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Positive Psychology in Multicultural Mathematics Education: Perspectives of Prospective Mathematics Education Teachers

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ABSTRACT

This study explores prospective mathematics teachers' perceptions of the importance of positive psychology and cultural diversity in mathematics learning within multicultural classrooms. A qualitative approach with a case study design was employed. The participants were fifteen prospective mathematics teachers from various regions, selected using purposive sampling. Data were collected through semi-structured interviews and open-ended questionnaires and then analyzed using thematic analysis. This study was conducted in April 2025 at the State Islamic University (UIN) Jurai Siwo Lampung. The data were analyzed using thematic analysis as developed by Braun and Clarke (2006). The findings reveal that most prospective teachers are initially aware of positive psychology's role in creating a supportive learning environment, including using praise, encouraging positive emotions, and developing students' potential. In addition, they view cultural diversity as a valuable aspect that can enrich the learning process, although their understanding remains general and is not yet reflected in concrete instructional planning. These findings highlight the need to integrate positive psychology and multicultural education into teacher education curricula to equip future teachers with inclusive and culturally responsive pedagogical competencies. This study also provides a foundation for developing training programs that prepare prospective teachers to manage multicultural classrooms effectively.

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INTRODUCTION

Cultural diversity in education is increasingly gaining attention in the era of globalization. High population mobility has resulted in various cultural backgrounds coexisting in a single classroom, including mathematics learning. Mathematics education is often regarded as a universal discipline, but its delivery and comprehension are heavily influenced by culture (Efianingrum et al., 2022). Cultural diversity is a valuable social asset, but it also holds the potential for conflict if not managed properly(Kamlasi & Kusdarini, 2022). Students who possess knowledge of cultural diversity tend to develop positive attitudes toward social differences (Loke et al., 2023). Multiculturalism refers to the belief in and practice of recognizing the presence of diverse groups within the culture

of an organization or society. Therefore, teachers must manage multicultural classrooms appropriately.

Multicultural mathematics classrooms require teachers to deliver content conceptually and to nurture the psychological well-being of students from diverse cultural backgrounds. Student well-being in mathematics learning which includes positive emotions, engagement, meaning, and a sense of accomplishment is an essential aspect that remains underexplored compared to cognitive achievement (Goldin et al., 2011);(Heyd-Metzuyanim, 2013).

The positive psychology approach, particularly the PERMA model comprising Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment serves as a relevant framework in this context. Its application in mathematics education has the potential to foster learning persistence, build a sense of belonging, and create an emotionally safe learning environment, especially for students from minority cultural groups (Chodkiewicz & Boyle, 2017). However, few studies have explicitly examined how prospective mathematics teachers understand and internalize positive psychology principles in teaching practices responsive to cultural diversity. Therefore, it is important to conduct an in-depth investigation into the readiness of prospective teachers to integrate positive psychology and multicultural approaches in mathematics learning as part of strengthening inclusive and humanistic pedagogical competence.

Indonesia's cultural diversity demands that teachers play a vital role in creating inclusive multicultural learning environments. Teachers must establish a safe and supportive atmosphere, act as facilitators who foster inclusive learning to develop students' attitudes and understanding of diversity, especially cultural differences, integrate multicultural values into the curriculum, and conduct multicultural skills training (Syamsuardi et al., 2024). Classrooms with diverse cultural backgrounds and student experiences require collaborative project-based approaches, utilization of media and technology, and contextual learning strategies (Kuntariati et al., 2024). Pre-service teachers must be prepared to face the challenges of multicultural classrooms.

Pre-service teachers must have pedagogical and content knowledge and an understanding of students' positive psychology. In inclusive and multicultural education today, prospective teachers must develop open perspectives and adaptive attitudes toward student diversity, particularly cultural aspects. (Sarnita & Titi Andaryani, 2023) Teachers are crucial in implementing multicultural curricula and require continuous support to manage classrooms with cultural diversity. (Ebersole et al., 2015) Teaching is a political act that moves toward a transformative perspective that supports culturally responsive teaching and embeds culture into every aspect of daily instruction. (Gay, 2015) Culturally Responsive Pedagogy is a form of multicultural competence it helps students learn more

about their own culture and that of others as part of their personal development, civic engagement, and social transformation.

In Indonesia, classrooms in schools and universities comprise students with diverse cultural backgrounds regarding language, customs, and learning experiences(Indriati et al., 2022). Students often take pride in their culture and may believe their region is superior to others. Some do not yet show appreciation for differences in religious practices, prefer foreign products, undervalue local languages, and are unfamiliar with Indonesia's history(Fuziani et al., 2021). Indonesia's cultural diversity, shaped by distinct groups with unique characteristics, presents challenges such as ethnocentrism viewing other cultures as inferior. Therefore, students must understand the importance of cultural diversity and learn to appreciate it to become teachers who ensure all students grasp learning concepts effectively, regardless of cultural differences.

A student is considered good at mathematics when they have experienced success in learning, excel in competition, and gain recognition from the teacher (Simamora, 2021). The teacher acts as a primary mediator who translates values of tolerance, pluralism, and multiculturalism to students and actively cultivates internalized awareness of tolerance(Hartati, 2017). Teachers must be sensitive to cultural differences and guide students in accepting these differences. They are essential in creating a learning atmosphere where students feel respected in multicultural classrooms (Khairunida et al., 2023);(Ramadhani et al., 2020).

Indonesia is a multicultural country with various cultures. This diversity is reflected in classrooms with students from different cultural backgrounds. Teachers play a significant role in fostering a conducive learning environment to support students' positive psychological development during mathematics learning (Seligman, 2019). Positive psychology is the study of positive experiences, positive institutions, and positive traits. It explores and describes positive values considered important in specific cultures and helps individuals and societies grow toward a better direction. Well-being consists of five main elements: Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment (PERMA). Each element contributes significantly to happiness and meaning in life (Damri, 2023). Positive psychology offers a supportive and enjoyable climate.

METHOD

This study employed a qualitative approach with a case study design to explore the perceptions of prospective mathematics teachers regarding positive psychology and cultural diversity in multicultural mathematics classrooms. The case study design was chosen to gain an in-depth understanding of participants' experiences and perspectives in

authentic teaching contexts. The population of this study consisted of all prospective mathematics teachers enrolled in the Mathematics Education Program at the institution where the research was conducted, who had completed or were currently undertaking teaching practicum in culturally diverse environments. The participants were fifteen prospective mathematics teachers selected through purposive sampling based on their practicum experiences in culturally diverse settings.

This study was conducted during the even semester of the 2024/2025 academic year at the Mathematics Education (Tadris Matematika) Program of the UIN Jurai Siwo Lampung. The data were analyzed using thematic analysis following the six-phase procedure proposed by Braun and Clarke, which includes: (1) familiarization with the data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the final report. This process allowed the researchers to identify key patterns and themes in the participants' responses (Braun & Clarke, 2006).

Data triangulation was carried out by combining the results of interviews and open-ended questionnaires to ensure the credibility and trustworthiness of the findings. In addition, peer debriefing sessions were held among research team members to discuss emerging themes and validate interpretations.

RESULTS AND DISCUSSION

This study explores prospective mathematics teachers' knowledge of students' positive psychology, their perspectives on multicultural classrooms, and the implications for the mathematics learning process. Data were obtained from 15 respondents through semi-structured interviews and open-ended questionnaires, and were then analyzed thematically.

The interview and questionnaire results show that most prospective teachers had a fairly good initial understanding of positive psychology, although not all used technical terms accurately. For example, some associated positive psychology with “building learning motivation,” “giving praise,” and “helping students not give up easily.” Respondent 1 stated, “If students have self-confidence, they will be braver in answering questions, even if they are wrong. I think that is important.” However, only a few were able to mention concrete strategies based on positive psychology theory. This indicates that, although an intuitive understanding has developed, there is still a need to strengthen both the conceptual and practical aspects of positive psychology in teacher education. The questionnaire results also indicate that prospective teachers generally recognize the importance of understanding students’ cultural backgrounds in the learning process. They

acknowledged that students from different cultures tend to exhibit different learning styles, emotional expressions, and interaction patterns.

Respondent 5 commented: “When I observed a school and handed out questions, the class had two predominant cultures, Javanese and Lampung (based on data from the classroom teacher). During the observation, I noticed a student with a loud and firm voice. Upon investigation, it turned out that the student was of Lampung ethnicity. So, I appreciated the student's loud voice.” This view reflects an awareness that culture influences how students respond to learning. Respondents also emphasized the importance of fairness and avoiding generalizations about students’ characteristics. Nevertheless, not all respondents could articulate specific strategies for addressing such diversity. This suggests that their understanding of multiculturalism remains at an introductory level, rather than being integrated into a structured pedagogical approach.

Prospective teachers’ understanding of positive psychology and multicultural classroom learning can influence how they teach in class, both in lesson planning and implementation. The main implication of these findings is the need to integrate positive psychology values into mathematics teaching strategies that are adaptive to multicultural contexts. For instance, teachers should build students’ self-confidence through humanistic and contextual approaches.

Respondent 4 stated: “If the questions are related to things the students are familiar with, such as their culture or daily life, they become more interested.” This highlights the potential of an ethnomathematics approach as a bridge between cultural diversity and the reinforcement of positive psychology. Strategies such as giving affirmations, designing contextual problems, and providing a safe space for expression can enhance students’ motivation and confidence in learning mathematics.

Respondent 6 noted: “I start by identifying students’ characteristics, then design activities that suit them and can boost their motivation. For example, I use word problems based on their cultural context and always appreciate their efforts. Below is the Thematic Analysis Matrix for fifteen respondents based on the interview and open-ended questionnaire results.

Table 1. Thematic Analysis Matrix

No.	Respondent	Important Excerpt/Transcript	Code	Theme	Interpretation
1	R1	I believe students will be more enthusiastic to learn if we frequently give praise and emotional support.	Encouragement, praise, emotional support	Knowledge of positive psychology	Pre-service teacher understands the importance of positive emotions in learning

2	R2	Each student has a different background, I want to adjust my teaching method so they feel appreciated.	Adapting teaching, valuing differences	Views on cultural diversity	The teacher shows an inclusive attitude towards diversity
3	R3	Children from certain ethnic groups sometimes feel inferior; I want them to feel capable.	Boosting confidence, cultural awareness	Implications for learning	Teacher understands the psychological impact of cultural diversity on learning
4	R4	I think the goal of learning is not just good grades, but also personal growth.	Personal growth, meaning of learning	Positive psychology (personal growth)	View that integrates aspects of positive psychology into learning goals
5	R5	Teachers play a role in encouraging students so they no longer feel anxious about learning mathematics.	Encouragement, praise, emotional support	Knowledge of positive psychology	Teacher as a facilitator of positive emotions to build student confidence in learning math
6	R6	Psychological conditions affect students' interest and courage to learn. If students feel anxious or scared, they will struggle to understand lessons.	Emotional impact on comprehension	Knowledge of positive psychology	Link between psychological conditions and academic performance
7	R7	The challenge is making all students feel valued without discrimination. Sometimes differences in communication styles or values lead to miscommunication. Teachers must be sensitive and open-minded.	Teachers' challenges in multicultural classrooms	Implications for learning	Teachers need sensitivity and openness in responding to cultural diversity
8	R8	I see cultural diversity as a richness to be appreciated. Each	Positive view on multiculturalism	Views on cultural diversity	Pre-service teacher views diversity positively and as

		student has a different background that can be a shared learning resource.			a shared learning asset
9	R9	I create inclusive and supportive learning by designing tasks relevant to different backgrounds. I also provide space for students to work in groups so they learn from each other.	Student collaboration in groups	Implications in mathematics learning	Teacher encourages student interaction to build understanding through cooperation and tolerance
10	R10	I see cultural diversity in class as a valuable asset to enrich learning experiences and prepare students to become more open individuals— a medium to build empathy.	Cultural diversity as an educational asset	Views on cultural diversity	Pre-service teacher sees cultural differences as strengths to enrich learning and character building
11	R11	Building personal relationships with students, using an inclusive and representative curriculum, using friendly and simple language, creating a safe and respectful classroom	Comfortable classroom atmosphere respecting diversity	Views on cultural diversity	A positive, personal, and inclusive learning environment helps students feel safe, understood, and motivated in learning math
12	R12	Very important, the role of positive psychology since many students are already afraid of math. A positive approach can help students feel calmer, more confident, and	Emotional approach in math learning	Knowledge of positive psychology	Positive psychology helps reduce anxiety, encourages courage, and fosters safety in learning math

		less afraid of making mistakes.			
13	R13	Create inclusive classes that respect cultural diversity and adjust methods to students' learning styles.	Respect for diversity through flexible materials and methods	Views on cultural diversity	Adapting materials and methods to cultural backgrounds and learning styles helps create fair, inclusive, and effective classrooms
14	R14	Cultural differences affect learning styles, motivation, and achievement. Students who learn with images and diagrams find it easier to understand math.	Cultural differences affect learning styles	Views on cultural diversity	Cultural differences shape learning styles, so visual/contextual approaches need to be tailored to maximize math understanding
15	R15	Understanding culture, creating inclusive classrooms, and adapting teaching for all students.	Pre-service teacher's ability to adapt teaching for diversity	Implications in mathematics learning	Teachers need to understand culture, build inclusive environments, and adjust approaches so all students feel embraced in learning

The discussion in this study is structured according to the three research questions: (1) prospective mathematics teachers' knowledge of students' positive psychology, (2) their perspectives on multicultural classrooms, and (3) the implications of this knowledge and these perspectives for mathematics learning.

1. Prospective teachers' knowledge of students' positive psychology

The analysis shows that most prospective teachers understand the importance of positive psychology in creating a learning environment that supports students' development. Positive psychology is viewed as an effort to build students' confidence, motivation, and resilience in facing challenges in learning mathematics. One respondent noted that *"teachers play a role in encouraging students so that they no longer feel anxious when dealing with mathematics."* This understanding enables prospective teachers to design instruction that focuses on students' strengths, aligning with Seligman's

PERMA model, which emphasizes the importance of positive emotions and supportive social relationships for psychological well-being.

2. Prospective teachers' perspectives on multicultural classrooms

Most respondents expressed positive views toward cultural diversity. They stated that diversity is an asset that enriches learning and helps shape students into open-minded and empathetic individuals. Statements such as “cultural diversity is a richness that should be appreciated” and “a shared learning resource” indicate that prospective teachers are aware that students' cultural backgrounds influence learning and should be considered in instructional design.

However, respondents also acknowledged the potential for miscommunication due to differences in values and communication styles among students, which requires teachers to be sensitive and skilled in managing classroom interactions.

3. Implications for mathematics learning

Prospective teachers’ knowledge and perspectives on positive psychology and cultural diversity influence how they design and implement instruction. They reported using strategies relevant to students' backgrounds, such as developing contextual problems and allowing group work to encourage peer learning. Statements like “I create inclusive and supportive instruction” reflect their efforts to adopt approaches that are sensitive to diversity and support students’ psychological growth.

These practices align with the core dimensions of Culturally Responsive Pedagogy (CRP), particularly the emphasis on recognizing students' cultural backgrounds, building inclusive learning environments, and fostering positive identity development. By designing mathematics instruction that is both psychologically supportive and culturally inclusive, prospective teachers contribute not only to academic success but also to broader social engagement and personal growth among students.

These findings highlight three key dimensions of culturally responsive pedagogy. First, sociocultural awareness is evident in how prospective teachers recognize and value students' diverse cultural backgrounds. Second, cultural scaffolding appears in their efforts to connect mathematical problems with students' real-life contexts. Third, student empowerment and voice are promoted through learning strategies that provide collaborative spaces for students to express their ideas and identities.

CONCLUSION

Prospective mathematics teachers demonstrated an initial awareness of the importance of positive psychology and cultural diversity in teaching. They understood that a learning climate that emotionally supports students, alongside the inclusion of cultural diversity, can enhance the effectiveness of mathematics education. However, the

practical implementation of these aspects remains limited and requires further reinforcement through teacher education programs that are more psychologically and culturally responsive.

This study provides insights into the readiness of mathematics education students to teach in multicultural classrooms. The findings can serve as a foundation for designing teacher education curricula that are more responsive to both cultural diversity and positive psychology. While prospective teachers have demonstrated initial awareness of the importance of positive psychology, they require further training to apply it effectively in multicultural classrooms. Teacher education institutions should integrate training on positive psychology and multicultural education into their curricula. Prospective teachers are expected to enhance their inclusive pedagogical competencies, while future research should evaluate the direct implementation of these approaches in classroom settings(Fitriyah et al., 2024).

Training on global diversity awareness could also serve as a solution for prospective teachers who have not yet developed the skills to manage multicultural classrooms effectively. Curriculum developers are encouraged to embed the principles of positive psychology and multicultural education into teacher training programs, including the development of contextual teaching materials based on local culture. Mathematics teachers should strive to create inclusive learning environments that respect students' cultural diversity through responsive and humanistic approaches. Strategies such as providing positive reinforcement, using contextual problems, and promoting student collaboration can enhance student motivation and engagement in learning.

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