

Zone of teacher promoted action based on gender in math lesson

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Abstract

This study was conducted to understand the Zone of Promoted Action (ZPA) of teachers in the context of mathematics learning, based on gender. This research is a descriptive exploratory study using a qualitative approach. The data analysis techniques employed in this study include data transcription, data checking, data reduction, data credibility, and conclusion drawing. The subjects of this study are pre-service PPG students who are prospective teachers. The instruments used in this study include questionnaires and observation sheets. Based on the results of the study, it can be concluded that each teacher, regardless of gender background, possesses unique ZPA capabilities characterized by their ability to manage time, guide discussions, and focus students on the material.

Keywords: Gender, Learning mathematics, Zone of promoted action

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Introduction

Various characteristics of mathematics subjects must be understood by both teachers and students. Teachers need to consider the characteristics of their students to facilitate effective learning. Teachers play a crucial role in advancing education by implementing all educational policies and regulations (Retnawati et al., 2017). The diverse conditions of students in the classroom require significant consideration by teachers to determine appropriate stages in the learning process. These stages or actions should not exceed the students' abilities, ensuring they can follow the process (Jauhara et al., 2017). Teachers assist students through a constructivist process. In acquiring new knowledge, students can interact and communicate with individuals who possess a better understanding; these individuals can be teachers or even professional peers (Faizah et al., 2022).

Student learning conditions refer to any aspects or elements relevant to a particular situation. In students' daily lives, these may include material conditions such as technological devices, appropriate furniture, or comfortable places to study, as well as social relationships,



role expectations, rhythms, gender, and personal habits with their histories. (Isak & Posch, 2013) state that each learning object can be determined by a limited number of essential properties, known as critical aspects. Students must be aware of these aspects to understand what will be learned. The pedagogical consequence is that learning must facilitate students' awareness of these important aspects. An optimal learning condition can be achieved if the teacher is able to organize students and teaching facilities and control them in a pleasant atmosphere to achieve educational goals. Differences in the character of each teacher and student tend to provide their variations in the learning process.

The cognitive development of students is a critical factor in the success of the learning process. Consistent with Piaget, Vygotsky elaborates on the theory of cognitive development, particularly emphasizing the sociocultural concept. Vygotsky introduced the concept of the Zone of Proximal Development (ZPD), which can be interpreted as the nearest development area. According to him, the development of a person's abilities can be divided into two levels: the actual development level and the potential development level (Suardipa, 2020). (Danoebroto, 2015) further explains Vygotsky's theory, stating that the lower limit of the ZPD represents the level of expertise a child can achieve independently (actual development). The upper limit, on the other hand, is the level of additional responsibility a child can handle with the assistance of an instructor (potential development level).

Jean Valsiner expanded Vygotsky's theory by introducing the Zone of Promoted Action (ZPA), which examines teacher actions offered to students, and the Zone of Free Movement (ZFM), which explores the area of children's freedom in the learning process (Iffah & Trisanti, 2022). Valsiner (1997) stated that ZPA comprises a series of activities, objects, and areas in an environment where individual actions are exhibited. Conversely, Blanton et al. (2005) argue that the concept of ZPA refers to a series of activities provided by teachers to induce specific actions in students. Therefore, ZPA is defined as a collection of teacher actions (promoted actions) given to students.

Goos (2005) defines the Zone of Promoted Action (ZPA) as a series of activities offered by adults to promote new skills. Teachers implement various procedures during the teaching process; however, they are not always categorized as ZPA. Some teaching methods included in ZPA refer to activities that encourage students to act and behave to acquire new skills. Several possibilities may arise when teachers promote a learning object to students: students may require assistance from teachers or more knowledgeable peers, students may work independently, students may not respond to the teacher's instructions, and teachers may need to ask students to repeat what has been communicated (Lamb et al., 2011). There are several challenges for teachers in teaching mathematics in the classroom. According to Jauhara et al. (2017), ZPA can be accepted (Accepted Promoted Action /A-PA) or rejected (Rejected Promoted Action /R-PA) by students. Additionally, there is a condition known as Pseudo Promoted Action (P-PA), where students appear to accept the teacher's promoted action but do not truly internalize the instructions. This condition is difficult to detect directly during teaching, as students act as if they are receiving the teacher's promoted action without actually following the instructions. Research is needed to identify these student behaviors and the feedback they provide so that teachers can adjust their teaching methods accordingly. Syamsuddin & Utami, (2023) concluded that teachers find it challenging to determine assessment methods and techniques for measuring students' actual mathematical abilities.

Teachers face significant challenges in implementing the current curriculum, particularly in assessing students' mathematical abilities across cognitive, affective, and psychomotor domains. Good interpersonal relationships between teachers and students, as well as among students themselves, are prerequisites for effective classroom management and are essential for an effective teaching and learning process (Pulungan, 2019).

The relationships established in the classroom are influenced by many factors, one of which is the teacher's gender. Rachman & Tjalla (2008) revealed that there are differences in the characteristics of male and female teachers. Male teachers are usually more assertive in delivering lessons, while female teachers tend to use softer words and a warm attitude in their teaching approach. Pulungan (2019) concluded in his research that, in general, the level of classroom management carried out by female teachers is relatively better compared to that of male teachers.

American Psychological Association (APA) (2013) revealed gender refers to culturally shaped attitudes, feelings, and behaviors associated with biological sex. While the dominant approach in psychology for many years considered gender identity to be an individual property, the significant influence of societal structures, cultural expectations, and personal interactions on its development is now recognized. Significant evidence supports the conceptualization of gender identity as influenced by both environmental and biological factors (VandenBos, 2007). Gender differences result from the gendered division of labor and socio-structural practices that support differences in status and power (Al Baqi, 2023) Children often imitate the actions of their school teachers, both male and female. In other words, male students tend to imitate the social behavior of their male teachers, while female students tend to imitate the social behavior of their female teachers.

Male and female teachers in schools have distinct roles, as male teachers are often more involved in work that requires physical strength and act as father figures at school. Meanwhile, female teachers exemplify diligent, careful behavior and how to interact considerately with others. The traditional view that the teaching profession at the preschool level is solely intended for women is outdated, as students benefit from a balanced presence of both male and female figures (Sum & Talu, 2019). That male and female teachers exhibit different psychological developments (Suhaiabah et al., 2022). Women often possess motherly qualities such as gentleness, emotional sensitivity, and a more feminine approach, while men tend to be rougher, firmer, more powerful, and wise. These physical and psychological differences between men and women influence their personalities, particularly when teaching. Based on these gender differences, the author conducted a study to determine the Zone of Promoted Teacher Action based on gender in mathematics learning.

Methods

This research is an exploratory descriptive study using a qualitative approach. The subjects of this study were PPG Pre-Service prospective teachers engaged in Field Experience Practice (PPL). The study was conducted at SMAN 3 Medan from March 2024 to May 2024. The instruments used in this study included questionnaires and observation sheets. The study subjects comprised 84 individuals, including 38 men and 46 women. The questionnaire was employed to collect data related to teachers' ZPA in mathematics learning, consisting of 20

questions designed based on ZPA indicators according to Iffah et al. (2016) namely methods/models/strategies, media or instruments, and topics given. Observation sheets were used to observe teachers' abilities in providing mathematics learning materials to students. The research procedure involved distributing questionnaires and observing the mathematics learning process using research instruments.

The data analysis techniques employed in this study include: (1) Data transcription, which involves transforming research data collected through distributed questionnaires; (2) Data checking, which entails verifying data obtained from observations to ensure it aligns with the research objectives; (3) Data reduction, which involves selecting appropriate data and discarding data that does not meet the research objectives; (4) Data credibility, which is established through the triangulation method by corroborating data obtained from all instruments used to determine its validity. Triangulation at this stage involves multiple researchers, with four researchers participating in data collection and analysis; (5) Drawing conclusions, which involves developing new theories based on the results of the data analysis stages.

Result

The study began with data collection related to teachers' Zone of Promoted Action (ZPA) by distributing questionnaires consisting of 20 statements. The first stage of data analysis involved the transcription of the distributed questionnaire data. The next stage was data checking, which entailed ensuring that all required data had been entered, specifically verifying that all questions in the questionnaire had been answered by the respondents. In the third stage, the data reduction process was carried out by selecting and excluding data from the questionnaire that was not relevant to the analysis, such as the general identity of the respondents. The results of respondents' answers related to ZPA abilities are divided into two categories based on gender, namely male and female.

Based on Table 1, it is evident that the ZPA ability of male teachers excels in 11 indicators: conveying learning objectives, correlating materials, focusing on concepts, applying concepts, submitting opinions, guiding discussions, giving rewards, strengthening passive students, confirming the achievement of learning objectives, guiding the drawing of conclusions, and providing conclusions. In contrast, the ZPA ability of female teachers excels in 9 indicators: providing stimulus, asking questions, checking student readiness, use of media by students, use of media by teachers, encouraging students to answer, building concepts, understanding concepts, and correcting answers.

In the initial activities, female teachers tend to be more proficient in the early stages of learning, where the focus is on building student motivation to start the learning process. In contrast, male teachers excel in each assessment indicator during the final activities. Based on these results, male teachers concentrate more on the stage of concluding the final process of learning. The highest gap is observed in the indicator of media utilization by teachers, where only 7.69% of male teachers agree with this, compared to 30.43% of female teachers.

The fourth stage is data credibility, during which four researchers conducted observations of the learning process for both male and female teachers. The following are the results of these observations related to the ZPA of male and female teachers.

Table 1. Recapitulation of Teachers' ZPA Capabilities Based on Gender

No	Statement Items	Male (Percentage Agree)	Women (Percentage Agree)
1	Provision of stimulus	38.46	63.77
2	Ask a question	30.77	47.83
3	Checking student readiness.	69.23	69.57
4	Delivery of learning objectives	84.62	57.97
5	Use of media by students.	15.38	21.74
6	Utilization of media by teachers	7.69	30.43
7	Correlation of materials	38.46	30.43
8	Focus on the concept	53.85	50.72
9	Encourage students to answer	38.46	49.28
10	Building the concept	23.08	37.68
11	Understanding the concept	61.54	66.67
12	Applying the concept	30.77	26.09
13	Submitting an opinion	46.15	34.78
14	Guiding discussion	61.54	42.03
15	Correcting the answers	23.08	26.09
16	Giving rewards	23.08	20.29
17	Reinforcement to passive students	38.46	33.33
18	Confirmation of goal achievement	30.77	28.99
19	Guiding drawing conclusions	69.23	43.48
20	Giving a conclusion	61.54	47.83

ZPA of male teacher

Based on the observation results, the subject initiated the learning process with an ice-breaking activity by playing a music video and encouraging students to sing along. Following the ice-breaking activity, the teacher explained the learning objectives for the meeting (Figure 1). In this preliminary stage, the teacher's role in actively involving students was not optimal. This is evidenced by the teacher's dominant role in explaining the objectives and providing contextual examples related to the material. The teacher provides students with the opportunity to express their opinions related to the material to be studied (Figure 2). However, in this process, ZPA's ability is not evident because students express their opinions through search results conducted on their mobile phones.

In the core activity stage, the teacher provides students with the opportunity to express their opinions related to the definition of the material being studied, and one student volunteers to share their opinion. The teacher presents a case example and asks a student to solve the problem by providing a solution in front of the class. The student responds by explaining their opinion to their peers. This exemplifies the teacher's ability to engage students actively in the classroom. Subsequently, the teacher assigns students to groups to discuss and complete the given LKPD (Student Worksheets). Each group is actively involved in the discussion. The teacher observes the discussion process of each group and provides guidance to those experiencing difficulties in solving the given problems. The teacher allows one of the groups to present their discussion results in front of the class. However, after this group presents their

answer, the teacher does not permit other groups to challenge or provide alternative answers. Consequently, the inter-group discussion process within the class is not fully realized.



Figure 1. Students express their opinions regarding learning objectives.



Figure 2. Student discussion process accompanied by the teacher

The learning process continued with an individual assignment to solve problems within 20 minutes. After each student submitted their work, the teacher closed the session. However, the reflection process was not conducted properly, as there was no question-and-answer session related to understanding the material covered, nor were there any conclusions drawn or reflections on the achievement of learning objectives. This was due to inadequate time management, which caused the teacher to rush through the closure of the learning process.

ZPA of female teacher

Based on the results of observations on the ZPA abilities of female teachers, the subject initiated the learning process by explaining the learning objectives and asking a student to repeat the objectives to be achieved by the end of the meeting. The subject provided contextual examples related to the material before addressing the core content. At this stage, students were not asked to provide additional examples, which would have encouraged them to think more broadly and relate the material to their everyday lives. During the core activity, the subject gave a brief explanation of the concept being studied and then asked students to discuss in groups to solve the given problems, which were designed to help them conclude the core material of the ongoing lesson.

The subject monitors the discussion and guides groups experiencing difficulties. The subject allows one group to present their discussion results and encourages other groups to respond (Figure 3). Each group member actively expresses their opinions, and other groups also respond. However, the subject is less effective in guiding the discussion due to suboptimal classroom control. The large number of students discussing, combined with the teacher's insufficiently loud voice, results in a less conducive discussion environment.



Figure 3. Students present the results of the discussion in front of the class.

After the discussion was completed, the subject reinforced the material through the use of LKPD (Student Worksheets). Students were given 10 minutes to solve the problems in the LKPD. The teacher then invited one of the students to write the answer on the board (Figure 4). The ZPA's ability in this process was evident and well-executed. The final activity was concluded by guiding students to correctly draw conclusions. In this stage, the subject directed students to summarize the material and write it in their respective notebooks.



Figure 4. Students write down the answers to the problems in the LKPD.

Discussion

Based on Table 1, it is evident that both male and female teachers are proficient in influencing students and managing the classroom during the learning process. In the initial activities, the ZPA abilities of female teachers appear to be superior to those of male teachers. Conversely, male teachers excel in the closing activities. During the core activities of the learning process, both female and male teachers excel in different indicators without highlighting one gender over the other. There is no significant difference between the ZPA abilities of male and female teachers.

The results of the observations indicate that the ZPA abilities of male and female teachers each have unique characteristics. In heterogeneous class conditions (with both male and female

students in the same class), the interaction between male and female teachers also adjusts to class activities. This aligns with the findings of (Werdiningsih & Natsir, 2020), who concluded that both men and women receive equal opportunities and demands for achieving competencies. Boys and girls exhibit different abilities based on their fundamental skills and individual perseverance in learning. Budi et al. (2023) concluded that there is no significant relationship between teacher-gender differences and student interest in learning. This is consistent with the observations, which show that each teacher reinforces different stages, even though the learning process aims for the same objectives. Each teacher has a unique ZPA ability that adapts to the class conditions during the learning process. Iffah & Trisanti (2022) reached a similar conclusion in their research, stating that prospective teachers with PCK (Pedagogical Content Knowledge) skills exhibit ZPA actions in the classroom. Prospective teachers follow the stages of the learning process but employ different methods for delivering the material.

Conclusion

Male and female teachers reinforce different stages, even though the learning process aims for the same goal. Each teacher, with a different gender background, exhibits ZPA abilities characterized by their unique approaches to time management, guiding discussions, and focusing students on the material.

Declarations

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NS: Conceptualization, Methodology, Supervision, Project Administration
IWBR: Writing - Review & Editing, Resources
ES: Investigation, Validation
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