

The Role of Digital Skills and Learning Analytics in Improving Educational Outcomes: A Comprehensive Assessment

Dr. Sheeba Zafar¹

Abstract

This cross-sectional study, explore the, enhancing the educational outcomes, through the integration of digital skills and learning analytics. The major question of the said study is, to enhancing the learning outcome in the higher educational institutions, in the Pakistan, with the uses, of innovation technology in the current era. The research methodology, in the form of survey methods was used, and the higher educational institutions working in the ambit of Pakistan, were taken. The University management, faculty and students were taken as part of population of the present study from public and private universities of Pakistan. The expected, outcome, are the positive impact on the educational outcome, through integration skills were expected. The findings of this study align with the SDG4, a step toward the quality education in Pakistan. The recommendation of the study is a guideline for the policy makers in the field of higher education.

Keywords: Digital Skills, Learning Analytics, Educational Outcomes, Higher Education, Student Engagement, Faculty Development, Women Universities

¹Assistant professor of Management Sciences, Shifa Tameer-e-Millat University, Islamabad,
Email: sheebazafar.dms@stmu.edu.pk

Introduction

In this current era of digital changes and the involvement of the technology in the teaching and learning (Putra et al., 2022). The emerging of the technology and its multi, applications on the learning process, which is leading toward the quality of education, in the form of outcome. This technology, enhancing the skills, utilization of the resources, and time. This also equipping the faculty and teacher, toward the journey of good teacher to excellence teacher and defiantly the output, also leading toward from good to excellence, as also indicated in the SDG4 (Siemen et al., 2022). The innovation of the technology in the educational institutions is also equally important as for the learner and teacher as well.

The uses of multiple techniques and applications for the uses of technology and use in the learning analytics, and reports about the data collection are helpful for the learning process. The said action, enhance the outcome of the educational institutions in the form of prospective resources for the entire world in the form of human capital and innovation for the various aspects of life (Dawson et al., 2021). This said research aligns as per the United Nations' Sustainable Development Goal 4 (Quality Education), which leads toward the advocacy of the quality and inclusive education. Moreover, it also linked with the SDG9 as, Industry, Innovation, and

Infrastructure) for the purpose to promote the integration of the newly and innovative technology in the education system.

It is concluded from the above, that the innovation and integration of the technology, plays a crucial role for enhancing the output of the educational resources in the form of human capital.

Rationale of the Study

The uses of the technology are rapidly changing the dynamics of the world, with the uses of new innovation. These are the big challenges for the country like Pakistan. The use of digital technology and other data driven is more significant for the country like Pakistan for the sustainability and growth in the current digital era (Ahmed et al., 2022). The uses of technology are impacting on the academic achievement, learning and assessment process of the educational institutions, which is leading toward the quality aspect of education, which is need of the time. The adaptation of the digital technology in the educational institution is the need of the (Latif et al., 2021).

The need of the time as digital skills, from roll out of basic computer skills to the reach out of the utilization of the current application in the whole educational process from initiation of the learning to assessment for the outcome, plays a pivotal, role for the improvement of the quality education, which impact on the community of the world at large scale (khan, 2020). Moreover, it is evident from the various studies that Pakistan is a dotting world innovation technique in the form of technology for improving the outcome of the educational institutions, and its evident form the result that today, learner, teacher and institutions are equipped with the digital technology tool and techniques. The applications of the digital technology are in practice as well (Gunter et al., 2018).

It is concluded from that the survival of the institution, learner and teacher is impossible without adopting the digital technology. The current study will scan the integration of digital technology skills for the enhancement of the higher education learning analytics for outcomes.

Statement of the Problem

In current era, technology evolves in every field of life, and as the major sources of human capital is the educational institutions. The technology is more, essential for the educational institutions. Now a days, institutional are opting technology for inculcation in the leaner and teachers. The adaptation of the innovation and digital skills for enhancing the learning analytical are very important. Technology is plying important role for the adaptation of all that. In currently Pakistan's higher education sectors having multiple faces challenges like varying digital competencies in the adaptation of learning analytics. s among teachers there, limited understanding of learning analytics, and the also lack in the training insufficient training. These are affecting on their utilizations of the skills in the current era.

Digital literacy got reorganization at large scale and adopted in the teaching learning process. The country like Pakistan is also evolves in the adaptation of the learning analytics and

many of the resources are utilizing for this purpose. This is also pointed out in the SDGs as evident by (Field,2020).

Keeping aligns all the views the researcher, adopt the topic “enhancing educational outcomes through the integration of digital skills and learning analytics”.

Research Question of the Study

The research questions of the study were as

- i. Are digital competency levels among faculty, management and students in higher education institutions meet the current needs?
- ii. Is application of learning analytics in instructional planning, delivery, and assessment is co current in practice is higher educational institutions.
- iii. Does the digital skills and learning analytics, impact on student engagement, performance, academic achievement in higher educational institutions?

Significance of the Study

The study enhancing educational outcomes through the integration of digital skills and learning outcomes. The study is significant with multiple point of views, the few and narrated here for the clarity and understanding.

The current study under investigation will bridge the gap between digital skills and learning analytical in the higher educational institutions. This study will also impact on the policy maker, technologist for more innovation and developing the creativity. The study will also reduce the gap between the learner, management and teacher of the higher educational institutions. The study will also open the new corridor for the policy analytics and state official for policy making. This study will also highlight the importance of the SGDs and will develop the steps toward the implication of the SDGs.

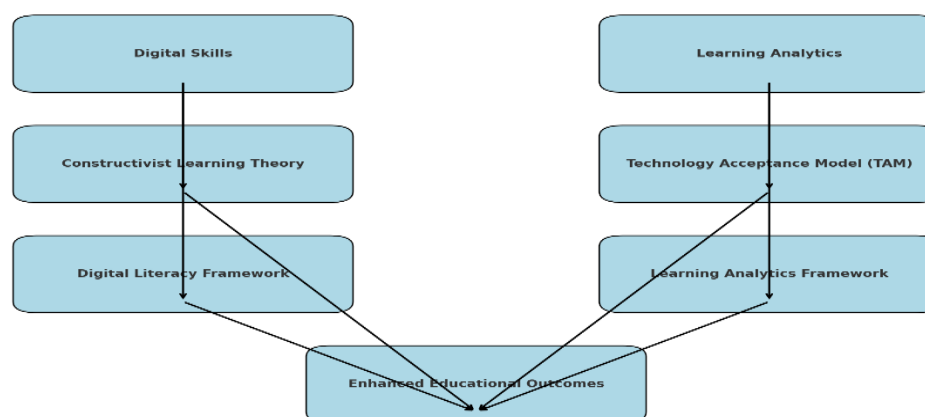
Review of Literature

The importance of digital skills is need of the time for the learner, tethers and institutions of higher education (Tsai et al., 2012). It is evident that, excellence digital competencies, as effective use of tools, market-based curriculum development and critical content evaluation, and technology-based problem-solving, significantly enhance learner engagement and human capital readiness. Many of the researches evident that, learner with advanced digital skills tend to perform better academically, demonstrating improved time management, collaboration, and problem-solving abilities as compared to other (Gunter et al., 2021). As learning analytics, which involves collecting and analyzing learner data, plays a crucial role in progression of academic activities and personalizing learning experiences (Siemens, et at., 2017). It is evident and proven from research that, identifying at-risk learners early, learning analytics enables data-driven interventions that can improve learner learning, course design, and retention rates at higher educational institutions (Nistor et al., 2018; Afaq et al., 2022).

However, the integration of digital skills with learning analytics offers significant potential for transforming higher education in the any region. Teachers proficient in digital technologies can leverage learning analytics to create personalized, data-driven learning environments and excellent outcomes, as excellence teachers produced the excellence learner, which is core capital of the society (Mishra et al., 2022). Equipped the teacher with the innovations and skills as important as solider equipped with weapons for more effective working. (Kirkwood et al., 2014). Integrations of the technology, enhance the potential of the teacher. (Pardo et al., 2016). In country like Pakistan, the adoption of digital skills and learning analytics is still in its early stages, as many of the learner as teachers are not willing to adopt that, but their survival is not sustainable without this (Shah et al., 2017). Important to note that, there is growing recognition and trends of the need to enhance digital literacy and utilize learning analytics to improve educational outcomes and align with global educational standards (Ali et al., 2018).

Theoretical Framework

The conceptual frame work of the study and the graphical illustration areas:



Research Methodology

The study is quantitative and cross-sectional approach is used for the present study for its finalization. The target population of the said study taken under the investigation of the said study is management, faculty and student of the universities of Pakistan. The details of the universities are taken for the said study areas:

The target population includes students, faculty, and senior management from six universities in Pakistan.

Women Universities

- i. Fatima Jinnah Women University (FJWU), Pakistan.
- ii. Lahore College for Women University (LCWU), Pakistan.
- iii. Women University Mardan (WUM), Pakistan.

Male/Co-Educational Universities

- i. National University of Sciences and Technology (NUST), Pakistan.
- ii. COMSATS University Islamabad, Pakistan.
- iii. PMAS-Arid Agriculture University, Pakistan.

The population included approximately 18,000 students, 1,500 faculty members, and 300 senior management officials across these universities (Higher Education Commission Pakistan, 2022).

Table 1: Population of the study

Category	Number of Students	Number of Faculty	Number of Senior Management
Women Universities	8,000	600	120
Male/Co-Ed Universities	10,000	900	180
Total	18,000	1,500	300

Source: www.hec.gov.pk

Sampling Strategy

A stratified random sampling method will use to ensure proportional representation of students, faculty, and management. Participants were randomly selected based on role and gender. The sample size, calculated using Krejcie and Morgan's formula, aimed for a 95% confidence level and a 5% margin of error, targeting around 800 participants.

Table 2: Sample of the Study

Category	Sample of Students	Sample of Faculty	Sample of Senior Management
Women Universities	300	70	30
Male/Co-Ed Universities	350	50	20
Total	650	120	50
Women Universities	300	70	30

Source: www.hec.gov.pk

Data Analysis of the study

The application of the advance version of the SPSS version 26 was uses for the analysis of the data of the study. The application of the descriptive and inferential application of the

statistics were used in the study. The said application is applied for the exploring the relationship, among digital skills, learning analytics and educational outcomes as a comprehension of the assessment.

Table 3: Descriptive Statistics of Key Variables (N = 820)

Variable	M	SD	Minimum	Maximum
Digital Skills	4.12	0.54	2.6	5.0
Learning Analytics Usage	3.79	0.61	2.4	5.0
Educational Outcomes	4.25	0.48	3.1	5.0

Note. M = Mean, SD = Standard Deviation.

Findings of the study

Independent Samples t-Test

The result of the comparison of digital skills between students in women-only and co-educational universities revealed a significant difference

t(638) = 5.72, p < .001, indicating that students in co-educational institutions demonstrated significantly higher digital skills (M = 4.3, SD = 0.5) compared to those in women-only universities (M = 3.9, SD = 0.7).

ANOVA

A one-way ANOVA showed significant differences in the use of learning analytics among students, faculty, and senior management in the universities of Pakistan for the said study.

F(2, 827) = 6.13, p < .01, with post hoc Tukey tests indicating senior management used analytics more frequently than faculty and students.

Pearson Correlation

The application of the Pearson correlation of the study areas:

Table 4: Pearson Correlation Matrix

Variable	1	2	3
Digital Skills	—		
Learning Analytics	.57**	—	
Educational Outcomes	.60**	.67**	—

Note. N = 820. p < .01.

Multiple Regression Analysis

A multiple regression was conducted to predict educational outcomes from digital skills and learning analytics usage.

Table 5: Multiple Regression Results Predicting Educational Outcomes

Predictor	B	SE B	β	t	p
Constant	1.80	0.16	—	12.10	<.001
Digital Skills	0.42	0.07	.42	6.82	<.001
Learning Analytics Usage	0.53	0.06	.48	7.44	<.001

$R^2 = .56$, $F(2, 797) = 127.80$, $p < .001$

Discussion of the Study

The above analysis of the study revealed a strong between all the variables of the study as, digital skills, learning analytics usage, and educational outcomes. It is evident from the findings of the study, that students from co-educational universities reported significantly higher digital proficiency. The finding also supported by as that more access to digital infrastructure and co-curricular digital exposure, aligning with prior studies (UNESCO, 2021).

Furthermore, it is evident from the findings of the study that, learning analytics was more in used by the senior management of the university, and it is also evident that, institutional leadership are more engaged in the informed decision making as compare to the faculty and student of the universities of Pakistan. This gap pointed out the need of the digital skills and learning for the faculty and students. As the uses in the pedagogy forms is less in the class, during teaching learning process by the learning and teacher.

The result also reflects by the string positive correlation between learning analytics and educational outcomes ($r = .60$) evident that the educational activities at universities in the form of data driven, proper strategic planning, feedback of the learner, teacher, management and employers are very important for reforms of all these for alignment. Moreover, the result emphasized, the need of the learning analytics and digital skills for the learning as good resource for the community development in the society.

Conclusion of the Study

The present study concluded that the digital skills, and learning analytics are the key driver of the outcomes of the study in Pakistan Higher Educational Institutions. It is more concluded from the findings that, the educational institutions, reflects the impact of digital technology and learning outcomes, as supported by the students, faculty and senior management of the universities. It is also evident from the result, that focus in the literature that, to reduce the job stress of the work at universities, need the supports of technology. The same occlusion is supported by (Chaudhry et al., 2017).

Moreover, the analysis supports the need of the capacity buildings of all as students, faculty and management for digital skills as the key needs of the current era as comprehensive assessment.

Recommendations

The recommendation of the study, driven from the conclusions as:

- i. The clear learning analytics policies are need to establish for planning, curriculum, and assessment, that leads towards educational outcomes.
- ii. In women educational institution, a specified budget needs to proposed for the digital enhancement.
- iii. The comprehensive training, for the faculty needs to proposed for the learning analytics dashboard, data informed pedagogical decisions, and personalized student support systems.
- iv. Practical application needs to incorporate at undergraduate level for the participatory approach of learning digital skill, for involvement in online feedback through applications.
- v. It is proposed for the faculty/ ORIC of the university to conduct, action research project.

References

1. Ali, S., Ashraf, M., & Rizvi, S. (2018). The role of learning analytics in improving higher education in Pakistan. *International Journal of Educational Development*, 58, 79-85.
2. Afaq, A., Khan, Q., Arshad, A., Sibte-e-Ali, M., & Malik, A. A. (2022). The job satisfaction of academic staff in higher educational institutes. *Journal of South Asian Studies*, 10(1), 95-101.
3. Bozkurt, A., & Sharma, R. C. (2021). Emergency remote teaching in a time of global crisis due to the Coronavirus pandemic. *Asian Journal of Distance Education*, 15(1), 1–6.
4. Chaudhry, M. A., & Niazi, H. K. (2017). Job stress of academia and its effect on their performance in public sector universities of Punjab. *Pakistan Journal of Education*, 34(2), 101-118.
5. Dawson, S., Bakharia, A., & Tan, J. P. L. (2015). Learning analytics to support students' success: Implementing learning analytics in a higher education context. *Journal of Learning Analytics*, 2(2), 1-19.
6. Field, A. (2020). *Discovering statistics using IBM SPSS statistics* (5th ed.). Sage Publications.
7. Gunter, J. L., Ray, B., & Kimmons, R. (2019). Examining the role of digital literacy in academic success: A case study. *Computers in Human Behavior*, 96, 1-9.
8. Haggerty, M. (2018). The use of learning analytics in higher education: A review of the current landscape. *Journal of Educational Technology*, 17(2), 91-104.
9. Higher Education Commission Pakistan. (2022). *Annual report 2022*.
10. Khan, R. (2020). The role of digital literacy in improving educational outcomes in Pakistan. *Journal of Educational Technology*, 15(3), 40-55.

12. Koehler, M. J., Mishra, P., Kereluik, K., Shin, T. S., & Graham, C. R. (2022). The Technological Pedagogical Content Knowledge (TPACK) framework: Past, present, and future. *Computers & Education*, 186, 104522.
13. Latif, A., Jamshed, S., & Chaudhry, M. A. (2021). Bridging the digital divide in Pakistan's higher education sector: Challenges and opportunities. *Pakistan Journal of Distance & Online Learning*, 7(1), 45–60.
14. Mahmood, K. (2021). The need for learning analytics in Pakistan's educational institutions. *Asian Journal of Distance Education*, 16(1), 34–45.
15. .Shah, S. Z. A., & Raza, S. A. (2017). Overcoming challenges in integrating learning analytics in Pakistani higher education institutions. *Asian Journal of Education and Social Studies*, 3(2), 1-9.
16. Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning*, 2(1).
17. Siemens, G. (2013). Learning analytics: The emergence of a discipline. *American Behavioral Scientist*, 57(10), 1364-1376.
18. Tsai, Y. S., & Chai, C. S. (2012). The development of a framework for integrating learning analytics and e-learning design. *Educational Technology & Society*, 15(2), 47-62.
19. United Nations Educational, Scientific and Cultural Organization (UNESCO). (2015). Education for all 2015 national review: Pakistan. UNESCO.
20. United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. United Nations.