Bulletin of Business and Economics, 13(1), 552-556
https://bbejournal.com
https://doi.org/10.61506/01.00239

Practice of Adaptive Teaching in Improving Students' Learning: An Effective Approach

Iram Shahzadi[1], Dr. Abid Hussain[2], Sadia Ashraf[3]

Abstract
Adaptive teaching is considered fundamental to teaching quality and student learning. It describes teachers' practices of adjusting their instruction to students' diverse needs and levels of understanding. It is becoming increasingly clear that not all students require the same education, and the requirement of personalized education is increasingly in demand. This quantitative study was completed through quasi-experimental research design. Systematic sampling technique was used to select 32 students of first semester (male =16, female=16) as sample of the study from the department of Applied Psychology Bahauddin Zakariya University, Multan. Students' academic performance was measured in the subject of Functional English. Experiential group was taught through adaptive approach of teaching and control group was taught through traditional approach. Pre-test and post-test were performed. Findings of the study reveal that there was significant mean score difference of academic performance among students of experiential group with respect to pre-test and post-test. Furthermore, there was also found a statistically significant mean score difference on academic performance between experimental group and control group. It is recommended that at university level adaptive of teaching of teaching should be practiced to improve students' learning.
Keywords: Adaptive teaching, students' learning

1. Introduction

Adaptive teaching is considered fundamental to teaching quality and student learning. It describes teachers' practices of adjusting their instruction to students' diverse needs and levels of understanding (Hardy et al., 2022). Adaptive teaching has been repeatedly claimed pivotal to effective classroom instruction and student learning. In adaptive teaching, teachers employ prompts, instructional support, and feedback, taking into account individual differences in increasingly heterogeneous classrooms (Gallagher et al., 2022). Educational contexts typically involve students from a variety of social and linguistic background with differing cognitive, motivational, and self-regulatory resources. Adaptive teaching is considered to be "socially constructed as teachers metacognitively reflect on students' needs before, during, and after instruction". Adaptive teaching thus may be regarded a type of social practice of reflective teachers in classroom settings that enables adaptations to students' individual differences and learning needs (Hardy et al., 2019).

The primary purpose of adaptive teaching is to ensure high-quality teaching that maximizes student outcomes. By recognizing that students have varying levels of readiness, interests, and learning preferences, adaptive teaching seeks to deliver instruction that is responsive and targeted. This approach involves using formative assessment to understand student progress and adapt instructional strategies accordingly. Adaptive teaching also considers the diverse backgrounds, experiences, and abilities of students, making it an inclusive teaching approach (Hardy et al., 2019; Khan & Wali, 2019). The educational system is changing and adopting new teaching strategies that have a completely different stance and approach. Teachers use an adopting teaching strategy in which they teach each student on a distinct level and do not consider everyone. They treat each student differently because they believe that every student is unique. They take each student's needs into account and provide instruction accordingly. Progressive teaching methods, in contrast to traditional education, are dependent on teacher-provided activities, but with adoption methods, students acquire a worldwide level of knowledge (Rasheed, 2018; Darling-Hammond et al., 2020).

2. Literature Review

2.1. Effect of Adaptive Teaching on Students' Learning

Adaptive teaching has been repeatedly claimed pivotal to effective classroom instruction and student learning (Gallagher et al., 2022). In adaptive teaching, teachers employ prompts, instructional support, and feedback, taking into account individual differences in increasingly heterogeneous classrooms (Parsons et al., 2018). The construct of adaptive teaching is regarded a broad category involving teachers' planning, implementation, and reflection of instruction (Hardy et al., 2019). On the level of teacher-student-interactions, adaptive teaching is related to the constructs of scaffolding and contingent support, which aim at detailed descriptions of teachers' tailored support of student learning on the basis of diagnosis and individualized prompts. Effects of adaptive teaching have been found for different instructional environments such as one-to-one tutoring (Wischgoll et al., 2015; Iqbal & Nasir, 2016), small group work (van de Pol et al., 2015; Riaz & Safder, 2016), and classroom instruction, with benefits for students' conceptual understanding in different domains. In line with socio-constructivist theories of learning, teaching may be viewed as the constant negotiation of a teacher's activity within the social context of the classroom. Adaptive teaching takes students' differing ability levels as "opportunities to learn" rather than "obstacles to overcome" (Corno, 2008). It is especially the social context of the classroom that allows teachers to orchestrate learning activities based on individual learning prerequisites for the benefit of all students. Parsons et al. (2018) conjecture that teachers who take individual differences into account and adapt their instruction, also "metacognitively reflect on students' needs before, during, and after instruction" (Parsons et al., 2018). These teachers are experts on their students' learning prerequisites and projected learning trajectories, as they reflect on successful instructional designs. Importantly, these teachers are also able to flexibly adapt to students' individual differences and situational changes within the complexity of a classroom setting. Thus, adaptive teaching is related to both professional competence of teachers, teacher epistemologies and beliefs on instruction, and their flexibly applied didactical knowledge. Accordingly, in a recent study, Brühwiler

[1] Corresponding Author, International Islamic University Islamabad, Pakistan, iram.phdeducation@gmail.com
[2] National Professional Officer Health Department Multan, Pakistan, drabidwho@yahoo.com
[3] School of Sociology, Minhaj University Lahore, Pakistan, ashrafsadia60@gmail.com

and Vogt (2020) found that adaptive teaching competency, conceptualized as planning, diagnosis, didactics, and content knowledge, showed a measurable impact on student learning outcomes. Against this background, Hardy et al. (2019) differentiate between intended and implemented adaptive teaching. Intended adaptive teaching refers to the planning component, where teachers acknowledge student differences in designing instructional environments that fit individual needs and learning prerequisites. Implemented adaptive teaching refers to adaptive instructional episodes in which these planned activities are actually taken up by students, resulting in an alignment of intention and in situ implementation. Adaptive teachers, recognize situations where their plan does not fully apply, try to determine why their planned instruction is not working, and find alternative approaches for these situations by employing adaptive, flexible, and creative competencies (Mahmood & Naz, 2015; Von Esch & Kavanagh, 2018). Adaptive teachers can modify their method of instructing and presenting tasks to meet learners' needs and demands.

2.2. Implementation of Adaptive Teaching in Classroom

On a micro level, adaptive teaching is closely related to the constructs of scaffolding and contingent support as they pursue similar intentions of adaptive teacher moves based on (diagnosed) student understanding. Due to their high situational constraints, teacher actions on a micro level are the ones that are most challenging (Corno, 2008). Hence, it is also the ongoing diagnosis of student understanding during learning activities that is regarded an element of adaptive teaching on a micro level (Brühwiler & Vogt, 2020). In the literature on teacher support in instructional activity, various conceptualizations are concerned with formats of support. For example, Lazonder and Harmsen (2016) distinguish between teacher prompts, heuristics, scaffolds, and explanations, where explanations and scaffolds are regarded as explicit formats, and prompts and heuristics as implicit formats. These formats showed moderate, yet overall unspecific effects on student outcomes. In an extension, Vorholzer and von Aufschnaiter (2019) propose three dimensions of instructional teacher support, differentiating the degree of autonomy, the degree of conceptual information, and the cognitive level, including their interplay. Whereas these conceptualizations are mostly concerned with typologies of teacher action, the literature on scaffolding is concerned with teacher support in close interplay with individual learners' current levels of task understanding. This kind of support has also been labeled contingent support and is considered a main characteristic of scaffolding, along with the transfer of responsibility (fading) and the use of diagnostic strategies (Hermkes et al., 2018). Wood (1978) describe the process of adapting support to students' needs by the Contingent Shift Principle. According to this principle, support is contingent if a teacher increases control, or explicit support, when facing a student's failure on a task and decreases control when witnessing a student's success at a given task. With regard to successful scaffolding episodes, Pea (2018) point to relevant cognitive functions of teacher support. Problematizing aims at a central element of teaching quality, i.e., students' cognitive activation to promote their higher order thinking processes (e.g., by provoking cognitive conflicts or justification of ideas. Structuring aims at reducing complexity of the learning situation by means of focusing, highlighting, or summarizing relevant information (Praetorius et al., 2018).

According to Reiser (2018), structuring and problematizing are complementary mechanisms that may be in tension and thus have to be carefully balanced. Whereas too much structure may prevent students from engaging actively in a task, problems that are too complex might lead to frustration. Similarly, Pea (2018) refers to modeling and focusing as higher-order functions of scaffolding. While focusing is used to channel learners' attention to relevant aspects, modeling is used to familiarize learners with advanced reasoning and solution procedures. Overall, teacher actions of modeling, problematizing, focusing and structuring involve a high degree of support intended to support active task involvement by students. Scaffolding has been shown to be effective for student learning in tutoring situations as well as in small group work. However, scaffolding seems to be scarce in regular classrooms. Adaptive teaching is regarded a pivotal element of successful learning environments in which teachers base their instructional support on individual student learning prerequisites and needs (Gallagher et al., 2022). Like many technological innovations, the implementation of adaptive learning occurs in stages. The South African university is still at the beginning of the implementation process. It is aware of the advantages adaptive learning brings to students, faculties, and organization as well as exploring the ways of how adaptive concepts can be integrated into the curriculum. The Swiss university implements adaptive learning at the course and module level, testing the new teaching practices and policies to facilitate the wide adoption across the faculties. Neither of the universities, similar to many other higher education institutions implementing adaptive learning around the globe today, has achieved the scaled implementation of adaptive learning across courses and faculties yet (Graham, Woodfield, & Harrison, 2013).

2.3. Adaptive Teaching Practices

Some researchers believe that adaptive expertise reveals comparative advantages, especially when accommodating to changes concerning work requirements, environmental complexity, and atypical situations (Croskerry, 2018). Therefore, teachers have a particular need for adaptive expertise, who are constantly confronted with unpredictable and variable situations in their teaching work. Teachers grow to become adaptive teachers depicted by Timperley (2013) as being motivated by a "moral imperative to promote the engagement, learning, and well-being of each of their students" and involved in "ongoing inquiry with the aim of building the knowledge that is the core of professionalism". It is with adaptive expertise that we can gain an insight into what knowledge, skills, and dispositions make teachers immerse themselves in continuous learning via teaching practices to refine their instruction and expertise (Tomlinson & Imbeau, 2023).

Adaptive expertise can be developed through curriculum reforms and adaptive teaching practices. However, scant empirical studies have adopted adaptive expertise as the focal framework to study teachers and their practices (Ardoin et al., 2020). When depicting teachers' practices, scholars tend to utilize the other terms, i.e., teachers' adaptive practices, or adaptive teaching defined by Parsons (2018) as "teacher action that (a) is non-routine, proactive, thoughtful, and improvisational; (b) includes a change in professional knowledge or practice; and (c) is done to meet the needs of a student or an instructional situation". Teachers flexibly adapt their teaching for handling the student diversity and the instantaneous problems based on continually assessing and learning about students as they teach who are capable of noticing and interpreting embedded information in students' responses comprehensively and accurately and supporting students' differentiated needs (Gallagher et al., 2022).

This kind of in-the-moment teaching adaptation conforms to micro-adaptations according to Corno (2008) who also introduces the paired concept, macro-adaptations (changing curriculum and teaching plans for the occurrence of new information). In order to make adaptations, teachers are reflective to assess, monitor, and regulate their teaching practices (Vaughn et al., 2022). There are two main veins for existing studies concerning adaptive teaching, one is to conceptualize a theoretical model and observe classroom adaptive practices, and the other is to explore ways of developing teachers' adaptive teaching practices. The representatives for the first vein are Parsons and his research team who proposed a cycle model of adaptive teaching encompassing student stimulus, teacher reflection and meta-cognition, and teacher action. They have also developed a teaching observation protocol for adaptive literacy instruction (Parsons et al., 2018). As for the second vein, for instance, Beltramo (2017) analyzed the information from co-generative dialogues to design and enact adaptive classroom practices. Schipper et al. (2018) examined the effects of using lesson study on teachers' self-efficacy and adaptive teaching by quasi-experimental mixed methods. However, the influence of adaptive teaching on students' learning was not fully investigated.

2.4. Rationale of the Study

Nowadays students in classrooms have diversity. Diversities mean religion, family background, culture and region of the students in universities. Diversity in the classroom is growing. A challenge to meet the needs of students, it is essential to look for effective teaching approaches. These diverse needs can be fulfilled only by applying the innovative strategies and methods of delivering knowledge by the teachers to students (Taylor, 2022). Adaptive teaching is considered as effective approach of initiative of use of innovative educational activities through students by him at university level (Mavroudi et al., 2018). Teachers must practice adaptive approach of teaching at university level. Adaptive teaching has become increasingly important in research and practice.

2.5. Statement of the Problem

In Pakistan, education system is improving gradually. Students' diversity in universities has become a challenge for teachers. Classroom comprises on diversity of students such as gender family background, age, exposure, and languages. It is impossible to facilitate all sorts of students with personal differences. In education, adaptive approach of teaching is commonly viewed as the effective way of teaching. In the light of this approach every student can improve his or her academic performance at different level of education. At university level students face difficulties in improving their learning outcomes. Adaptive approach of teaching is perceived as an effective way of delivering with the use of innovative approach of teaching in higher education. Therefore, the study is aimed to investigate the effect of adaptive approach of teaching for improving learning outcomes.

2.6. Objectives of the Study

- To check the mean score of pre-test and post-test of experimental group on students' academic performance
- To compare the score of academic performance of the students of experiment group and control group

2.7. Significance of the Study

This study will provide an opportunity to utilize adaptive approach of teaching in higher education. This study will uncover the importance of adaptive teaching at university level to improve academic performance. It will demonstrate an understanding of theory and concepts relevant to the topic of the research and it provides the broader areas of knowledge under consideration. This study will connect the researcher to the existing knowledge through guidance by relevant theory. Practically, this study will direct the educationists that adaptive approach of teaching is one of the effective approach to improve the students' learning. Furthermore, it will be helpful for policy makers and stakeholders in education sector to design curriculum. In addition, this study will provide the directions of effective teaching approaches in education sector. This study will provide a major contribution in teaching approaches especially in Pakistan.

3. Research Methodology

3.1. Research Design

The nature of study was quantitative. Quasi experimental research was used. Pre-test and post-tests were administered for experimental and control groups. Adaptive teaching was taken as independent variable and students' academic performance was taken as dependent variable. The population of the study was comprised on university students. Target population was taken from the department of the applied psychology. Sample was drawn from the first semester. The data was collected from experimental group and control group. This data was collected in to two segments. Fist for pre-testing and second for post-testing. The gathered data was used to find out the differences of students' academic performance in experimental class and controlled class. In line with this, the researcher used independent sample t-test.

4. Results

Table 1: Standard Deviation, t-value and Mean Score of Students' Academic Performance between Pre-testing and Post-testing of experimental group

Variable	Group	N	Mean	Std.Deviation	T	df	p-value
Students' Learning	Pre-test	16	19.3403	5.30934	7.534	30	0.000
	Posttest	16	23.9047	7.64213			

Mean score difference is significant

Table 2: Standard Deviation, t-value and Mean Score of Students' Academic Performance between Experimental Group and Control Group

Variable	Group	N	Mean	Std.Deviation	T	df	p-value
Students' Learning	Experimental	16	37.5342	4.53290	5.610	30	0.000ss
	Control	16	17.3721	3.65342			

Difference of mean score is significant

4.1. Discussion

Adaptive teaching is considered fundamental to teaching quality and student learning. It describes teachers' practices of adjusting their instruction to students' diverse needs and levels of understanding. In adaptive teaching, teachers employ prompts, instructional support, and feedback, taking into account individual differences in increasingly heterogeneous classrooms. Adaptive teaching has been repeatedly claimed pivotal to effective classroom instruction and student learning (Gallagher et al., 2022). In adaptive teaching, teachers employ prompts, instructional support, and feedback, taking into account individual differences in increasingly heterogeneous classrooms (Parsons et al., 2018). Findings of the study reveal that there was significant mean score difference of academic performance among students of experiential group with respect to pre-test and post-test. Findings of the study are line up with previous study where, adaptive teachers, recognize situations where their plan does not fully apply, try to determine why their planned instruction is not working, and find alternative approaches for these situations by employing adaptive, flexible, and creative competencies to improve students' learning (Von Esch & Kavanagh, 2018). Furthermore, there was also found a statistically significant mean score difference on academic performance between experimental group and control group. Teachers flexibly adapt their teaching for handling the student diversity and the instantaneous problems based on continually assessing and learning about students as they teach who are capable of noticing and interpreting embedded information in students' responses comprehensively and accurately and supporting students' differentiated needs (Gallagher et al., 2022).

5. Conclusion

It is becoming increasingly clear that not all students require the same education, and the requirement of personalized education is increasingly in demand. This study reveal that there was significant mean score difference of academic performance among students of experiential group with respect to pre-test and post-test. Furthermore, there was also found a statistically significant mean score difference on academic performance between experimental group and control group. A challenge to meet the needs of students, it is essential to look for effective teaching approaches.

References

Ardoin, N. M., Bowers, A. W., & Gaillard, E. (2020). Environmental education outcomes for conservation: A systematic review. *Biological conservation*, *241*, 108224.

Beltramo, J. L. (2017). Developing adaptive teaching practices through participation in cogenerative dialogues. *Teaching and Teacher Education*, *63*, 326-337.

Brühwiler, C., & Vogt, F. (2020). Adaptive teaching competency. Effects on quality of instruction and learning outcomes. *Journal for educational research online*, *12*(1), 119-142.

Corno, L. Y. N. (2008). On teaching adaptively. *Educational psychologist*, *43*(3), 161-173.

Croskerry, P. (2018). Adaptive expertise in medical decision making. *Medical teacher*, *40*(8), 803-808.

Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied developmental science*, *24*(2), 97-140.

Gallagher, M. A., Parsons, S. A., & Vaughn, M. (2022). Adaptive teaching in mathematics: A review of the literature. *Educational Review*, *74*(2), 298-320.

Graham, C. R., Woodfield, W., & Harrison, J. B. (2013). A framework for institutional adoption and implementation of blended learning in higher education. *The internet and higher education*, *18*, 4-14.

Hardy, I., Decristan, J., & Klieme, E. (2019). Adaptive teaching in research on learning and instruction. *Journal for educational research online*, *11*(2), 169-191.

Hardy, I., Meschede, N., & Mannel, S. (2022, December). Measuring adaptive teaching in classroom discourse: Effects on student learning in elementary science education. In *Frontiers in Education* (Vol. 7, p. 1041316). Frontiers.

Hermkes, R., Mach, H., & Minnameier, G. (2018). Interaction-based coding of scaffolding processes. *Learning and Instruction*, *54*, 147-155.

Iqbal, T., & Nasir, S. (2016). Integrating National Professional Standards with Islamic Teachings: A Path to Educational Excellence in Pakistan. *Journal of Policy Options*, *3*(1), 7-13.

Khan, W. ., & Wali, R. . (2019). Assessing the Impact of a Comprehensive Capacity Building Program on Educational Leadership and Teaching Performance in Public and Private Sectors. *Journal of Business and Economic Options*, *6*(4).

Lazonder, A. W., & Harmsen, R. (2016). Meta-analysis of inquiry-based learning: Effects of guidance. *Review of educational research*, *86*(3), 681-718.

Mahmood, T., & Naz, G. (2015). Teachers' Attitudes and the Communicative Approach in EFL Classrooms: A Study in Pakistan. *Journal of Policy Options*, *2*(2), 47-54.

Mavroudi, A., Giannakos, M., & Krogstie, J. (2018). Supporting adaptive learning pathways through the use of learning analytics: developments, challenges and future opportunities. *Interactive Learning Environments*, *26*(2), 206-220.

Parsons, S. A., Vaughn, M., Scales, R. Q., Gallagher, M. A., Parsons, A. W., Davis, S. G., ... & Allen, M. (2018). Teachers' instructional adaptations: A research synthesis. *Review of Educational Research*, *88*(2), 205-242.

Pea, R. D. (2018). The social and technological dimensions of scaffolding and related theoretical concepts for learning, education, and human activity. In *Scaffolding* (pp. 423-451). Psychology Press.

Praetorius, A. K., Klieme, E., Herbert, B., & Pinger, P. (2018). Generic dimensions of teaching quality: The German framework of three basic dimensions. *ZDM*, *50*, 407-426.

Rasheed, L. (2018). The Role of Social Support and Work Engagement in Enhancing Job Performance among Secondary School Teachers: A Quantitative Study in Lahore District. *Journal of Policy Options*, *5*(4), 81-86.

Reiser, B. J. (2018). Scaffolding complex learning: The mechanisms of structuring and problematizing student work. In *Scaffolding* (pp. 273-304). Psychology Press

Riaz, M., & Safdar, M. (2016). Exploring Teachers' Concerns: Student Enrollment and Absenteeism in Primary Schools of Punjab Province. *Journal of Policy Options*, *3*(1), 1-6.

Schipper, T., Goei, S. L., de Vries, S., & van Veen, K. (2018). Developing teachers' self-efficacy and adaptive teaching behaviour through lesson study. *International Journal of Educational Research*, *88*, 109-120.

Taylor, S. (2022). The psychology of pandemics. *Annual review of clinical psychology*, *18*, 581-609.

Timperley, H. (2013). *Learning to practise: A paper for discussion*. Wellington: Ministry of Education.

Tomlinson, C. A., & Imbeau, M. B. (2023). *Leading and managing a differentiated classroom*. Ascd.

Van de Pol, J., Volman, M., Oort, F., & Beishuizen, J. (2015). The effects of scaffolding in the classroom: support contingency and student independent working time in relation to student achievement, task effort and appreciation of support. *Instructional Science*, *43*, 615-641

Vaughn, M., Parsons, S. A., & Gallagher, M. A. (2022). Challenging scripted curricula with adaptive teaching. *Educational Researcher*, *51*(3), 186-196.

Von Esch, K. S., & Kavanagh, S. S. (2018). Preparing mainstream classroom teachers of English learner students: Grounding practice-based designs for teacher learning in theories of adaptive expertise development. *Journal of Teacher Education*, *69*(3), 239-251.

Vorholzer, A., & von Aufschnaiter, C. (2019). Guidance in inquiry-based instruction–an attempt to disentangle a manifold construct. *International Journal of Science Education*, *41*(11), 1562-1577.

Wischgoll, A., Pauli, C., & Reusser, K. (2015). Scaffolding—How can contingency lead to successful learning when dealing with errors? *ZDM*, *47*(7), 1147-1159.

Wood, G. (1978). The knew-it-all-along effect. *Journal of Experimental Psychology: Human Perception and Performance*, *4*(2), 345.