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Exploring Thinking and Speaking Patterns of Pre-service Teachers in Microteaching: A Cognitive-Reflective Perspective

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Abstract: *This study aims to explore patterns of reflective thinking in pre-service teachers' oral communication during microteaching sessions. It employed a qualitative approach with an exploratory case study design. The participants were sixth-semester students of the Mathematics Education Study Program enrolled in a microteaching course. Data were collected through participant observation, semi-structured interviews, and video documentation of teaching practices, and analyzed using thematic analysis. The findings revealed five key patterns: (1) internal selection of main ideas prior to speaking, (2) a tendency to lose the main ideas during elaboration, (3) the significant influence of content mastery on communication structure, (4) limitations in idea development, and (5) irregularities in oral delivery. These patterns suggest that students have not fully engaged in reflective thinking processes when speaking in front of the class. The study concludes that integrating a cognitive-reflective approach into microteaching training is essential to enhance students' ability to manage ideas and construct systematic, meaningful communication. This research contributes to the development of more reflective and idea-focused learning designs for pre-service teacher education.*

Keywords: *Reflective Thinking Patterns; Pedagogical Speaking Patterns; Microteaching; Pre-service Teachers; Thematic Analysis*

Introduction

Teacher education is the backbone of a nation's educational quality, as teachers serve not only as transmitters of knowledge but also as facilitators of students' critical thinking. One key component of teacher education is microteaching—a small-scale teaching practice designed to equip prospective teachers with effective instructional skills (Allen & Ryan, 1969; Kpanja, 2001). Microteaching plays a vital role in developing the pedagogical, cognitive, and oral communication skills of pre-service teachers within a structured and supportive environment (Fernández, 2010).

Research on thinking and speaking patterns during microteaching is essential, as the internal cognitive processes of pre-service teachers are closely linked to how they articulate and convey ideas during instructional communication (F. Amobi, 2005; Bamberger & Schön, 1983; Korthagen, 2010). The cognitive-reflective perspective offers valuable insight into this area by emphasizing the internalization of knowledge and the role of self-reflection in shaping professional competence (Loughran, 2002; Taggart & Wilson, 2005).

Furthermore, examining thinking and speaking within this context is important for identifying both the limitations and potential of student teachers as they prepare for authentic teaching experiences in the future (Zeichner, 1996; Zeichner & Liston, 2013).

Although important, research related to student teachers' thinking and speaking patterns in microteaching is still relatively limited, especially those that examine both simultaneously from a cognitive-reflective perspective. Most studies focus more on the development of technical teaching skills (F. Amobi, 2005; Fernández, 2010) or evaluation of microteaching performance (Saban & Çoklar, 2013). These studies, although useful, lack elaboration on how the process of deep thinking and reflection is manifested in the form of oral communication during teaching. Research such as that conducted by Zeichner & Wray, (2001) emphasizes the importance of reflection, but does not specifically link it to speaking patterns during teaching practice. On the other hand, a study conducted by Kane et al. (2004) on reflective practice in teacher education shows that reflection is often only a retrospective activity, not part of the teaching process itself.

Research on microteaching has shown that this teaching practice is effective in improving teaching skills (Koross, 2016; Remesh, 2013), improving communication strategies (Amobi & Irwin, 2009), and encouraging reflection on teaching practices (Korthagen, 2010). In another study, Farrell (2012) emphasized that critical reflection in microteaching can change the way student teachers view the learning process. The results of Schön (1987) research on reflection-in-action and reflection-on-action reinforce the importance of reflective thinking skills in the context of real practices such as microteaching. However, many of these studies only see reflection as a process that occurs after teaching activities, not as an integral part of thinking and speaking patterns during the process.

Several studies on communication in teacher education show that the speech patterns of prospective teachers greatly determine how students understand the material (Boyd et al., 2011; Walsh, 2006). In microteaching, the use of reflective and explorative language is considered to reflect high-level thinking skills (Alexander, 2008). Research by Trilokekar & Kukar (2011) suggests that prospective teacher students who are able to use open-ended questions, elaboration of ideas, and negotiation of meaning show more mature reflective thinking skills. However, very few studies have linked these speech patterns with reflective thinking patterns simultaneously in the context of microteaching. In addition, the cognitive approach to studying microteaching has also been widely studied, for example through the analysis of pedagogical thinking of prospective teacher students (Feryok & Pryde, 2012; Shulman, 1991). Shulman introduced the concept of pedagogical content knowledge (PCK) which shows the importance of the relationship between understanding the material and teaching strategies. Feryok & Pryde shows that the development of pedagogical thinking in prospective teacher students occurs through teaching experience and reflection. However, research examining how this knowledge is realized in speaking practices during microteaching is still rare. Thus, this study fills the gap, by looking at students' thinking and speaking patterns simultaneously through an integrated cognitive-reflective framework, so that it is more comprehensive in understanding the professional development of student teachers.

Based on the study above, there appears to be a research gap, namely the lack of studies that simultaneously examine the cognitive-reflective thinking patterns and speaking patterns of student teachers in microteaching practices. Most previous studies separate reflection as a post-teaching activity or only focus on technical speaking performance without linking it to the depth of thinking (Farrell, 2012; K. Zeichner & Wray, 2001). In fact, in real practice, thinking and speaking take place simultaneously and influence each other. Therefore, this study is important to be conducted in order to understand how student teachers internalize, reflect, and communicate their understanding during microteaching practices. By understanding this, it is hoped that the development of teacher education programs can be more directed at honing students' reflective-communicative skills from an early age, as expected by (Korthagen, 2010; Loughran, 2002; Schön, 1987).

Based on the background and research gaps that have been described, the purpose of this study is to explore and analyze the thinking and speaking patterns of prospective teacher students in microteaching practices through a cognitive-reflective perspective. Specifically, this study aims to reveal how the reflective thinking patterns of prospective teacher students shape their speaking patterns in teaching, how the two aspects interact with each other, and how this reflects their professional readiness as educators. Thus, the results of this study are expected to provide theoretical contributions to the study of teacher education, as well as practical contributions in designing more effective microteaching training interventions in forming reflective, communicative, and adaptive teachers to the dynamics of real learning.

Methodology

This study uses a qualitative descriptive-explorative approach to understand the thinking patterns and speaking patterns of student teachers in microteaching practices. Data analysis was conducted through thematic analysis according to Braun and Clarke (2006), which allows for systematic identification of meaning patterns in real contexts. The research participants were 30 sixth-semester students of the Mathematics Education Study Program at STKIP *Taman Siswa* Bima who were taking the Microteaching course. The sampling technique was purposive, with the criteria of direct experience in teaching practices. The research was conducted in the campus microteaching room which has been equipped with teaching simulation facilities. Data collection was conducted through direct observation (with the researcher as a passive observer), semi-structured interviews, video documentation, and student reflection notes. The focus of observation included verbal expression, use of teaching language, class responses, and reflective strategies. Interviews and reflections were aimed at exploring the meaning of teaching experiences. Thematic analysis was conducted through six stages: data familiarization, initial coding, theme search, review, naming, and reporting results. Triangulation of sources and methods was applied to increase credibility, and validation of results was carried out through member checking. Research ethics are maintained through informed consent, anonymity, and participant freedom.

Research Design

This study uses a qualitative approach with thematic analysis to explore the complexity of student teachers' thinking and speaking patterns in dynamic microteaching practices based on real experiences. This approach was chosen because of its ability to capture meaning, processes, and interpretations in a natural context (Battiste et al., 2018). Thematic analysis was chosen because it is flexible and not bound by a rigid theoretical framework, allowing for exploration of diverse meanings in the data (Braun & Clarke, 2006; Nowell et al., 2017). Data were collected through observation, interviews, written reflections, and video documentation. The stages of analysis include data familiarization, manual coding, formation of themes such as "spontaneous reflections" and "concept clarification strategies", review of themes, and compilation of thematic narratives with participant quotes to strengthen interpretations. Validation was carried out through data triangulation and member checking (Lincoln & Guba, 1988). The research workflow consists of six stages: (1) instrument planning and recording, (2) data collection, (3) data management and transcription, (4) thematic analysis, (5) validation through triangulation and peer discussion, and (6) preparation of results and recommendations.

Participants

The term participants refer to sixth-semester students of the Mathematics Education Study Program at STKIP Taman Siswa Bima who are taking the Microteaching course. They were selected through purposive sampling because they have direct experience in microteaching practices, so they are considered capable of providing relevant data (Cresswell, 2013; Palinkas et al., 2015). Participant criteria include having taken most of the education courses, having at least one microteaching practice experience, and being willing to participate in interviews and observations. The number of participants was determined based on the principle of data saturation, namely that data collection is stopped when data is considered sufficient (Guest et al., 2006). Participants were given a complete explanation and signed an informed consent voluntarily. Their identities were disguised and kept confidential (Flick, 2018), while the data was stored securely and only accessed by the researcher. This principle guarantees the protection of participants' rights during the research process.

Data Collection

Data collection was conducted through observation, semi-structured interviews, and written reflection documentation to obtain in-depth and authentic data on students' thinking and speaking patterns in microteaching (Creswell, 2012). Participatory observation was conducted during microteaching practices using cognitive-reflective dimension-based guidelines, such as concept clarification, question management, and response to student difficulties (Angrosino, 2007). Semi-structured interviews explored participants' internal experiences with questions such as: "How do you prepare yourself to explain a concept to students?", "What do you think about when students seem confused?", and "How do you respond to unexpected student questions?". Post-session written reflections were also

collected, containing notes on what went well, challenges faced, and lessons learned (Boud et al., 2013). The combination of these three techniques was used to triangulate sources, increasing the credibility and depth of findings (Nowell et al., 2017), so that the research captured not only external actions, but also the reflective thinking of participants.

Data Analysis

In this study, data analysis was conducted using the thematic analysis framework developed by Braun and Clarke (2006). This approach was chosen because it was able to reveal the meaning, patterns, and main themes of qualitative data, especially those derived from interviews, observations, and student reflection notes. The analysis process began with the data familiarization stage, which was reading and repeatedly reviewing all raw data to gain a comprehensive understanding of the content and context of the data. At this stage, the researcher noted the initial ideas that emerged and recognized potential themes related to students' thinking and speaking patterns. Next, initial coding was carried out, namely identifying and labeling (codes) important parts of the data that were relevant to the focus of the study, such as the codes "forgot the main idea", "structure is not coherent", or "ideas do not develop". The third stage was theme search, namely grouping the codes into broader and more meaningful categories, which were then formulated into initial themes. The themes that were successfully identified included internal selection of ideas, loss of focus, influence of material mastery, irregularity of speaking structure, and limited elaboration of ideas. After that, a theme review is carried out to assess whether the theme truly reflects the data as a whole, and to ensure that there is no overlap between themes. Revisions are made if discrepancies are found. The next stage is defining and naming the themes, which is done by describing the essence of each theme in depth and giving it an appropriate name to represent the contents of the findings. The final stage is compiling a report, where the researcher presents a structured narrative of the findings based on the established themes, accompanied by direct quotes from participants as empirical evidence, and linked to theory or previous study results. This framework is logical because it follows a gradual process from raw data to meaningful thematic interpretation, and is practical because it is flexible and can be applied to various forms of complex qualitative data.

Results and Discussion

This study successfully uncovered a number of important findings that provide an in-depth picture of the dynamics of thinking and speaking patterns of student teachers in the context of microteaching learning. These findings not only reflect the internal cognitive processes that occur when students compile and convey information, but also show how reflective ability and mastery of the material affect the quality of oral communication in the classroom. By analyzing thematically the narratives and verbal interactions of students, this study explains in detail how ideas are formed, selected, and conveyed, as well as the obstacles that arise in the process. These findings are important because they can be the basis for developing more effective microteaching learning strategies based on an

understanding of students' cognitive processes. Furthermore, the following description will systematically present several main points that were successfully identified in this study.

Internal Information Selection Before Speaking

The findings show that prospective teacher students in microteaching sessions generally experience the emergence of several choices of information simultaneously in their minds when speaking. However, only one main idea is ultimately chosen to be conveyed verbally. This indicates a fast and complex internal selection process, where students unconsciously weigh which idea is most relevant or easiest to communicate.

Losing Focus on the Main Idea During Delivery

Although the main idea was successfully selected and conveyed at the beginning of the conversation, many students experienced a loss of focus on the main idea during the elaboration process. As a result, the conversation became incomplete, rambled, or even stopped before the message was properly conveyed.

The Role of Mastery of Material in Smooth Communication

The data also shows that students who have mastered the material well, either through reading, practicing, or teaching experience, tend to be able to convey the main idea more fluently, structured, and logically.

Limitations in Idea Development in Speaking

In some cases, students were only able to convey one main idea without any further development. Such delivery does feel short and concise, but also seems stiff and less communicative.

Irregularity and Un-systematicity in Delivery

Some students show unsystematic speech patterns, with unclear flow, repetitive use of language, and loss of narrative structure when teaching. This kind of communication is often ineffective in conveying learning messages to simulation students. This irregularity shows that in addition to mastery of the material, the skill of organizing ideas logically and communicatively is an urgent need in developing the competence of prospective teachers.

Table 1. *Main Findings of Research on Students' Thinking and Speaking Patterns in Microteaching*

No.	Key Findings	Description of Findings	Implications for Microteaching
1	Availability of Main Ideas in the Mind	Students have many pieces of information in mind, but only one main idea is conveyed; internal selection occurs.	Students need training in information selection and prioritization strategies before speaking.
2	Loss of Focus and Forgetting the Main Idea	After delivering the main idea, students tend to forget or lose	Training in main idea management is necessary to maintain focus while speaking.

		direction during further explanation.	
3	Influence of Content Mastery	Students with strong content mastery speak more fluently, clearly, and in a structured manner.	Enhancing content mastery prior to teaching practice is essential for effective communication.
4	Limited Idea Development	Students are only able to convey one main idea without further elaboration; communication feels rigid.	Development of elaboration skills in oral communication is needed.
5	Irregularity in Delivery	Students often speak in an unsystematic, rambling way without a clear structure.	Training in discourse planning and idea organization is crucial in speaking practice.

Table 1 presents five main findings that reflect the dynamics of the thinking and speaking patterns of prospective teacher students during the implementation of microteaching. The first finding shows that students generally have many ideas in their minds, but only one main idea is successfully conveyed verbally. This indicates an internal cognitive selection process that works before the delivery is carried out. The second finding shows a tendency for students to lose focus after conveying the main idea, so that the explanation becomes incomplete or even loses direction. The third finding underlines the important role of mastery of the material on the fluency and clarity of the communication structure; students who have a better grasp of the content are able to speak systematically and confidently. The fourth finding relates to limitations in developing ideas, where students only convey one main idea without expansion, so that communication becomes short but stiff. The fifth finding highlights irregularities in delivery, such as an unsystematic explanation flow and a tendency to speak without a clear structure. Each finding has practical implications for the design of microteaching programs, especially in terms of strengthening reflective thinking skills, compiling oral discourse, and mastery of the material as the main foundation in teaching practice.

Discussion

This study aims to understand the thinking and speaking patterns of student teachers in microteaching sessions, and to identify factors that influence their communication fluency. The results obtained reveal several significant phenomena in the development of effective speaking skills, especially in the context of learning for prospective teachers. The main findings of this study indicate that students often experience internal information selection before speaking, lose focus on the main idea, and have difficulty in developing further ideas. In addition, mastery of the material is proven to be a factor that facilitates communication, while irregularity in delivery indicates obstacles in systematic discourse planning.

The first result that needs to be considered is the internal information selection process that occurs before students convey their ideas. This finding shows that although students have many choices of information in their minds, only one main idea is finally selected and conveyed. This is relevant to the cognitive load theory, which states that this selection process is an effort to reduce the mental burden in communication. The selection process is important because effective communication requires the ability to organize and focus ideas, as stated by Sweller (2011). The development of this selective skill is important for prospective teachers because they must be able to filter relevant information and convey it clearly to students.

Losing focus on the main idea is also an important issue in this study. After students successfully choose the main idea, they often lose focus when delivering it, causing irregularity and confusion in their speech. This finding is in line with the theory of working memory capacity proposed by Baddeley (2003), which states that the human brain is only able to process a certain amount of information simultaneously. In the context of microteaching, students are expected not only to remember information, but also to be able to maintain consistency in delivering messages, something that is often a major challenge in the speaking process. In addition, the results of this study confirm that good mastery of the material facilitates the flow of communication. Students who have a better mastery of the material are able to convey ideas in a more structured and easily understood way. This supports the findings of previous studies which show that mastery of the material greatly supports smooth communication in teaching (Shiffrin & Schneider, 1977). For prospective teachers, mastery of the material not only reduces anxiety in speaking, but also allows them to adjust their explanations according to the needs of their students.

However, the phenomenon of limitations in developing ideas found in this study also needs attention. Students are only able to develop one main idea without expanding it with deeper elaboration. This can result in communication that feels short and stiff, and reduces clarity in delivering messages. In this context, it is important for prospective teachers to be trained not only to convey information, but also to enrich their explanations to be more interactive and informative, in accordance with Levelt (1992) perspective which emphasizes the importance of developing ideas dynamically in speaking.

Irregularity in delivery is also a finding that needs to be observed. Several students showed unsystematic speaking patterns, such as rambling or not well structured. This shows that in addition to mastering the material, the ability to organize ideas logically and systematically is also important. This study is in line with the concept of discourse planning explained by Ujene & Edike (2015), which states that effective communication requires structured internal arrangements before the ideas are conveyed verbally. Therefore, it is important for prospective teacher students to hone their discourse planning skills so that their communication is more focused and systematic.

Overall, the results of this study provide a clear picture of the challenges faced by students in managing their thinking and speaking processes during microteaching sessions. Although students have relevant ideas, they often have difficulty in conveying them

effectively due to cognitive constraints and limitations in mastering the material and developing ideas. These results show that in addition to mastering the material, speaking training that involves organizing ideas systematically and managing focus well is very important in developing the communication skills of prospective teachers. This study reinforces the importance of providing reflective thinking skills and structured speaking skills for prospective teachers so that they are able to convey material clearly and effectively in front of the class.

Conclusion

This study aims to explore the thinking and speaking patterns of pre-service teachers in microteaching sessions, and to identify factors that influence their communication fluency. Based on the results of the study, it can be concluded that students often experience the dynamics of selecting information before speaking, losing focus on the main idea, and having difficulty in developing ideas further. Mastery of the material is proven to be an important factor that supports the smooth delivery of information, while irregularity in delivery reflects obstacles in organizing systematic discourse. This study makes a significant contribution to understanding the cognitive and communication aspects of pre-service teachers during microteaching activities. These findings enhance existing knowledge about the communication challenges faced by pre-service teachers, especially related to managing main ideas, delivery structures, and mastery of the material. By exploring the dynamics of thinking and speaking, this study enriches the understanding of the importance of structured speaking skills and information management in the teaching context. The scientific contribution of this study is the identification of cognitive factors that influence the delivery of main ideas by pre-service teachers and shows the importance of mastery of the material for more effective communication. In addition, this study also opens up space for the development of more comprehensive speaking training methods for prospective teachers, which not only include mastery of the material, but also management of focus and systematic organization of ideas.

Limitations

This study has several major limitations. First, the scope of participants was limited to only one class of sixth-semester students of the Mathematics Education Study Program, so the findings cannot be generalized to a wider population. Second, this study used a qualitative approach, so the findings are contextual and cannot measure causal relationships directly. Third, data collection was carried out in a limited time, which limits understanding of the dynamics of students' thinking and speaking patterns in the long term. Fourth, although data were collected through various methods (observation, interviews, and videos), the student reflections carried out were retrospective, which could be influenced by recall bias.

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Author Contribution

a. Author 1: Conceptualization, Writing - Original Draft, Editing and Visualization;
b. Author 2: Writing - Review & Editing, Formal analysis, and Methodology;
c. Author 3: Validation and Supervision

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Conflict of Interest

The authors declare no conflict of interest

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