inferential statistics (independent sample t-test and Pearson correlation). The results showed a moderate positive relationship between students' use of technology and their self-directed learning. Moreover, the study found that the level of self-directed learning was higher among students in both public and private sector universities.

| **Keywords:** | Correlation, Learning, Self-Directed Learning, Utilization of Technology |

Introduction

As technology continues to advance, it seems to exert more control over our lives. Nowadays, technology is widely available and heavily promoted throughout society. Academic technology, which is a type of innovative knowledge used to achieve goals or solve problems, has long been recognized as vital in modern societies. However, in recent times, there has been a phenomenal increase in the use of technology, which has led to its rapid diffusion into the daily lives of students. Students now have access to a variety of technological tools, such as smartphones, tablets, wireless internet, gaming consoles, televisions, videos, mobile devices, and applications, no matter where they are.

Glenn (2000) as cited by Barnes, Marateo, & Ferris (2007, p. 102) emphasizes the importance of developing self-directed learning (SDL) abilities in 21st century students. He argues that the Net Generation requires opportunities for SDL, collaborative environments, diverse feedback methods, and task choices to create personalized and expressive learning experiences. SDL is regarded as a critical skill for students in the 21st century, and its development is emphasized by Glenn.

According to Fahnoe and Mishra (2013), a technology-rich learning environment can provide students with numerous opportunities and abilities to be self-directed in their learning. Such an environment enables students to not only become knowledgeable about

relevant sources of information but also learn how to organize and use information effectively.

In formal educational settings, such as schools and universities, individuals are faced with limited resources such as time and cost, which make it practically impossible to access the vast amount of information available. As a result, students are expected to be proficient in studying in both formal and informal settings. Essentially, individuals are required to possess the ability of lifelong learning without the guidance of a teacher. This entails identifying one's learning objectives, motivating oneself, choosing appropriate learning methods, evaluating one's learning progress, and taking responsibility for one's learning.

Self-directed learning with technology (SDLT) abilities can enable individuals to achieve this. Therefore, this study aims to further elucidate the relationship between students' use of technology and self-directed learning. Based on the findings of the literature, it is assumed that the use of technology is positively correlated with self-directed learning

Literature Review

The integration of technology in educational institutions is one of the most significant topics in education today. Most administrators and government officials are of the opinion that using technology in the educational process can equip students with essential skills necessary to compete and thrive in the 21st century. However, the successful implementation of technology in educational institutions largely depends on how teachers and students adopt and utilize it since technology can improve learning and provide valuable life skills to students. Therefore, for technology to be effectively utilized in educational institutions, teachers and students must endeavor to comprehend its effective use (Waddell, 2015).

Chaudron (2015) conducted a study in several European countries to examine the opinions and perceptions of students regarding technologies such as tablets, smartphones, and computers, as well as parents' attitudes towards technology. Based on the study results, students who are digital citizens are raised in a technology-rich environment and are familiar with technology. Consequently, technology is viewed as a significant aspect of students' lives. It was observed that students can acquire basic technology skills quickly and easily and make innovative use of some types of technology. However, this does not apply to all types of technology.

Self-directed learning (SDL) is a process where learners take charge of their learning, identifying their learning needs and goals, selecting appropriate resources, strategies, and evaluating outcomes (Knowles, 1975). Teachers can assist in guiding students to find goals aligned with their interests and needs (Gibbons, 2002). SDL includes individual learning and learning within a network of peers, experts, or instructors (Merriam & Bierema, 2014).

Shuang, Kris, and Ben (2019) investigated the impact of self-directed learning, technology readiness, and learning motivation on students' social, teaching, and cognitive presence in blended learning (BL) and non-BL environments. Results showed that BL provided better facilitation for students' social involvement, and student technology readiness played a stronger role in impacting teaching presence in BL than non-BL environments.

SDL with technology refers to the use of technology to plan, implement, and evaluate learning (Lee et al., 2014). Technology can enhance SDL through collaboration, convenient access to worldwide information resources, online communities, and cultivating creative abilities (Karakas & Manisaligil, 2012). Technology can also assist learners in diagnosing

learning needs, identifying learning paths, and evaluating learning outcomes (Rashid & Asghar, 2016). Technology-rich environments can provide flexible opportunities for learners to facilitate SDL.

Teo et al. (2010) developed a self-report instrument to assess SDL with technology among young students aged 10-12. They emphasized the importance of further research to investigate the factors that influence SDL with technology, including user demographics and relevant constructs. Technology has a direct impact on self-directed learning by providing easy access to information resources and online expertise. Access to a wide range of information that meets their learning needs and interests is crucial for learners to engage in self-directed learning. This involves activities such as capturing, storing, manipulating, and displaying information, as well as communicating with fellow learners and experts worldwide without formalities and with the press of a button (Candy, 2004).

In a study conducted by Sumuer (2018) to identify factors associated with students' self-directed learning with technology, the results indicated that the use of web tools and self-directed learning were significant factors that directly contributed to students' SDL with technology.

The studies mentioned previously in the literature review provide evidence that there is a relationship between students' use of technology and self-directed learning. However, further investigations are always necessary to substantiate these findings.

Research Hypothesis

Ho1: There is no significant difference in the use of technology between students from public and private sectors.

Ho2: There is no significant difference in the level of self-directed learning between students from public and private sectors.

Ho3: There is no statistically significant relationship between students' use of technology and their level of self-directed learning.

Material and Methods

Research Design

The study employed a quantitative research approach to investigate the relationship between students' use of technology and self-directed learning (SDL). The study utilized a correlation field study design, which is well-suited to assess the strength and direction of the relationship between the independent and dependent variables. The primary goal of this design is to evaluate the association between variables.

Population and Sample

The population of the study included all social sciences students enrolled in universities located in Lahore. According to HEC, there are a total of 27 universities in Lahore, among which 16 are private and 11 are public. The population consisted of students enrolled in BS (Hons), Master's, and M.Phil. programs in social sciences. However, due to limited resources and time, the researcher was unable to gather data from all of them. Therefore, data was collected from only 3 private and 3 public universities to ensure convenience. A multistage sampling technique was used to select the sample of the study. The first stage involved purposively selecting public and private sector universities. In the second stage, the population was divided into two main strata of 3 private sector universities and 3 public sector universities, and stratified random sampling technique was

employed. In the third stage, a convenient sample of 150 male and 150 female students was selected from each stratum, who were enrolled in BS (Hons), Master's, and M.Phil. programs in social sciences.
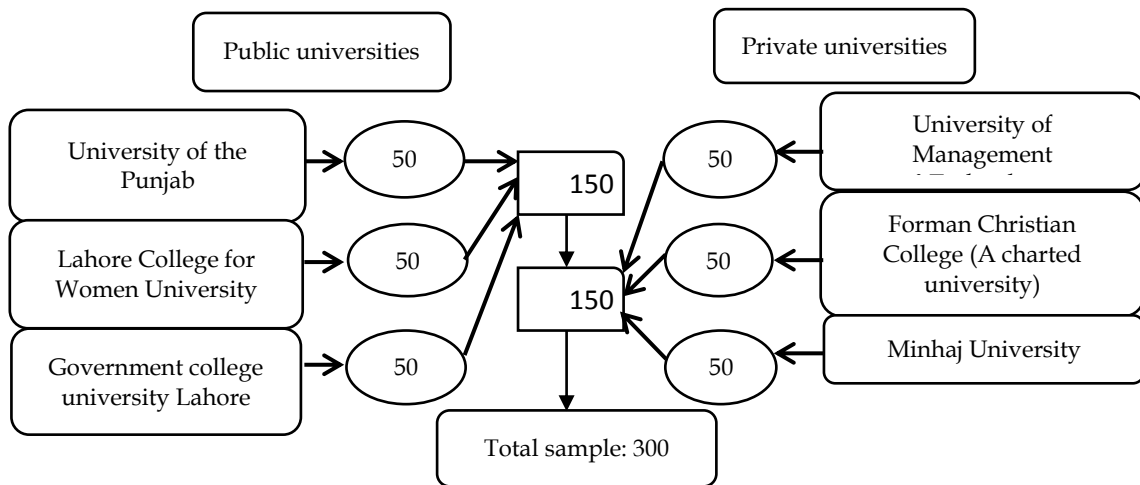

Figure 1

Research Instrumentation

The researcher adapted the Media and Technology Usage and Attitude Scale (MTUAS) and Self-Rating Scale of Self Directed Learning (SRSSDL) to measure the students' use of technology and self-directed learning, respectively. The MTUAS was developed by Dr. Larry D. Rosen, Professor Emeritus at California State University, and the SRSSDL was developed by Dr. Swapna Williamson, Professor at University of West London. Experts validated the instruments, and pilot testing was conducted to ensure reliability. Cronbach Alpha was used to determine the reliability of the instruments. The pilot testing involved a sample of 70 students, and the overall reliability of the research instrument was 0.89. The reliability of the MTUAS and SRSSDL scales were .779 and .837, respectively.

Table 1
Reliability of MTUAS, SRSSDL and CE scale

Variables	Items	Cronbach's alpha
Media and Technology Usage and Attitude Scale (MTUAS)	15	.779
Self-Rating Scale of Self-Directed Learning (SRSSDL)	16	.837

Data Collection

The researcher used an online questionnaire via Google Forms and shared the link in relevant university groups on social media platforms such as Facebook and WhatsApp to collect data from the students.

Data Analysis

The data was analyzed using both descriptive and inferential statistics. Descriptive statistics were used to calculate the mean and standard deviation. Pearson-correlation was used to determine the relationship between students' use of technology, self-directed learning, and classroom engagement. T-tests were used to compare the differences in students' use of technology and self-directed learning between the public and private sectors.

Results and Discussion

Table 2
Summary statistics of Use of Technology

	Types of technology	M	SD
1	Use of Mobile	4.10	0.63
2	Use of Laptops, Tablets	3.61	0.88
3	Use of Internet	3.50	0.59

Overall Mean: 3.73

The table above illustrates that the respondents had the highest mean score (M=4.10, SD=0.63) for the use of mobile technology. The lowest mean score (M=3.61, SD=0.88) was observed for "Use of Laptops," and a mean score of (M=3.50, SD=0.59) was noted for "Use of Internet." Therefore, with an overall mean score of (M=3.73), it can be concluded that the majority of students use technology. Most students use mobile phones for reading emails and searching academic information to complete their educational tasks with a mean score of (M=4.10) as compared to using laptops, tablets, and watching television for updating their knowledge about current affairs with a mean score of (M=3.61). Students do not spend much time on the internet with a mean score of (M=3.50) for informative documentaries and participating in online surveys, and they do not typically share their work online.

Table 3
Summary statistics of overall level of self-directed learning

Name of SDL stages	No. of students	Mean	SD
SDL(awareness)	300	4.06	0.65
SDL (learning strategies)		4.06	0.62
SDL(learning activities)		4.09	0.69
SDL (evaluation)		4.04	0.71
Whole sample	300	4.05	0.53

The table above illustrates the results of self-directed learning assessment. It indicates that the highest level of self-directed learning was reported by SDL (learning activities) respondents with a mean score of 4.09 (SD= 0.69). On the other hand, the mean scores of SDL (awareness and learning strategies) respondents were lower (mean= 4.06, SD=0.65 & mean= 4.06, SD=0.62) respectively. Meanwhile, the mean score of SDL (evaluation) respondents was the lowest (Mean=4.04, SD=0.71) in comparison to the overall sample mean (mean= 4.05, SD=0.53). Overall, the analysis demonstrates that respondents have a high level of self-directed learning with a mean score of (M= 4.05, SD= 0.53).

Table 4
Comparison of students' use of technology with respect of institutions (public & private)

Variable	Institution	N	M	SD	t	Df	P
Use of technology	Public	150	52.55	8.03	-.111	298	.912
	Private	150	52.66	8.66			

A t-test was carried out to compare the use of technology by students in public and private sectors. The data presented in the output (see above) indicate that there was no significant difference in the scores between public (M=52.55, SD=8.03) and private sector (M=52.66, SD=8.66; t(298)=-.111, p=.912, two-tailed) students. Thus, based on the results presented in the table above, it can be concluded that the null hypothesis, "there is no significant difference between the use of technology by students in public and private sectors", is accepted.

Table 5
Comparison of students' level of self-directed learning with respect of institutions (public & private)

Variable	Institution	N	M	SD	t	Df	P
Self-directed learning	Public	150	65.28	7.95	.761	298	.447
	Private	150	64.52	9.14			

An independent-samples t-test was conducted to compare the levels of self-directed learning among students from public and private sectors. The data presented in the output above shows that there was no significant difference in the scores of self-directed learning between public sector students (M=65.28, SD 7.95) and private sector students (M=64.52, SD 9.14; t (298) = .761, p = .447, two-tailed). Thus, the null hypothesis that "There is no significant difference in the levels of self-directed learning among public and private sector students" is accepted based on the results presented abov.

Table 6
Relationship between students' use of technology and self-directed learning

Variables	N	r	Sig.(2 tailed)
Use of technology Self-directed learning	300	.481(**)	.000

**p<0.01

To determine the relationship between the use of technology and self-directed learning, a Pearson correlation coefficient was computed. The results in Table 4 revealed a significant correlation between the independent variable (use of technology) and dependent variable (self-directed learning). The statistical analysis indicated a moderate, significant positive correlation between the two variables, with a correlation coefficient of r = .481 and p-value of .000. Therefore, it can be concluded that there is a significant relationship between students' use of technology and self-directed learning. Thus, the hypothesis "There is a statistically significant relationship between students' use of technology and self-directed learning" is supported by the findings.

Discussion

The aim of this study was to investigate the relationship between students' use of technology and self-directed learning. The findings indicated a moderate positive correlation between these two variables, which is consistent with limited research available on this topic. Like Tabassum and Asgher's (2015) study, which found a significant positive relationship between technology use and self-directed learning. This study also found that most students use technology, which is consistent with the results of Dr. Thomas and J. Shuell's study "Students' Perceptions of Technology Use in College Courses". Additionally, this study observed a high level of self-directed learning among students, which is in line with Muqaddes' (2018) study on "The Self-Directed Learning Readiness Level of the Undergraduate Students of Midwife and Nurse in Terms of Sustainability in Nursing and Midwifery Education.

Conclusion

The study aimed to assess the level of technology usage and self-directed learning among university students, and to explore the relationship between these variables. The findings showed that students predominantly use technology, with mobile and mobile applications being used more frequently than laptops and internet. There were no significant differences found between public and private sector students' use of technology or self-directed learning levels. The most notable finding was the significant moderate positive correlation between students' use of technology and self-directed learning. In conclusion, the study found that most university students use various technologies and possess a high level of self-directed learning, and there is a significant positive correlation between the two variables.

Recommendations

Since this study focuses on the students' use of technology and its relationship with self-directed learning, the following recommendations for future research can be made:

1. Researchers should expand the scope of research questions to cover a more diverse and larger sample size and examine various types of technology with self-directed learning at different levels.

2. Investigate the role of educational institutions in providing facilities to students to improve their self-directed learning using technology.

3. Since this study only explored three types of technologies, further research could explore additional types of technology use by students to better understand how technology can be used as an effective pedagogical and educational tool in promoting self-directed learning among today's technology-driven generation of students.

4. Investigate the role of specific technology applications (such as Google Meet and Zoom) in student self-directed learning in online classes, especially during pandemic situations worldwide.

References

Alavi, M., Wheeler, B.C., &Valaich, J.S. (1995).*Using it to re-engineer business education: an exploratory investigation of collaborative tele learning*. MIS Quarterly, 19, 293-312.

Appleton, J.J., Appleton, S.L. Christenson, M.J. Furlong (2008). Student engagement with school*: critical conceptual and methodological issues of the construct Psychology in the Schools, 45* (5), 369-386

Artis, A.B. and Harris, E.G. (2007), Self-Directed Learning and Sales Force Performance: An Integrated Framework*. Journal of Personal Selling and Sales Management*, *27*(1), 9–24.

Aziz, T., Khan, M.B., & Singh, R. (2010). Effects of Information Technology Usage on Student Learning: An Empirical Study in the United States. *International Journal of Management, 27*(2), 205-215.

Barnes, K., Marateo, R.C. & Ferris, S.P. (2007). Teaching and learning with the net generation. *Innovate: Journal of Online Education*, *3*(4).

Beach, P. (2017). A Theoretical Model for Understanding Elementary Teachers' Online Learning Experiences. *Teaching and Teacher Education*, 61, 60–72.

Brookfield, S. D. (2009). In R. Maclean & D. Wilson (Eds.), International handbook of education for the changing world of work*: Bridging academic and vocational learning* 19(7), 2615– 2627.

Cakir, H, Delialioglu, O, Dennis, A, & Duffy, T. (2009). Technology enhanced learning environments for closing the gap in student achievement between regions: *association for the Advancement of Computing in Education Journal*, *17*(4), 301-315

Callaghan, N., & Bower, M. (2012). Learning through social networking sites –the critical role of the teacher. *Educational Media International*, *49*(1), 1–17.

Candy, P. C. (2004). Linking Thinking: Self-Directed Learning in the Digital Age. *Canberra: Department of Education, Science and Training*.

Carey, J. M. (2001). Effective student outcomes: a comparison of online and face-to-face delivery modes. *Deosnews journals*, *11* (9), 8- 12.

Cassady, J.C., (2002).*Assessing the Impact of Technology in Teaching and Learning*. Toronto: John Wiley & Sons.

CAST (2011). *Universal design for learning guidelines version 2*.0. Wakefield, MA.

Fahnoe, C. & Mishra, P. (2013). Do 21st Century Learning Environments Support Self-Directed Learning? Middle School Students' Response to an Intentionally Designed Learning Environment. *Society for Information Technology & Teacher Education International Conference,* 55(2), 3131-3139.

Fishbein, M., &Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research. Reading,* MA: Addison-Wesl.

Fisher, M., King, J., &Tague, G. (2001). Development of a Self-Directed Learning Readiness Scale for Nursing Education. *Nurse Education Today*, *21*(7), 516–525.

Fredricks, J.A., Blumenfeld, P.C. & Paris, A.H. 2004, potential of the concept, state of the evidence. *Review of Educational Research*, *74*(1), 59-109.

Gagne, M. & Shepherd, M. (2001).Distance Learning in Accounting: A Comparison between a Distance and Traditional Graduate Accounting Class. *T.H.E. Journal*, *28*(9), 58-65.

Gibbons, M. (2002). *The self-directed learning handbook: Challenging adolescent students to excel.* San Francisco, CA: Jossey-Bass.

Gilbert, N., & Driscoll, M. (2002). Collaborative Knowledge Building: A Case Study. *Educational Technology Research and Development*, 50, 59–79

Guglielmino, L. M. (1977).Development of the self-directed learning readiness scale. Unpublished doctoral dissertation, University of Georgia. *Dissertation Abstracts International*, *38* (11), 6467.

Hamid, S., Waycott, J., Kurnia, S., & Chang, S. (2015). Understanding students' perceptions of the benefits of online social networking use for teaching and learning. *The Internet and Higher Education*, 26, 1–9.

Harvey, B. J., Rothman, A. I., &Fredker, R. C. (2006). A confirmatory factor analysis of the oddi continuing learning inventory (Ocli).*Adult Education Quarterly*, *56* (3), 188–200.

Hennessy, S., Ruthven, K., & Brindley, S. (2005).teacher perspectives on integrating ICT on subject teaching: commitment, constraints, caution, and change. *Journal of Curriculum Studies*, *37*(2), 155-192.

Jossberger, H., Brand-Gruwel, S., Boshuizen, H., & Wiel, M. (2010).The challenge of self-directed and self-regulated learning in vocational education. *Journal of Vocational Education and Training, 62*(4), 415-440.

Karakas, F., &Manisaligil, A. (2012). Reorienting self-directed learning for the creative digital era. *European Journal of Training and Development*, *36*(7), 712–731.

Kereluik, K., Mishra, P., Fahnoe, C., & Terry, L. (2013). What knowledge of most worth: teacher knowledge for 21st century learning. *Journal of Learning in Teacher Education*, *29*(4), 225-229.

Knowles M.S. (1975). *Self-Directed Learning: A Guide for Learners and Teachers*. Follett Publishing, Chicago, IL.

Lee, K., Tsai, P. S., Chai, C. S., &Koh, J. H. L. (2014). Students' perceptions of self-directed learning and collaborative learning with and without technology. *Journal of Computer Assisted Learning, 30*(5), 425– 437.

Lin, L. (2008). An Online Learning Model to Facilitate Learners' Rights to Education. *Journal of Asynchronous Learning Networks*, *12*(1), 127–143.

Liu, S. (2011). Factors related to pedagogical beliefs of teachers and technology integration, *journal of Computers & Education*, 56, 1012-1022.

Loyens, S. M., Magda, J., &Rikers, R. J. P. (2008). Self-directed learning in problem-based learning and its relationships with self-regulated learning. *Educational Psychology Review, 20*(4), 411–427.

Oddi, L. F. (1986). Development and validation of an instrument to identify self-directed continuing learners. *Adult Education Quarterly*, 36, 97–107

Park, H. (2013). Effect of self-directed learning readiness by learner's interaction on social network games. *Journal of Cases on Information Technology*, *15*(3), 47–60.

Proserpio, L., and Gioia, D. (2007). Teaching the virtual generation. *Academy of Management Learning & Education, 6*(1), 69-80.

Rashid.T, &Asghar.M, (2016). Technology use, self-directed learning, student engagement and academic performance: examining the interrelations*. Computer in Human Behavior, 63*,605-607.

Reiser, R. A. (2002). A history of instructional design and technology. In R. A. Reiser& Dempsey, J. V. (Ed.), *Trends and Issues in Instructional Design and Technology.* NJ: Merrill Prentice Hall

Robertson, J. (2011). The educational affordances of blogs for self-directed learning. *Computers & Education*, *57*(2), 1628–1644.

Song, L., & Hill, J. R. (2007). A Conceptual Model for Understanding Self-Directed Learning in Online Environments. *Journal of Interactive Online Learning*, *6*(1), 27–41.

Staker, H. (2011).The rise of k-12 blended learning: profiles of emerging models. Insight institute. Mountain View, CA.

Sumuer,E.(2018) factors related to college students' self-directed learning with technology. *Australasian Journal of Educational Technology, 34*(4*)*, 30-32.

Williamson SN (2007). Development of a Self-Rating Scale of Self-Directed Learning. Nurse Researcher 14 (2) 66-83.

Younes,M, &Al-Zoubi.S,(2015).   The   impact   of   technologies   on   society: a review. *Journal of Humanities and Social Science, 22*(2), 82-85.

Zehr M (1997) Teaching the teachers. *Technol Counts 17*(11), 23–29