

Female Teachers' Attitude towards Teaching Science in Afghanistan

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Abstract

In comparison to neighboring countries, learner achievement of Afghanistan has been lower, particularly among girls in science. Consequently, this paper presents a primary study in Afghanistan that looked at female teachers' attitudes toward teaching science at the primary level. The quantitative study examines teachers' attitudes toward science education on several subscales. The participants, according to the findings, have a positive attitude toward science in general because they found it relevant and enjoyable. Furthermore, while they discovered themselves capable of teaching science content, they still face some difficulties and require assistance. Finally, gender stereotypes have been observed to occur during the teaching.

Keywords: Attitude, Science, Primary Education, Teachers.

1. Introduction

Afghanistan had tremendous progress in the education system through national and international endeavors and consequently, since 2001 numerous schools were built and many teachers were hired all over the country; However, the over-focus on enrolment has hindered quality of education and it was often questioned. In other words, Afghanistan's education quality has also suffered from the emphasis placed too heavily on enrollment. The country is presently following the declining trend of many other countries in the region in terms of outcomes for fundamental learning. After overcoming the barrier of access, the capacity of instructors to deliver a relevant and worthwhile learning experience is ultimately what determines the quality of education (Bakhshi, 2020). Until recently, there has been no standardized set of indicators to measure the quality and constraints associated with service delivery and frontline providers' behavior, which have a direct impact on the quality of education system. Therefore, without consistent and accurate information on service quality, it is difficult to assess how service

providers are performing (Molina et al., 2018).

Meanwhile, students' performance and academic achievements, especially those of girls, remains as one of the most concerning issues among various other educational constraints. According to Molina et al. (2018), even though Grade 4 students have been in the system for 4 years, they only display the knowledge of a Grade 1 student. Overall, Afghan students' performance in math is comparable to the average in Sub-Saharan Africa. In particular, Afghan students significantly outperform students in Mozambique but perform worse than students in Kenya. Consequently, they consistently performed below the TIMSS International average. Moreover, as the gender disparities remain high even in educational sectors, girls perform weaker than the boys. According to United Nations Children's Fund (UNICEF, 2021), female learners (grades 2/3) scored significantly lower than the minimum competency level in mathematics in 2016. Gradually, the low quality of education and lack of qualified teachers contributed to the dropout of girls from school (Noori, 2017).

The application of science and technology in the developing countries stimulated economic growth,

improved agriculture, health and the standard of living of people. Furthermore, it has been evident that science education should be strengthened at the earliest level in educational systems starting from early childhood (Samady, 2007) as the science achievement gap starts from early childhood (Adair, 2020). Meanwhile, science education is one of the fundamental issues that have been reestablished in Afghanistan and needs improvement. To improve learning achievements, it is important to update the content of science education constantly, based on the students' environment and needs. Therefore, Ministry of Education made efforts to enhance practical skills of teachers regarding science centers and laboratories in order to develop the quality of teaching science (Hemat, 2015).

More recently, there has been a shift in research towards more authentic and innovative ways of teaching science. However, a teacher's teaching experience influences their techniques and the way they present the knowledge, their perceptions and attitudes have an important impact on the teaching approach they practice inside the classroom (Kamizi & Iksan, 2021).

As a result, the purpose of this study is to assess teachers' perspectives and attitudes regarding teaching science at the primary level in Afghanistan. In other words, the study's intention is to reveal the range of opinions on teaching science among teachers at the primary level. Understanding teachers' perceptions and attitudes in this regard may provide an opportunity for reconsidering the teacher education programs and enhancing the approaches used to teach science, as well as, to a lesser extent, improvements in the country's education system.

2. Background

There are more and more STEM (science, technology, engineering, and mathematics) interventions in the educational system, and the debate over their efficacy and the best ways to assess them is becoming a more popular topic. Meanwhile, to deal with difficult complicated issues, the next generation will need skills in STEM, which need to be fostered starting in primary school. According to McDonald et al. (2019), future shortages of STEM-trained professionals are a concern that starts in

elementary school, when many students start to have negative attitudes about science. Later, these young learners are less likely to pursue science issues beyond high school, especially if their negative attitudes regarding science are reinforced. Therefore, the creation of a responsible generation that is knowledgeable and proficient in STEM depends heavily on integrated approaches to teaching and learning and teacher development.

On the other hand, in any educational setting, teachers are in charge of delivering content to students. Understanding teachers' perspectives on their jobs is necessary in order to assess and improve the quality of educational services (van Aalderen-Smeets & Walma van der Molen, 2013). The term attitude refers to external and visible acts related to beliefs. Attitudes are formed via experience and influence what people see, hear, think, and do. Attitudes are made up of circumstantial belief clusters; if these linkages exist, positive beliefs will lead to positive attitudes, which will lead to positive behaviors. Consequently, people's attitudes influence whether they react favorably or negatively to circumstances, people, or events. Similarly, instructors' attitudes impact their behaviors in institutional contexts (Munck, 2007), and associations between teacher attitudes and traits such as confidence levels, self-efficacy beliefs, and varied pedagogical techniques have been discovered (Weinburgh, 2007). Instructors that are keen to try out new and different teaching approaches feel more effective, are more open to new ideas, and are willing to try out new ways to better fulfill the requirements of their students. As a consequence, further links between teacher effectiveness and student outcomes such as success, motivation, and students' efficacy perspectives could be discovered (Silm et al., 2017).

On the contrary, teachers' unfavorable attitudes about science are linked to students' negative attitudes toward science. And these unfavorable attitudes are typically the outcome of negative experiences instructors had while teaching and learning, and they persist during their preservice teacher training (van Aalderen-Smeets et al., 2012; McDonald et al., 2019). Furthermore, these negative ideas tend to have a significant impact on girls' perceptions, especially when teachers reflect prevalent gender stereotypes by expressing unfavorable attitudes about

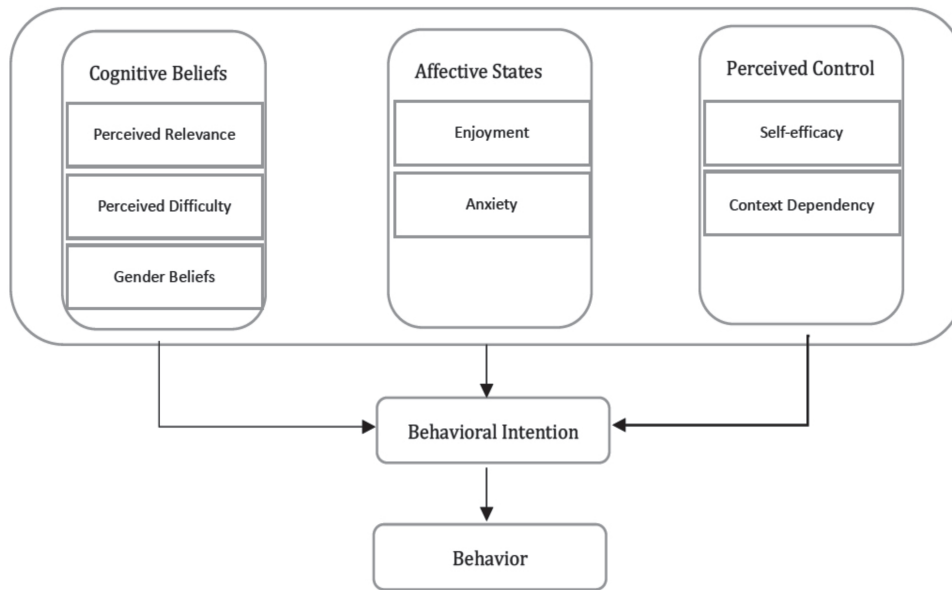


Figure 1. The construct of primary teachers' attitudes toward (the teaching of) science (van Aalderen-Smeets et al., 2012).

mathematics and science to female students. (Navarro et al., 2022). As a result, in order to reach sustainable developments in basic scientific teaching, primary teachers need to develop their own positive attitudes toward science (van Aalderen-Smeets et al., 2012; McDonald et al., 2019).

van Aalderen-Smeets et al. (2012) stated that in their structural model, cognitive beliefs incorporate multiple qualities such as perceived relevance, perceived difficulty, and gender views. Meanwhile, emotional states for scientific instruction are built on pleasure and stress. Self-efficacy and context dependency thus support the notion of perceived control. As a consequence, Figure 1 depicts the conceptual framework of this study's primary teachers' attitudes about teaching science.

3. Methodology

3.1 Participants

Twenty full-time female instructors from Kabul's private schools, who ranged in age from 24-34, were the study's participants. They had a wide variety of teaching experience, from 14 years of education and a minimum of two years teaching to a master's degree and more than 10 years of teaching experience.

3.2 Instrument

The Dimensions of Attitude toward Science (DAS) instrument (van Aalderen-Smeets & Walma van der Molen, 2013), which employed attitude scales to collect data from participants to depict their attitude toward teaching science, served as the study's data source. As indicated in Table 1, the scale has a total of 28 elements over 7 dimensions.

Table 1. The dimensions of attitude towards teaching science

Scale/ Dimension	Description	No. of items	α
Perceived relevance (PE)	Measuring how important and relevant it is for teachers to teach science to primary school students.	5	.916
Gender-stereotypical beliefs (GB)	Measuring the component of science education and its gender-related ideas.	5	.890
Perceived difficulty (PD)	Investigating if primary school teachers believe science in general is more difficult to teach than other subjects.	3	.807
Enjoyment (EN)	Rating teachers' satisfaction with science instruction.	4	.966
Anxiety (AN)	Evaluating the experienced negative impacts related to teaching science.	4	.954
Self-efficacy (SE)	Assessing how well primary school teachers think they can teach science.	4	.857
Context dependency (CD)	Determining the degree to which teachers feel their ability to teach science is influenced by the situation.	3	.914

4. Results

To interpret DAS scores, the frequencies and percentages of the replies for each subscale were determined as presented in Table 2. Likert scales were employed as the measuring scale, where each response was assigned a numerical value (strongly disagree = 1 and strongly agree = 5) (Adair, 2020).

Table 2. Percentage of teacher responses on the DAS by subscale

Responses: Subscales	Positive		Neutral	Negative	
	5	4	3	2	1
Perceived Relevance	48	36	5	3	7
Gender Beliefs*	19	23	20	28	10
Perceived Difficulty*	3.3	33.3	16.7	41.7	5
Enjoyment	55	32.5	2.5	0	10
Anxiety*	5	16.2	10	36.2	32.5
Self-Efficacy	17.5	55	6.2	11.2	10
Context Dependency*	40	38.3	10	1.7	10

Note: For the subscales marked with (*), positive response indicates negative science attitude.

There was a certain degree of agreement among teachers about some topics. As shown in the Figure 2, the majority of teachers (84%) scored favorably on the perceived relevance subscale, showing that the majority of teachers thought science was significant for primary school students.

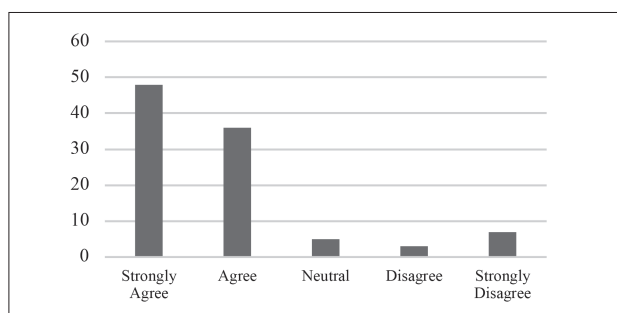


Figure 2. The percentage of respondents who viewed science important and relevant.

Nevertheless, a higher number (87.5%) said they are enthusiastic about and like participating in the science-related activities in class. As shown in Figure 3, the self-efficacy subscale had a similar high score (72.5%), which is categorized as positive and shows that teachers are confident in their capacity to have a sufficient grasp of the science topic to successfully assist primary students with classroom activities.

These findings are also consistent with those of van Aalderen-Smeets et al. (2012) who concluded that the teacher's enjoyment of teaching science increased with how important the subject was to them.

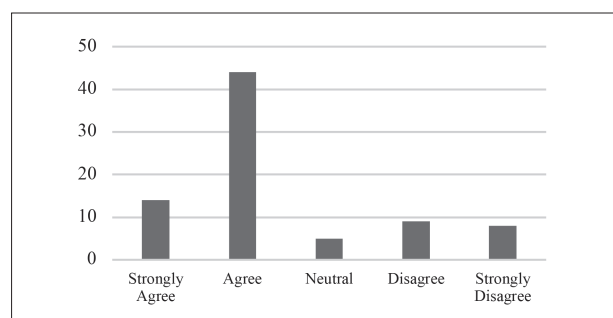


Figure 3. The percentage of teachers who marked themselves confident in teaching science topics.

The results for the gender stereotypes and perceived difficulty subscales, on the other hand, differ among respondents. In terms of gender stereotypes, a larger proportion of instructors (42%) are positive, compared to a smaller proportion (38%) who are negative, and 20% who are neutral. Furthermore, similar variation may be noticed in the difficulty subscale. The majority of people (46.7%) find dealing with scientific subjects straightforward; however, around 37% find teaching science difficult, and the remaining 16.7% are neutral on the subscale.

A lower score reveals a favorable attitude toward anxiety, and context dependency despite the high positive attitude toward relevance, enjoyment, and self-efficacy. Just 21.2% of respondents said they were apprehensive about teaching science, whereas 68.7% (36.2= Disagree, 32.5= Strongly Disagree) said they were not anxious about the scientific-related themes. As presented in Figure 4, only a small percentage (11.7%) of respondents indicated that they do not rely on external factors, such as ready-made resources, when teaching science, and the majority of respondents (78.3%) agreed that science is an area where support is needed to carry out tasks. This conclusion, however, contradicts the findings of van Aalderen-Smeets et al. (2012). They discovered that a positive attitude is defined by a high score on Self-efficacy and a low score on context reliance in their study on assessing primary teachers' attitudes toward teaching science. However, this fundamental need to support classroom activities should not be underestimated, as Adair

(2020) discovered in her study of parents' attitudes toward teaching science that, while they are confident in their ability to do science with their children, they still find science difficult and require additional support.

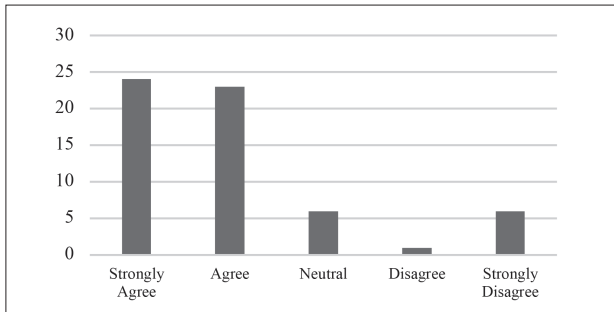


Figure 4. The percentage of teachers who indicated that they rely on external factor while teaching science.

5. Discussion and conclusion

The attitude of female instructors toward teaching science was examined in this study, and some intriguing conclusions were found as a result. The study found that the majority of the participants in this study were teachers who were enthusiastic about teaching science. Despite some anxiety, most of them considered science to be pleasant and necessary for both learners and instructors during the educational process. However, the data show that, while a small number of instructors found it challenging to teach science, a significant percentage of them saw themselves as self-assured scientific practitioners. They did, however, say that they heavily rely on external variables such as peer support and ready-made science resources. Despite some participants' uncertainties, they indicated that gender preconceptions might be encountered accidentally throughout the educational process.

Moreover, further study is required to investigate teachers' interpretations of applying the DAS assessment to a larger and more varied set of instructors. As previously noted, the emphasis on teachers was due to a growing collection of research suggesting that instructors' favorable attitude toward science was crucial to students' scientific enthusiasm and success. Therefore, more study is needed to broaden the evaluation of teachers' attitudes toward science to include pre-service and in-service teachers

from other provinces, particularly those in remote locations. It will assist academics in determining if teachers' views toward science differ in more disadvantaged and isolated sections of the country. Furthermore, such study would assist experts in understanding how the subdimensions of teachers' attitudes may affect professional development programs, since the findings would lead the trend's demands.

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