An Appraisal of Prospective Teachers' Awareness and Practices of Teaching Research Nexus

Fatima Muhammad Qassim[*], Sufiana Malik[†]

Abstract

Teachers are essential in classrooms, providing instruction, assessing learning, and conducting research. The teaching-research nexus (TRN) fosters critical thinking, problem-solving, and knowledge expansion across a range of subjects by emphasizing research-based, research-led, research-oriented, and research-informed learning. To determine teachers' awareness of the several nexus dimensions—research-led learning, research-oriented learning, research-based learning, and research-informed practices—a study was carried out in Pakistan's Islamabad region. In the quantitative study, researchers surveyed prospective teachers in Islamabad's public and private sector teacher training institutions. The study population was split into two groups using a disproportionate sampling strategy. There were 254 teachers enrolled in one-year, four-year, and Master of Education programs out of the total population. The sample included 79 private-sector and 175 public-sector teachers, ensuring a representative sample of future teachers. Data were gathered by adapting a questionnaire, the study found that prospective teachers were unfamiliar with the nexus and its dimensions. They did not develop a relationship between teaching and research, utilizing research findings to support their teaching concepts and update their methods. This suggests a need to train prospective teachers to prepare specific subjects and concepts by integrating relevant research and building a relationship between teaching content and research. This will enable them to implement strategies for their future teaching responsibilities.

Keywords: *teaching, research, nexus, prospective teachers, awareness, practices.*

Introduction

Teachers' responsibilities in the classroom are diverse and include giving instruction, determining how well students are learning, and acting as mentors. They also conduct academic research on organized studies (Boyd, O'Reilly, Bucher, Fisher, & Morton, 2010). New trends and regulations are on the horizon in the field of education. To convey cutting-edge concepts and trends, educators should read the most recent publications in internationally renowned journals (Blas 2022). Obi (2014) examined the relationship between research and teaching for the purpose of raising the bar for higher education. The country changed its economic model from a knowledge economy to one that involved the dissemination

[*]PhD, International Islamic University, Islamabad, Pakistan, Email: fatima.phdedu147@iiu.edu.pk

[†] Professor, Former Dean National University of Modern Languages

of research to the public. Around the world, there is a growing emphasis on the nexus of teaching and research.

Teaching-research are associated when a teacher considers the subject matter, relevant activities to be carried out in the classroom, how students will be involved, and how to meet their needs in terms of learning (Boyd et al., 2010). The "Teaching-Research Nexus" (TRN) is the term used to describe this connection. According to Jyrhämä et al. (2008), the four subjects covered by the Carrick Institute of the Australian Government were as follows:

1) The impact of the connection on learning for students; 2) The variety of situations in disciplinary contexts; 3) The need for a revision to the institutional strategy; and 4) Benefits to student performance across the nation. Conducting research can provide students with new insights and useful information that will enhance their learning. Research-based learning provides a path for teachers' professional growth. The instructor will also try to attend seminars and conferences relevant to professional growth. Teachers who integrate research into their lessons should consider all aspects of teaching and learning before entering the classroom (Clarke, 2022). Instructions based on research: Research and instruction are combined. These are the dimensions of the teaching-research nexus:

Research-based Learning

The concepts and practices of research are incorporated into the learning process through research-based learning (Wang et al., 2023). With this strategy, students actively participate in research tasks such as experimentation, data collection, information analysis, and conclusion drawing (Osman & Rahman, 2022) in accounting, finance, and management sciences. Students who participate in research-based learning acquire critical thinking abilities, problem-solving skills, and deeper comprehension of the subject matter (Lian-Zhen & Zhu, 2022). The emphasis and objective of research-based learning exercises may influence how they are presented (Oganisjana et al., 2017). These tasks may be use-oriented, which means that they have practical applications and are meant to address issues in the actual world. Students might be assigned, for instance, to conduct a market research study to learn about consumer preferences and create marketing plans for a particular product. Research-based learning tasks may sometimes not be application-oriented, meaning that they are intended to advance the knowledge and comprehension of a particular topic without considering immediate practical applications (Trawick, 2019). The task of conducting a literature study on the effects of climate change on biodiversity, for instance, can be given to students. Although this research-based learning exercise might

not have any immediate applications, Gashaw and Dinkayoh (2015) argue that it adds to the corpus of knowledge in the field of environmental science. Likewise, assignments based on research can be content- or practice-focused (Okuyucu 2022). Students can actively engage in the learning process by acquiring critical skills and knowledge through research-based learning. Additionally, it aids students in understanding research ethics, including the protection of human subjects, informed permission, and confidentiality (Lopes and Vetromille-Castro 2023). With the help of this method, which incorporates research ideas into the educational process, pupils are given theoretical knowledge and critical thinking abilities (Sormin et al. 2023).

Research-Led Learning

Another educational strategy that emphasizes incorporating research into the learning process is research-led learning (Essington 2023). The goal of research-led learning is to establish a setting in which students are actively involved in creating new knowledge and understanding. It encourages the idea that learning should involve more than just obtaining knowledge already known; rather, it should contribute to the growth of knowledge through research (Ding, 2022). According to Mani and Zulueta (2020), this strategy involves students collaborating closely with faculty members who are actively engaged in research and function as mentors and guides throughout the learning process. Students who participate in research-led learning can work on cutting-edge projects, collaborate with industry professionals, and add to ongoing scholarly research in their field (Essington, 2023). Lessons in Learning: Harvard Gazette, n.d.). Research-led learning is particularly beneficial in fields such as technology, medicine, and scientific research, where there is a constant demand for innovation and improvement. Importantly, ethics and integrity must serve as guiding principles for research-led and research-based teaching and learning (Sumani and Kurniawan 2022).

Research-Oriented Learning

Research-oriented learning focuses on an individual's contributions to a particular research project or publication (Razem & Pandor, 2023). The student empathy resilience design concept in group counselling instruction states that (2022), this method enables students to actively participate in the research process by performing investigations, analyzing data, and making significant contributions to the overall research project. Larger cohort course programs frequently include research-oriented learning, which enables students to study subjects related to a particular theme or topic. However, compared to other forms

of learning, incorporating research-based learning into undergraduate curricula can be more difficult (Laycock, 2013). This is because research-based learning demands that students actively participate in the process of developing new knowledge and understanding; it goes beyond merely learning material from books or lectures.

Research-oriented learning is beneficial because it enables students to improve their problem-solving skills, cultivate critical thinking, and comprehend their chosen topic of study in greater depth (Halim et al., 2023). Additionally, research-focused instruction aids in the development of students' abilities in data analysis, research methods, and presentation of their findings. Additionally, research-oriented instruction gives students a sense of authority and control over their education (Qatawneh 2023). Students who actively engage in research become producers of knowledge rather than passive consumers of information (Vadivel et al., 2022). Students develop feelings of academic rigor and integrity through research-oriented learning. Students who participate in research-oriented learning are exposed to ethical issues and responsibilities that come with the research (Badmus & Jita, 2023).

Research-informed learning

According to Jiang et al. (2023), research-informed learning is a type of education that incorporates research findings into the teaching and learning processes. With this strategy, teaching strategies, methodologies, and evaluations are informed and shaped by the research data. Students are exposed to current and pertinent knowledge that might enhance their learning experiences by incorporating research findings into their curriculum (Amalina et al., 2023). Additionally, by studying supporting data and hypotheses, research-informed learning enables students to gain a critical grasp of the subject matter (Jailani et al., 2022). This method aids in the development of pupils' analytical and information-critical thinking abilities. Additionally, by exposing students to various perspectives and knowledge sources, research-informed learning aids in the development of a broader perspective on the subject being studied. Additionally, research-informed instruction motivates students to conduct independent research and create original research topics (Indawati et al. 2023). According to Sumangala and Kini (2002), this kind of instruction enables students to research subjects outside the curriculum parameters and stimulates their intellectual curiosity.

Universities promote a close relationship between teaching and research, strengthening the abilities of graduates, building students' research competencies, and offering professional development opportunities to faculty members (TRN) (Plessis-Schneider 2022). In many respects, the

teaching-research nexus is essential. Teachers perform their own research for lesson planning, student involvement in curriculum development, modification of current research methodology, and teaching-learning pedagogies connected to the teaching-research nexus to establish a connection between teaching and research. Through research-based activities, students gain knowledge (Vega 2022).

Participation in departmental research initiatives is motivated by students. Understanding the teaching-research nexus can be achieved in a variety of ways, such as through attending annual conferences where researchers and teachers exchange their expertise and experiences, or by having undergraduate students participate in lectures and presentations in various formats (Gutierrez, 2006). It should be simple for any teacher to communicate the value of the teaching-research nexus, but it nevertheless presents a barrier (Gutierrez, 2011).

The Rationale of the Study

It is challenging to impart bookish knowledge to pupils in the twenty-first century because of their faster pace, more accessibility, and reliance on technology. The demand for teaching and learning has increased because of the students' expanded skills and shifting learning requirements. Because teaching and research are intertwined, and because research constantly updates teaching, this study is essential. The current study is an attempt to address the concerns and difficulties that people encounter throughout the world.

Statement of the Problem

The problem is assessing how well-informed prospective teachers are on the connection between teaching and research. It looked at research-informed, research-led, and research-oriented learning, among other important aspects of the teaching-research nexus.

The objective of the study

The study sought to ascertain how well teachers in public and private sector teacher training institutions understood the teaching-research nexus (TRN). To this end, the following research goals were set forth:

1. Determine how prospective teachers in the public and private sectors differ in their awareness of research-led learning.
2. Examine how prospective teachers perceive research-oriented learning in the public and private domains.
3. Find out how the perspectives of prospective teachers towards research-based education in the public and private domains vary.

4. Find out how different prospective teachers feel about research-informed instruction in the public and private domains.

Hypothesis of the study

H01: There is no significant difference in the perspective teachers' practices regarding the teaching research nexus in the public sector and private sector.

H02: There is no significant difference in prospective teachers' awareness about teaching research-nexus, research-oriented learning, research-based learning research-based learning, research-led learning, and research-informed learning.

Significance of the Study

To promote quicker economic growth, research in higher education institutions was prioritized by the 2009 National Educational Policy. This study aimed to investigate the awareness of the teaching-research nexus among prospective teachers, with a particular emphasis on the teaching-research link. Teachers can learn by doing so if they are actively involved in research initiatives. Prospective teachers should be informed of their subject and the research being conducted by others, as this understanding fosters critical and creative thinking. Teaching Research Nexus (TRN) can assist in fostering professional competence and idea creativity.

Conceptual Framework

The conceptual framework for this study was based on Mick Healey's (2005) theory of the teaching research nexus (TRN).

Figure 1.1 Conceptual Framework

This study's conceptual framework is based on Healey's (2005) theory of the teaching research nexus (TRN). The conceptual framework of this study is based on the following components of TRN: The teaching-research nexus refers to the connection between research and teaching, focusing on efficiency and relevance. Research-led learning involves a curriculum focused on subject matter knowledge, whereas research-oriented learning encourages problem-solving, critical thinking, and inquiry-based activities. Research-based learning focuses on inquiry-based learning in which students actively participate in research activities. Research-informed learning supports teaching by incorporating current research examples and research-based teaching methods. After studying Healey's (2005) work, the abovementioned components were taken as the conceptual framework of the study.

Literature Review

According to Jiang et al. (2023), Research-informed and research-based practices ought to be the cornerstone of teacher education. By reading scholarly research articles and journals on a range of current topics in education, this would help instructors understand the foundations of the teaching profession. Learning how to formulate research questions and build a conceptual framework to assist the research study is the best way to gain knowledge about research procedures. Through the incorporation of multiple methodologies, such as personal research, to build teaching courses, teaching informs research and infuses teaching-learning.

To develop the teaching-research nexus, undergraduate students were asked to take part in research activities. According to Rau and Burke (2010), the research-teaching and research-practice gap contains a mutual connection. Researchers and practitioners require Joint Research (Healey & Jenkins, 2009) as an efficient way of enhancing research involving students in research and inquiry. In addition, Obi (2014) states that teaching is essential in higher education, spreading, and stimulating studies. Zubrick, Reid, & Rossiter (2001) suggested some ways of teaching research. Teaching students' subject-based research enhances their knowledge, preparing them to take help from research, and methods to teach them about conducting research related to their subject.

Despite continuous disagreement, the relationship between research and teaching in higher education has been studied in several studies. Some studies have shown evidence of a negative research-teaching nexus, whereas other studies have found evidence of a positive nexus, or a link that helps both parties. The argumentators of the teaching-research nexus assert that academic incentive structures prioritize research output over good instruction (Murray 2019). Nonetheless, a revolutionary meta-analysis proposed a neutral research-teaching nexus, contending that there was insufficient proof of a link between research and teaching. According to Indawati et al. (2023), research is typically absent from Pakistani classroom instruction, and the application of education research is frequently disregarded. Bankole et al. (2013) investigated various strategies for tying academic staff research into instruction. When creating course materials, educators include their own research as well as up-to-date, relevant knowledge in the classroom. Higher education is changing its focus from teaching to research, according to McKinley, McIntosh, Milligan, and Mikołajewska (2021). To achieve this goal, teacher quality needs to be raised. The benefits of research for students will be informed by teachers. Meanwhile, academicians and policymakers have been paying attention to the interaction between teaching and research, as

explained by Aluko et al. (2016). Students who are actively involved in the research process are better able to identify faults as well as do analysis. Students' participation in research projects will encourage more of them to learn by doing and will push them in the direction of activity-based learning (Jiang et al., 2023).

Research-based learning, where students actively engage in research projects to learn about research methodologies, follows research-oriented research (where the research process is more focused), and research-tutored practice, where the teacher's research findings are discussed with the class. Teachers and students have quite different ideas about nexus teaching and research. Teachers think that the approach to bringing about innovation in the field is through research. Students also think of research as something they may independently investigate to learn more about their job (Halim et al., 2023).

Furthermore, the design of teacher education programs ought to incorporate inquiry-based learning; research activities ought to be a part of the curriculum. Teacher educators try to include the most recent research into their teachings to help their students become more critical thinkers and provide them with a path for research-based learning to address educational difficulties (Darling-Hammond L., 2017). Similarly, Phelps & Spitzer (2015) clarify that gaining knowledge through teaching is a means of thinking critically about your job; aspiring educators cannot grow into experts or pick up every skill instantly. This contemplation suggests enhancing the connection between research and education. Four main approaches to integrating research into education were offered by specialists like Healey (2005): research-led, research-oriented, research-informed, and research-based learning. Healy (2005) said. According to Healey & Jenkins (2009), there is an increase in teaching quality and student-led learning because of the link between teaching and research.

Simultaneously to this, higher education changed the way it is taught. A curriculum that catered to students' requirements for learning was implemented, and research-based, inquiry-based learning was made available. Teachers at universities should also be prepared to meet the demands of the modern world. Graduates should be prepared by their teachers to handle challenging and difficult situations. Furthermore, according to Brew (2010), there are certain elements that both promote and inhibit the correlation between research and teaching. It is simple to incorporate research into university instruction because colleges already do a thorough analysis. Similarly, Allen & Wright (2014) elucidate that a favorable reaction to connecting teaching with research was found in the study on prospective teachers' perceptions of theory and practice. Prospective educators think that knowledge acquired without experience

is useless in real-world situations. Moreover, teacher educators noted that without the practical application of theory, teacher education programs are meaningless. As a result, Hough (2016) claims that pre-service teachers who participate in inquiry-based learning impart more detailed topic knowledge and instruct with greater enthusiasm. They attempt to address students' learning and important issues in their teaching profession by relating their own educational experiences to the pupils.

According to Darling-Hammond A. P. (2019), teacher education institutions prioritize the high caliber of instruction and learning for aspiring teachers. Future educators ought to be experts in their fields, well-prepared pedagogues, and engaged in practice-based research. According to Lubbe (2015), educating students about the research nexus is crucial to developing capable, marketable intellectuals. In a similar vein, research-based curricula in research-led learning greatly empower teachers while providing students with opportunities for both pure and applied research (Healey M. J., 2005). Students can easily follow the teachers' steps and pick up research skills thanks to research-led knowledge (Ferguson-Patrick, Reynolds, & Macqueen, 2018).

A research-led curriculum in the institutions is part of research-led learning. Research should underpin all instructional strategies, including formative exercises that support the creation of knowledge (Blas, 2022). The link between education and research is currently being discussed globally. Students gain from a research-led learning environment because of teachers' aptitude for subject research (Jusoh & Zubaidah, 2012). However, teachers serve as facilitators and do not reveal to students the findings or conclusion of their research, much like in research-oriented learning. Instructors augment the content with additional project ideas and utilize various teaching aids to clarify the principles (Rau & Burke, 2010). According to Boyd et al. (2010), students become more innovative when they learn through research-oriented curricula. Knowledge that is research-oriented is student-oriented, meaning that students take the lead and initiate the lesson. These theoretically taught notions of teaching abilities and talents will stick with you for a long time and improve your learning capacity to a significant degree when you put them into practice (Chen & Yeung, 2015). Like this, learning should be a continuous process in research-based education. In addition to emphasizing practical courses, prospective educators should concentrate on learning through research in professional topics like medicine and dentistry (Nicholls, 2016). Research-based learning benefits students and teachers equally from research (Jusoh & Zubaidah, 2012). In addition to this, research-informed practice connects research with teaching (Wood, 2010). Research informs teaching and courses, and both the process and

the learning material are equally important. Practice that is not grounded in evidence appears to be lacking. Research findings are taken into consideration while reshaping instruction in research-informed practices. As a result, an instructor uses the most recent and pertinent research findings for guidance (Innis et al., 2014; Benseman, 2013). The goal of the teaching-research nexus is to establish a connection between research and instruction to improve student creativity and innovation as well as instructional effectiveness.

Research Methodology

Population & Sample

This study employed a disproportionate sampling strategy. Teachers' training institutions in the public and private sectors made comprised the two portions of the institutions. 545 aspiring teachers enrolled in B.S.Ed., B.Ed., and MA (Education) programs made up the study population. Due to differences in the enrolment rates of prospective teachers, it was not practical to apply a proportionate stratified sample technique. Therefore, this study employed a disproportionate stratified sampling strategy. Of the 545 participants in the study, the researcher chose 254 were prospective teachers from each of the two divisions. The study gathered information from 254 prospective teachers in Islamabad's public and private sectors using a stratified sample technique. To ensure a representative sample of prospective teachers, the sample consisted of 175 public and 79 private-sector teachers.

Research Instrument

The research instrument was modified from one developed by Professor (Mick Healy.,2005). With the author's permission, the researcher made changes to the questionnaire that considered Pakistani culture and the declared objectives of the current study. Thirty prospective teachers were selected for trial testing before the questionnaire was sent out for the final data collection. The items underwent quality control to ensure that they were easily accessible, pertinent, and understandable by respondents (L.R. Gay et al., 2005).

The pilot study's responses were not considered for the final data collection procedure. Experts in the field of education assisted in examining and verifying the questionnaire's content validity. The questionnaire's accuracy is improved by the opinions and views of experts regarding content validity. (Gay et al., 2012).

Cronbach alpha reliability in SPSS was used to determine the questionnaire's reliability (statistical package for social sciences), which was .90. After pilot testing, minor changes were made to the final data

collection. To collect data, the researcher went to each institution in person. The researcher used the dean of social sciences' letter of authorization to visit the institutions for this purpose, and she gave questionnaires to all aspiring instructors. Research-based learning, research-led learning, research-oriented learning, and research-informed practices were the four main research components that were evaluated by the questionnaire. Six teacher education schools in Islamabad, Pakistan—three in the public and three in the private sectors—were used to choose the sample for this study. Following data collection, the reliability was determined by applying Cronbach's alpha reliability technique using a statistical tool (SPSS). The reliability of the instrument was found to be 0.90, a value that is highly relevant to the study.

Table 1

Distribution of Questionnaire Items

Key components of Teaching-research nexus	Items presented in the Questionnaire
Research-led learning	1,2,3
Research-oriented learning	4,5,6,7,8,9,10,11
Research-based learning	12,13,14,15,16,17,18,19,20,21,22
Research-informed learning	23,24,25,26,27,28,29,30,31

Table 2

Item Correlation

Description	RL	RO	RI	RB	Total
Research-led learning	1	.531**	.575**	.579**	.720**
		.000	.000	.000	.000
		254	254	254	254
Research-oriented learning	1	.648**	.576**	.770**	
		.000	.000	.000	
		254	254	254	
Research-informed learning		.679**	.922**		
		.000	.000		
		254	254		
Research-based learning	1	.877**			
		.000			
		254			
N		1			
					254

**. At the 0.01 level, correlation is significant (2-tailed).

Note RL: Research-led learning; RO: Research-oriented learning; RI: Research-informed learning; RB: Research-based learning.

Every variable in the questionnaire has a strong correlation, according to Table 1. Pearson's r correlation was used to examine the questionnaire's item correlation. All sub-scales in the questionnaire show a substantial link with each other.

Data Interpretation and Results

The aim of the research was to ascertain the understanding and use of the teaching-research nexus by prospective teachers at public and private sector teacher educational institutions. Data was gathered through an adapted questionnaire. Using the t-test, standard deviation, and mean score, the data was analyzed using SPSS (Statistical Package for Social Sciences), version 20.

Table 3

Total Number of Respondents

Demographics	Areas	No Prospective Teachers	Percentage
Sectors	Public	175	68.9
	Private	79	31.1
Programs	B.S.Ed.	45	17.7
	B.Ed. 1 year	27	10.6
	B.Ed. 4 Years	40	15.7
	M.A (Education)	100	39.4
	M.Ed.	42	16.5
Semesters	1st	59	23.2
	2nd	85	33.5
	4th	69	27.2
	5th	41	16.1
Gender	Male	13	5.1
	Female	241	94.9
Institutions	NUML	46	18.1
	Federal College of Education	83	32.7
	Govt. College of Elementary teachers	46	18.1
	Foundation university	30	11.8
	Preston University	34	13.4
	Sarhad University	14	5.9

Age	18-25	240	94.8
	26 & above	14	5.5
Experience	0 or no	212	83.5
	1-5	42	16.5
Total		254	100.0

The study surveyed 254 prospective teachers from both the public and private sectors in Islamabad. The majority (68.9%) were from public institutions, while 31.1% were from private ones. Among the students in the sample were those enrolled in B.S.E.D., B.Ed., M.A. (Education), and M.Ed. programs, among others. Females made up 94.9% and men 5.1% of the majority. The six universities that made up the sample were S.U. Campus, Preston University, Foundation University, F.C.E., and G.C.E.T.E. 14 of the students were older than 26, bringing the total age of the students to 18–25. 245, representing both public and private sector organizations in Islamabad, were the total number of responders. Data regarding previous work experience revealed that 42 potential teachers had one to five years of experience, while 212 had none.

Testing of Hypothesis

Objective 1: Determine how prospective teachers in the public and private sectors differ in their awareness of research-led learning.
H01: There is no significant difference in prospective teachers' practices about the teaching-research nexus.

Table 4

Independent t-test for comparing the awareness of prospective teachers about teaching-research nexus in public and private sectors institutions.

Sectors	n	Mean	SD	DF	t	P-value
Public	175	26.29	5.854	252	1.387	.167
Private	79	25.14	6.611			

The teaching-research nexus practices of prospective teachers in the public and private sectors are shown in the table. The p-value is.167, over the significance level of.05. These findings are consistent with the independent sample t-test results. The hypothesis that there are no notable differences in those practices was not rejected, leading to the conclusion that there are no significant differences in the practices of prospective teachers with regard to the teaching-research nexus in higher education institutions in the public and private sectors.

Objective: To determine how prospective teachers in the public and private sectors perceive the teaching-research nexus, research-orient learning, research-based, research-led, and research-informed learning differently.

H02: The perceptions of prospective teachers on the relationship between teaching and research, research-orient learning, research-based, research-led, and research-informed learning in the public and private sectors is not significantly different.

Dimension	Sectors	N	Mean	SD	DF	T	sig
Teaching-Research Nexus	Public	175	111.09	19.932	252	1.106	.270
	Private	79	108.11	19.582			
Research-oriented Learning	Public	175	14.13	3.442	252	1.428	.155
	Private	79	13.47	3.293			
Research-Led Learning	Public	175	11.02	2.528	252	.058	.056
	Private	79	10.32	3.078			
Research-based learning	Public	175	41.48	7.827	252	-. 252	.801
	Private	79	41.73	6.496			
Research-Informed Learning	Public	175	44.46	9.173	252	1.453	.147
	Private	79	42.59	10.053			

The table displays the t-test of teachers' awareness of the teaching-research nexus from both the public and private sector perspectives. The independent sample t-test results indicate that the p-value is .270, which is greater than the significance level of.05. As a result, the hypothesis that there is no significant distinction between prospective teachers' awareness of the teaching-research nexus in institutions of higher education in the public and private sectors is accepted, and it is concluded that there is no visible difference between prospective teachers' awareness of the teaching-research nexus. Although there is a marginally higher level of difference between public and private sector prospective teachers' mean scores of public sectors (M=14. 13, SD=3. 442) than private sector prospective teacher's mean score (M=13. 47, SD=3. 293).

A comparison of the views of prospective teachers in the public and private sectors on education focused on research. The p-value of 0.155 is more significant at the 0.05 levels of significance. Therefore, it is thought that prospective teachers' opinions towards research-oriented

learning in the public and private sectors are essentially the same. It is shown that there is no appreciable variation in the perception of research-oriented learning between prospective teachers in the public and private sectors.

The way prospective teachers in the public and private sector view research-based instruction. At the 0.05 level of significance, the p-value of 0.801 is higher. As a result, it is acknowledged that there are no significant differences in research-based learning at public and private sector institutions among prospective teachers.

The conclusion is that, in terms of research-based learning, there are not significant distinctions between prospective teachers in the public and private sectors. For M=41.48, SD=7.827), use SD=6.496 for M=41.73.

The t-test gauges the understanding of research-led education in the public and private domains among aspiring educators. The statistics show the findings of the independent sample t-test analysis, with a p-value of 0.056 indicating statistical significance. Therefore, there is no evidence to support the study's hypothesis, which states that there is no appreciable difference in prospective teachers' awareness of research-led learning in the public and private sectors. It is shown that there are wide variations in prospective teachers' knowledge of research-led learning. In both public and private contexts, prospective teachers' perceptions of research-based education differ.

Compared to 0.05 levels of significance, the p-value of 0.147 is more significant. Thus, it is believed that there is no significant difference between how prospective teachers assess research-informed practices in the public and private sectors. and the assessment of prospective teachers in the public and private sectors is shown to be very similar. The modest difference in mean scores between prospective instructors in the public and private sectors is evident. The mean score for the public sector (M = 44. 46, SD = 9. 173) and the private sector (M = 42. 59, SD = 10. 053).

Discussion, and Conclusions

The study evaluated the knowledge of 254 teachers in Islamabad regarding research-informed practices at public and private universities, research-led learning, research-oriented learning, and research-based learning.

The study evaluated the knowledge of 254 prospective teachers in Islamabad regarding research-informed practices at public and private universities, research-led learning, research-oriented learning, and research-based learning. Results showed no significant variation in teachers' awareness of these aspects. However, public sector teachers had

higher scores. The study recommends educating teachers in problem-solving and research-based teaching strategies, encouraging independent research projects, and connecting teaching and learning processes to real-life experiences. The study discovered no significant differences in the way prospective teachers at public and private sector universities saw the relationship between research and teaching. Teachers in the public and private sectors generally agreed with the concepts of research-led, research-based, research-oriented, and research-informed learning—all of which involve student involvement in research and use research as the foundation for curriculum and instructional strategies. Based on the data analysis and findings following conclusions have been drawn in line with the research objective:

In the survey of prospective teachers, research-led learning, research-oriented learning, and teaching-research research in the public and private sectors were all assessed as knowledge gaps. The results did not differ significantly. According to Jiang et al. (2023), Research-based teacher education should enhance understanding of teaching principles through scholarly publications and current educational concerns. Studies show a positive research-teaching nexus, while critics argue for a detrimental one due to faculty incentive systems (Murray, 2019), favor research production over teaching excellence. While there is no conclusive proof of a connection between research and teaching, a seminal meta-analysis showed a neutral research-teaching nexus. According to Rau & Burke (2010), there is a relationship between the research-practice gap and the research-teaching nexus. According to Healey and Jenkins (2009), including students in research and inquiry is an effective strategy to improve it. Researchers and practitioners need to collaborate more. Obi (2014) adds that as teaching encourages and fosters research, it is also essential to higher education. Reid, Rossiter, and Zubrick (2001) provided some strategies for teaching research. Teaching students how to conduct subject-based research improves their knowledge, gets them ready to use research as a resource, and teaches them how to do research relating to their subject.

According to the study, prospective teachers in the public sector perceive research-oriented learning somewhat more highly than those in the private sector, which suggests that teachers frequently do not include students in research projects. The study suggests that teacher education should be based on research-informed practices, involving undergraduate students in research activities, and training teachers to meet new-era requirements.

Recommendation

It is recommended that to foster critical thinking abilities and make the connection between classroom instruction and real-world experiences, educators should support their students' research projects and spread the word about the value of research-led, research-oriented, and research-informed instruction.

According to the study, prospective teachers in the public sector perceive learning to be more research-oriented than those in the private sector, which suggests that teachers frequently do not include students in research activities. According to the report, teacher education should be focused on research-informed practices, include undergraduate students in research projects, and prepare instructors to meet modern standards.

Acknowledgement

We really appreciate the participation of the respondents in the study. The study article was extracted from the first author's thesis, which was submitted in to NUML, Islamabad, in 2017 to complete the requirements for an MPhil degree.

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