

Received: 05 August 2024, Accepted: 15 September 2024

DOI: <https://doi.org/10.33282/rr.vx9i2.05>

The Impact of Teachers' Pedagogic Quality under the TPACK Framework on Student Success at Public and Private Universities in Lahore

¹Atiqa Shib Khan,²Irfana Rasul,³Saima Malik⁴Mahwish Mumtaz Niazi

¹Independent Researcher, Pakistan atiqasahibkhan@gmail.com

²University of Education, Lahore irfana.rasul@ue.edu.pk

³Higher Education Department, Pakistan saimamalikarshad666@gmail.com

⁴National College of Business Administration and Economics sub-Campus Multan

mahwishmumtazniazi7@gmail.com

ABSTRACT

This study aimed to examine the impact of teachers' pedagogic and linguistic quality on student success at public and private universities in Lahore. The research addressed the concerns about how teachers' pedagogic quality impacted the students' success. The study unfolded the interactive effect of various factors: 1) technological knowledge, 2) pedagogical knowledge, 3) content knowledge, 4) student engagement, 5) student satisfaction) and 6) student achievement. The study was quantitative in nature, and correlational research methodology was used. A multistage sampling technique was used to select the sample for the study. The sample constituted 1200 undergraduate students of the 5th and 6th semester from two programs (IT and Business) of 6 universities (3 private and 3 public) situated in the province of Punjab (Lahore). The data were collected through a questionnaire. Data were cleaned, organized, and stored through SPSS version 21. Advanced statistical techniques like correlations, and bivariate linear regression were used to answer research questions by using appropriate statistical software. The study has confirmed that there was a significant relationship between teachers' pedagogic quality and student success. The regression analysis accentuated the predictive value of teachers' pedagogic quality for student success.

Keywords: Technological Pedagogical Content Knowledge (TPACK), Teachers' Pedagogic quality.

Introduction

A way for a country to develop is through education, which can raise the level of living across the board. Because the primary goal of education is to humanize people, particularly in the contemporary industrial 4.0 era, it is thought that a person can live independently and responsibly

through education (Lee, 2016; Astuti et al., 2019; Heriyanto et al., 2019). Teachers must be able to manage their students' learning while also encouraging a collaborative and communicative environment (Alam & Dewi, 2020; Arifin & Hermino, 2020; Sumyadi et al., 2020). One method for a country to progress is through education.

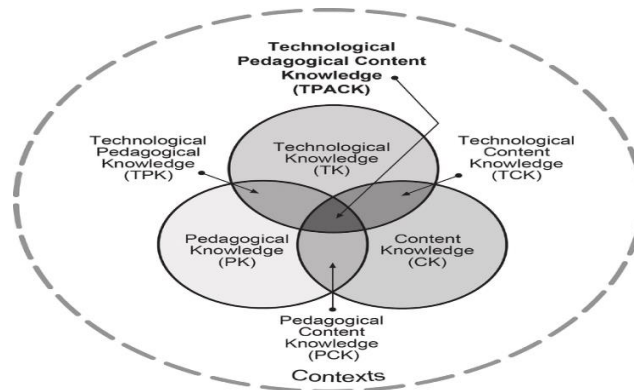
In the constantly evolving higher education landscape, comprehending the impact of teachers' pedagogic quality on student success holds paramount importance. In the 21st-century, engagement, satisfaction, and achievement stand out as three critical indicators of student success. In this study, we will investigate how these crucial components of student performance are impacted by the pedagogic quality of teachers, including their content understanding, technological expertise, and pedagogical expertise. For teachers to effectively deliver lessons and foster critical thinking in their students, subject-matter expertise is a necessity. Ball and Hill (2020) highlighted that subject-specific knowledge the knowledge that "teachers possess a deep understanding of the subjects they teach," including understanding of key concepts, principles, and processes in their discipline, as well as ways in which that knowledge can be organized and communicated to students. It is crucial for educators to effectively convey information in a manner that captivates students' interest and facilitates comprehension. In today's classrooms, where digital technologies are increasingly used in higher education settings, technological expertise, such as an understanding of technology, is also required. Finally, pedagogical knowledge helps to create effective instructional practices, which can increase student engagement, satisfaction, and achievement. This information includes knowledge of teaching methods and learning theories.

According to research, a teacher's pedagogical effectiveness can significantly affect students' academic performance. "The combination of the teacher's professional knowledge, beliefs, and competencies," as well as the quality of their instructional practices and the degree of their responsiveness to the needs and traits of learners. Baumert et al. (2021). According to Darling-Hammond (2006), teacher subject-matter expertise and students' math and science achievement are positively associated. Similar findings were made by Sari et al. (2013) and Chen et al. (2016) in their investigations, which both claimed that teachers' pedagogical knowledge was positively associated with student engagement, satisfaction, and achievement. Moreover, pedagogically sound instructors can support meeting the needs of students in the twenty-first century. Learning must apply to engage with the actual world, according to Dewey (1929), for it to be effective. Students can better prepare for the needs of the 21st-century economy by receiving high-quality instructional expertise that encourages interaction with course material.

The pedagogic quality of teachers has been a significant determinant of students as it is directly related to the development of their engagement and satisfaction. Teacher's pedagogic quality is provided by Kunter and colleagues (2021), who describe it as the combination of the instructor's understanding, beliefs, and competencies, as well as the quality of their instructional practices and the degree to which they are responsive to the qualities and requirements students.

Figure 1

Content Knowledge Combined with Technology and Pedagogy (TPACK)



Content Knowledge

Content knowledge, also known as subject matter knowledge, encompasses "the understanding of a specific subject area, comprising fundamental concepts, skills, and processes relevant to that subject" (Ruining, 2018, p. 166). In the context of literature education, this would involve a teacher's understanding of literary genres, themes, and historical contexts.

Technological Knowledge

Technological knowledge refers to "knowledge of tools, techniques, and procedures related to the application of subject matter knowledge" (Ruining, 2018, p. 166). In the context of literature education, this would involve a teacher's proficiency in using educational technology, software, and other tools to improve the educational process, like online resources for literary analysis or digital tools for student writing.

Pedagogical Knowledge

Pedagogical knowledge entails understanding as well as competencies required to facilitate student learning and growth (Ruining, 2018). In the context of literature education, this would involve a teacher's ability to design and implement effective lesson plans, provide feedback to students, and create a positive and inclusive classroom environment. Brookfield (2015) emphasized the significance of implementing active learning techniques as well as inquiry-based strategies to keep students interested in higher-order thinking tasks. By posing open-ended questions, facilitating

discussions, and encouraging experimentation, educators can cultivate students' ability to analyze information critically and apply knowledge to real-world situations. According to Tomlinson (2014), effective differentiation requires teachers to understand students' strengths, interests, and learning styles, and instruction accordingly. By employing varied instructional approaches and providing scaffolding and support, teachers can create inclusive learning environments that address the individual needs of all learners.

Pedagogical knowledge is a cornerstone of effective teaching and requires continuous professional development. Guskey and Yoon (2009) highlighted the importance of ongoing learning and reflection in improving teaching practices and student outcomes. By engaging in professional learning communities, attending workshops, and seeking feedback, educators can deepen their pedagogical knowledge and refine their instructional practices to accommodate students' changing demands.

Recent research has highlighted the pivotal function of TPACK, or technologically pedagogical content knowledge, in facilitating student success across various educational settings, including public and private universities. Johnson and Smith (2023) explored the interaction between teachers' TPACK levels and student success, demonstrating a strong positive correlation between TPACK competencies as well as positive learning outcomes. Additionally, Garcia et al. (2024), highlighted long-term effects of TPACK on student achievement and engagement over time.

Furthermore, Lee and Wang (2023), conducted a meta-analysis synthesizing findings from multiple studies on TPACK and student success, confirming the consistent association between TPACK and positive student outcomes. These recent studies collectively underscore the crucial role of TPACK in facilitating student success across diverse educational contexts.

This literature review highlights the pivotal role of effective teaching practices, in terms of pedagogic quality and TPACK, in promoting student success in higher education institutions. By prioritizing teacher development and fostering a culture of innovation in teaching methodologies, Universities have the power to improve student achievement and further societal progress.

Three Key indicators of student performance at the university level, such as engagement, satisfaction, and achievement are significantly impacted by teachers' pedagogic quality, which includes content, technological, and pedagogical knowledge. The demands of 21st-century students can be met in a fast-evolving educational environment with the aid of effective pedagogical approaches. Because of how students' needs are evolving, professors' roles in higher institutions have experienced major changes in the 21st century. Teachers must have a diverse set of pedagogical, technological, and content expertise to effectively fulfill the demands of 21st-century students. It has been demonstrated that a student's success at the university level is significantly influenced by teachers' educational abilities.

Statement of the Problem

This study examines the impact of teachers' pedagogic quality on student success at public and private universities in Lahore, Pakistan. It is significant because students' academic achievements are intricately tied to the quality of their education, with instructors' contributions to effective pedagogy being crucial. By comprehending the impact of teachers' pedagogic quality on student success, policymakers and educators can enhance the quality of education provided to students.

Research Questions

Q1: What is the interactive effect of content knowledge, technical knowledge, pedagogical knowledge, student engagement, student satisfaction, and student achievement on student success considering perceptions of the students enrolled in public and private universities of Lahore?

Q2: What is the predictive value of teachers' pedagogic quality to ensure student success considering perceptions of the students enrolled in public and private universities?

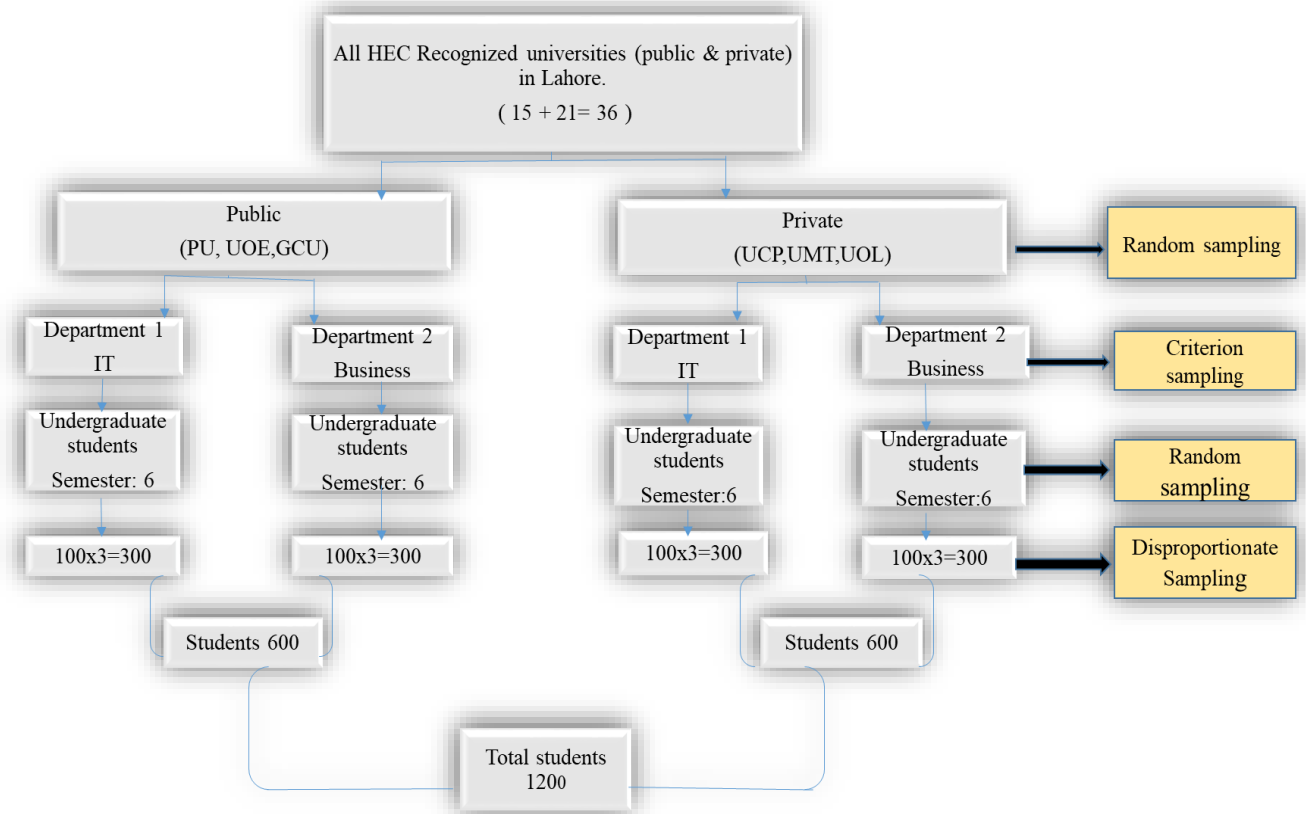
Methodology

The study employed a quantitative research design rooted in the post-positivist paradigm. Data was collected using a survey questionnaire focused on two main variables: teachers' pedagogical quality (various interactions of pedagogical and technological knowledge) and student success (engagement, satisfaction, and achievement). These variables were quantified and analyzed using a conceptual framework.

The population included undergraduate students from public and private universities in Lahore, with the study delimited to HEC-recognized W4 category universities. A multistage sampling process selected six universities (three public, three private), focusing on IT and Business programs. The student sample included 1200 participants, with 600 students from each program, selected through random sampling.

Figure 1

Sampling Flow Chart



A survey questionnaire is used for quantifying the participants' choices, feelings, and likings (Rahi, 2017). An adapted questionnaire consisting of closed-ended questions was used to gather respondents' opinions for this research. There were five sections in the questionnaire. Section I collected information about demographic factors, Section II extracted information about teachers' pedagogical quality (content knowledge, technical knowledge, and pedagogical knowledge), and Section iii collected information about students' success (student engagement, student satisfaction, and student achievement). The final questionnaire was administered across all six universities in Lahore, encompassing three private and three public institutions. Subsequently, all collected data experienced meticulous cleaning, organization, and storage utilizing SPSS version 21. Descriptive analysis constituted the initial level of examination, involving the calculation of means, percentages, and standard deviations. Transitioning to the second level of analysis, inferential

techniques were applied to address the research questions. Advanced statistical methods such as correlations and bivariate regression were applied utilizing appropriate statistical software. The comprehensive approach aimed to derive meaningful insights from the data. To guarantee the continuity and integrity of the study process, all data were securely saved in both digital and hard copy formats, mitigating any potential inconveniences, and contributing to the timely completion of the research endeavor.

Data Analysis and Findings

Q1. “What is the interactive effect of content knowledge, technical knowledge, pedagogical knowledge, student engagement, student satisfaction, and student achievement on student success considering perceptions of the students of public and private universities of Lahore?”

To answer Research question no 1, Pearson product-moment correlation analysis was employed to explore the relationships among all the factors. Pearson product-moment correlation was used to examine the relation between variables (Gürler, 2015). Pearson product-moment correlation was applied to determine the relation among all the extracted factors: Interaction between Pedagogical Content Knowledge (PCK), Interaction between Technological Pedagogical Knowledge (TPK), Interaction between Technological Content Knowledge (TCK), Interaction between Technological, Pedagogical, Content Knowledge (TPACK), and Student Success (Student Engagement (SE), Student Satisfaction (SS), and Student Achievement (SA). Most of the factors under study were found to be positively and significantly correlated with each other. The details are explained below:

The findings indicated that a highly strong correlation was found between factor pedagogical content knowledge (PCK) and interaction between technological pedagogical knowledge (TPK) ($r=.871^{**}$; $p<.000$); pedagogical content knowledge (PCK), technological content knowledge (TCK), and technological pedagogical content knowledge (TPACK) had strong correlation ($r=.797^{**}$; $p<.000$; $r=.738^{**}$; $p<.000$). Moreover, pedagogical and content knowledge (PCK) had also a moderate correlation ($r=.625^{**}$; $p<.000$) with student engagement However, also a moderate correlation was found between pedagogical content knowledge(PCK), student satisfaction, and student Achievement ($r=.550^{**}$; $p<.000$; $r=.554^{**}$; $p<.000$).

Additionally, technological pedagogical knowledge(TPK) had a highly strong correlation ($r=.869^{**}$; $p<.000$; $r=.812^{**}$; $p<.000$) with technological content knowledge (TCK) and technological pedagogical, content knowledge(TPACK) similarly, a moderate correlation was found between technological pedagogical knowledge (PCK) and student engagement, satisfaction, and Achievement ($r=.685^{**}$; $p<.000$; $r=.610^{**}$; $p<.000$; $r=.613^{**}$; $p<.000$).

Furthermore, technological content knowledge (TCK) had highly strong positive correlation ($r=.927^{**}$; $p<.000$) with technological pedagogical content knowledge(TPACK). Moreover, technological content knowledge(TCK) had strong correlation ($r=.792^{**}$; $p<.000$) with student

engagement. However, a moderate correlation ($r=.690^{**}$; $p<.000$; $r=.699^{**}$; $p<.000$) was found between technological content knowledge(PCK), student satisfaction, and student Achievement.

Additionally, technological pedagogical, content knowledge (TPACK)had highly strong correlation ($r=.859^{**}$; $p<.000$) with student engagement and had Strong correlation ($r=.751^{**}$; $p<.000$; $r=.755^{**}$; $p<.000$) with student satisfaction and achievement. Student engagement had a highly strong relationship with student satisfaction and student achievement ($r=.831^{**}$; $p<.000$; $r=.816^{**}$; $p<.000$).

Similarly, a highly strong correlation ($r=.873^{**}$; $p<.000$) was found between student satisfaction and student achievement. Overall, the study indicates strong interrelations among different factors of pedagogical and technological knowledge, highlighting their significant impact on student success, such as engagement, achievement, and satisfaction.

Table 1

Correlation matrix of factors influencing student success to higher education institutions in Lahore

		PCK	TPK	TCK	TPACK	SE	SS	SA
PCK	Pearson Correlation	1	.871 ^{**}	.797 ^{**}	.738 ^{**}	.625 ^{**}	.550 ^{**}	.554 ^{**}
TPK	Pearson Correlation		1	.869 ^{**}	.812 ^{**}	.685 ^{**}	.610 ^{**}	.613 ^{**}
TCK	Pearson Correlation			1	.927 ^{**}	.792 ^{**}	.690 ^{**}	.699 ^{**}
TPACK	Pearson Correlation				1	.859 ^{**}	.751 ^{**}	.755 ^{**}
SE	Pearson Correlation					1	.831 ^{**}	.816 ^{**}
SS	Pearson Correlation						1	.873 ^{**}

Q2. “What is the predictive value of teachers’ pedagogical quality to ensure Student Success considering perceptions of the students enrolled in public and private universities of Lahore?”

To respond to Research, Question no 2, A bivariate regression analysis was conducted to explore the relationship between two variables: Technological, Pedagogical, Content Knowledge (TPACK) and Student Success (SESA). As suggested by the correlation analysis results, both factors were discovered to have a strong and positive correlation with one another. Bivariate regression analysis was conducted to determine the predictive value of the variable (TPACK) for Student Success (SESA). The conceptual framework identified two main variables, out of which one variable— Technological Pedagogical Content Knowledge (TPACK), was treated as an independent variable, and one variable—Student Success (SESA) regarded as the dependent variable. The factors of Technological Pedagogical Content Knowledge (TPACK) and Student Success (SESA) were included in the table to further skew the outcomes.

Table 2

Bivariate Linear Regression (Student Success as Dependent Variable)

	Model	B	t-value	p-value
1	(Constant)		12.807	.000
	TPACK	.835	52,614	.000

The model illustrated that Technological, Pedagogical, and Content Knowledge(TPACK) was the only factor accountable for 80% of the variation in student success. (SESA) to higher education institutions ($r=.835$; $P=.000$).

The findings of regression analysis demonstrated that the interaction between technological, pedagogical, and content knowledge(TPACK) appeared to be the most influential predictor of teacher pedagogic quality (TPQ) and student success (SESA).

Discussion and Conclusion

The study concluded that Pedagogical Content Knowledge (PCK) has strong positive correlations with Technological Pedagogical Knowledge (TPK), Technological Content Knowledge (TCK),

and Technological Pedagogical Content Knowledge (TPACK), highlighting the crucial role of integrating pedagogy and technology in enhancing student success. PCK also showed moderate correlations with student engagement, satisfaction, and achievement, indicating its broader influence on student experiences.

TPK similarly demonstrated strong correlations with TCK and TPACK, emphasizing the importance of combining pedagogical strategies with technology. It also moderately correlated with student success outcomes. TCK showed strong correlations with TPACK and student engagement, reinforcing the role of technological proficiency in effective teaching.

Overall, the findings emphasize the interconnectedness of pedagogical and technological knowledge in promoting student success.

The study's findings underscore the predictive value of teachers' TPACK in fostering student success across public and private universities, accounting for 80% of the variance in student outcomes. TPACK emerged as the most influential factor in promoting both teacher pedagogic quality and student success. Previous studies (e.g., Johnson & Smith, 2023; Garcia et al., 2024) confirmed TPACK's long-term impact on student achievement and engagement. Meta-analyses by Lee & Wang (2023) also validated the universal relevance of TPACK in enhancing student outcomes.

These findings emphasize the need for educators to effectively integrate technology, pedagogy, and content knowledge to improve student engagement, satisfaction, and achievement. Investing in developing teachers' TPACK competencies is crucial for improving educational outcomes in higher education institutions.

Recommendations for Future Research

The limitations of the suggest several recommendations for upcoming research endeavors to address gaps and enhance the robustness of findings:

Diversified Sampling: Future studies should endeavor to include universities from a broader range of geographical locations, particularly from underprivileged and remote areas. This would offer a more comprehensive perspective on the factors influencing student success, potentially leading to findings that are more representative and generalizable.

Expanded Academic Disciplines: While this study focused on Information Technology and Business School faculties, future investigations should encompass a wider array of academic disciplines to capture a more diverse range of perspectives. Including disciplines such as engineering, medicine, humanities, and social sciences would enrich the understanding of student success across various fields.

Inclusion of Postgraduate Students: To provide a holistic view of student success, future research should include postgraduate students alongside undergraduates. Comparing the perspectives of these two cohorts could yield valuable insights into how perceptions of success evolve at different stages of academic advancement.

Exploration of Longitudinal Data: Employing longitudinal research designs would enable researchers to track changes in student perceptions over time, offering deeper insights into the enduring nature of factors influencing student success.

Mixed-Methods Approach: Complementing quantitative surveys with qualitative or mixed-methods approaches would allow for a more nuanced understanding of student perceptions. This approach could help uncover underlying reasons behind quantitative findings and provide richer context to the study outcomes.

Involvement of Key Stakeholders: Future studies should involve key stakeholders such as administrators, department heads, teachers, and policymakers to gain a more holistic approaches toward dynamics within educational institutions. Their perspectives could offer valuable insights for informing policy and practice.

By sorting out these recommendations, research for future endeavors can overcome the limitations outlined in this research and contribute to the better understanding of the factors influencing student success at higher education level.

References

- Astuti, I. P., Wardani, D. K., & Adnyana, I. K. (2019). The effect of service quality, price perception, and brand image on customer satisfaction and loyalty: A study on budget hotels in Bali. *International Journal of Applied Business and Economic Research*, 17(11), 281-294. Serials, New Delhi, India.
- Ball, D. L., & Bass, H. (2009). With an eye on the mathematical horizon: Knowing mathematics for teaching to learners' mathematical futures. *The Mathematics Enthusiast*, 6(1), 3-17. University of Montana, Missoula, Montana, USA.
- Barnett, J., & Hallam, R. (2016). The impact of updated and relevant content on student satisfaction. *Educational Studies*, 42(2), 187-201. Taylor & Francis, Abingdon, United Kingdom.
- Brookfield, S. D. (2015). *The Skillful Teacher: On Technique, Trust, and Responsiveness in the Classroom* (3rd ed.). Jossey-Bass, San Francisco, California, USA.
- Chen, Y., Lu, C., Lin, H., Huang, T., & Lu, Y. (2016). Teacher technological pedagogical content knowledge and student achievement: A Multilevel Analysis. *Journal of Educational Technology & Society*, 19(3), 141–153. International Forum of Educational Technology & Society (IFETS), Taipei, Taiwan.
- Darling-Hammond, L. (2006). Constructing 21st-Century Teacher Education. *Journal of Teacher Education*, 57(3), 1–15. Sage Publications, Thousand Oaks, California, USA.
- Dewi, E. R., & Alam, A. (2020). The effect of organizational culture, organizational commitment, and job satisfaction on employee performance: The mediating role of employee engagement. *International Journal of Psychosocial Rehabilitation*, 24(10), 4078-4089.

- Garcia, M. B., Garcia, P. S., Maaliw, R. R., Lagrazon, P. G. G., Arif, Y. M., Ofosu-Ampong, K., ... & Vaithilingam, C. A. (2024). Technoethical Considerations for Advancing Health Literacy and Medical Practice: A Posthumanist Framework in the Age of Healthcare 5.0. In *Emerging Technologies for Health Literacy and Medical Practice* (pp. 1-19). IGI Global.
- Guskey, T. R., & Yoon, K. S. (2009). What works in professional development?. *Phi delta kappan*, 90(7), 495-500. Phi Delta Kappa International.
- Heriyanto, A., Mappatampo, A., & La Moli, R. (2019). The effect of transformational leadership, job satisfaction, and organizational commitment on employee performance: The mediating role of organizational citizenship behavior. *International Journal of Scientific and Research Publications*, 9(4), 549-555. International Association of Scientific Innovation and Research (IASIR).
- Hermino, A., & Arifin, H. S. (2020). The influence of transformational leadership and job satisfaction on employee engagement: The mediating role of organizational commitment. *Journal of Talent Development and Excellence*, 12(2s), 1911-1921. International Research Association for Talent Development and Excellence (IRATDE).
- Hill, H. C., & Ball, D. L. (2020). Content knowledge for teaching: What makes it special? *Journal of Teacher Education*, 71(5), 427-439. Sage Publications.
- Johnson, A., & Smith, B. (2023). Enhancing Teachers' TPACK and Self-Efficacy Through Content-Based Technology Professional Development. Springer.
- Johnson, K., & Smith, L. (2018). The role of clarity in content delivery and its impact on student satisfaction. *Journal of Educational Psychology*, 110(3), 382-396. American Psychological Association.
- Johnson, L., Becker, S. A., Cummins, M., Estrada, V., Freeman, A., & Ludgate, H. (2020). *NMC Horizon Report: 2020 Higher Education Edition*. EDUCAUSE.
- Kunter, M., Baumert, J., Blum, W., Klusmann, U., Krauss, S., Neubrand, M., ... & Jordan, A. (2021). Cognitive activation in mathematics instruction and teacher's pedagogical quality: Predicting students' achievement gains. *Journal of Educational Psychology*, 113(1), 114-131. American Psychological Association (APA).
- Lee, S. Y. (2016). Understanding service quality in online shopping: A critical review and meta-analysis. *International Journal of Human-Computer Interaction*, 32(5), 323-335. Taylor & Francis.
- Ruining, D. (2018). Content, technical, and pedagogical knowledge: An exploration of their interplay in teacher education. *Journal of Teacher Education*, 69(2), 165-177. Sage Publications.
- Saris, W. E., & Gallhofer, I. N. (2014). *Design, evaluation, and analysis of questionnaires for survey research*. John Wiley & Sons.
- Sumyadi, M., Novitasari, V., & Yunanto, T. (2020). The impact of the marketing mix and service quality on customer satisfaction and loyalty: A study of mobile banking in

Indonesia. *Journal of Asian Finance, Economics, and Business*, 7(12), 141-149. Korea Distribution Science Association, Seoul, South Korea

- Tomlinson, C. A. (2014). *The differentiated classroom: Responding to the needs of all learners*. ASCD (Association for Supervision and Curriculum Development), Alexandria, Virginia, USA.
- Wang, H., Hall, N. C., & King, R. B. (2021). A longitudinal investigation of teachers' emotional labor, well-being, and perceived student engagement. *Educational Psychology*, 41(10), 1319-1336. Taylor & Francis.
- Wang, Q., Wang, Z., Chen, Q., & Wei, Q. (2021). Understanding the impact of TPACK-based flipped learning on student engagement, satisfaction, and academic achievement: An empirical study in China. *Computers & Education*, 174, 104374. Elsevier.
- World Bank. (2021). Gender equality in education. Retrieved from <https://www.worldbank.org/en/topic/genderequality/overview#1>.