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Teacher-Student Interaction in EFL Classrooms through Creative Problem-Solving: An Application of the Initiation-Response-Feedback Model

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Abstract

Effective teaching relies heavily on solid communication and meaningful interaction between teachers and students. These elements create an environment where students are more engaged and motivated, leading to better learning outcomes. One way to enhance this interaction is through Creative Problem-Solving (CPS), which incorporates creativity into the teaching process. CPS encourages students to think imaginatively, collaborate, and apply knowledge dynamically, fostering a more engaging and interactive classroom environment. This study aims to investigate how Creative Problem-Solving (CPS) facilitates teacher-student interaction patterns by applying the Initiation-Response-Feedback (IRF) theory in an EFL classroom at a state university in Indonesia. The study involved 46 pre-service teachers, six males and 40 females, all fifth-semester undergraduate students enrolled in the Curriculum and Material Development course. Data collection methods included deep interviews and classroom observations. The research revealed that pre-service teachers faced challenges with CPS projects, especially those involving telecollaboration. However, they valued the lecturer's guidance and feedback, which played a crucial role in helping them overcome these difficulties and complete the tasks. Thus, to maximize the benefits of CPS, lecturers must provide a clear understanding of CPS principles, as it is a relatively new approach for many pre-service teachers. Additionally, encouraging pre-service teachers to seek guidance and actively engage in collaborative activities can enhance their critical thinking and overall learning experience.

Keywords: Creative problem solving, pre-service teacher, initiation response feedback.

INTRODUCTION

The interaction between teachers and students is crucial for fostering learning motivation, achievement, and overall performance. Effective interaction helps create a balanced classroom atmosphere and strengthens relationships, which is vital for student engagement (Luo et al., 2022). When students feel recognized and supported by their

teachers, they are more likely to actively engage in learning (Havik & Westergård, 2019). Establishing solid and positive relationships through meaningful interactions is essential for creating a harmonious and effective teaching and learning environment. Highlighting the significance of interaction, Loewen and Sato (2018) argued that interaction allows teachers to introduce new language concepts while providing students opportunities to express themselves to peers and teachers. However, in many English as foreign language classrooms, the interaction process tends to be predominantly controlled by teachers (Bremner, 2019; Maeng & Lee, 2015; Tadesse et al., 2023). This teacher-dominated dynamic often leads to unresponsive exchanges, as students are not given sufficient opportunities to develop and practice their language skills. As a result, there is an imbalance in the interaction between teachers and students, which can hinder language learning effectiveness.

Therefore, it is necessary to shift the classroom paradigm from a teacher-centered approach to a student-centered one. This shift allows students to explore knowledge independently and enhance their critical thinking skills. Keiler (2018) emphasized the importance of student-centred learning, arguing that teachers should support students in constructing their knowledge while serving as facilitators and instructional managers rather than mere information providers. To foster better interaction in the classroom, teachers can incorporate creativity and provide feedback into their teaching methods (Kaplan, 2019). One model that concern about this issue is the CPS model.

The Creative Problem-Solving (CPS) model is particularly effective in fostering students' creativity in tackling and resolving challenges. Treffinger and Isaksen (1992) state that the CPS model involves several key stages. The first stage, identifying problems, includes recognizing the problem and examining a broad objective, opportunity, or challenge. This step is crucial for understanding the challenges and determining the main course of action. The next stage, discovering ideas, encourages students to engage in open exploration, generating numerous concepts (fluency in thinking), considering various innovative perspectives (flexibility), and developing unique and creative ideas (originality). Finally, in the finding solutions and taking action stage, students focus on transforming these innovative ideas into viable alternatives and preparing for successful implementation. This includes planning their approach and monitoring their progress in real-time to ensure they stay on track. Together, these stages guide students through understanding challenges, generating ideas, preparing for action, and planning their approach, which is crucial for fostering creativity and practical problem-solving skills.

Accordingly, in examining the interaction between teachers and students in the EFL classroom, the Initiation-Response-Feedback (IRF) framework was appropriate. The IRF model, expanded by Sinclair and Coulthard (1975), organizes classroom discourse into hierarchical ranks, from lesson objectives to individual acts, such as informative, elicitation, and directive acts. This model highlights the cyclical nature of classroom interactions, where the teacher initiates a prompt, the students respond, and the teacher provides feedback (Van et al., 2010). By integrating CPS within the IRF framework, educators can create more dynamic, interactive, and student-centered learning environments that enhance student engagement and support the development of critical thinking and problem-solving skills.

Furthermore, the literature on teacher-student interaction in EFL classrooms has explored various dynamics that influence the effectiveness of language instruction. Alghasab

et al. (2019) examined the role of teachers in supporting collaborative learning during wiki-mediated activities in Kuwaiti high school EFL classes. Their findings suggest that a dialogic approach by teachers fosters greater student-to-student interaction and collaborative writing. In contrast, a more directive approach limits interaction to teacher-student exchanges, leading to individual work rather than collaboration. On the other hand, Li et al. (2019) focused on the impact of multimedia technology on teacher-student interaction patterns in primary EFL classrooms in rural China. The study found that high technology uses often resulted in more teacher-centred interactions, characterized by increased use of display questions and directives, which reduced spontaneous student output. Besides, Vattøy and Gamlem (2020) focused on the quality of teacher-student interactions and feedback in lower-secondary EFL classrooms. Their study, which analyzed 65 video-recorded lessons, revealed mid-level quality of emotional support and high quality of classroom organization but relatively low quality of instructional support. A key finding was the interdependence between the quality of feedback and instructional dialogue, with challenges identified in supporting students' internal feedback and self-regulation. The study highlighted difficulties in engaging students in extended feedback dialogues in the target language (L2), underscoring a central challenge for EFL teachers.

On the other hand, studies on Creative Problem-Solving (CPS) have reported various positive impacts in the EFL context, particularly in enhancing students' creativity and participation. For example, Wang (2019) examined how the CPS model influences the creativity of public high school EFL students in Taiwan, while Liao et al. (2018) explored its effects on primary EFL students in Taipei City. Both studies found that students expressed positive sentiments about the impact of CPS tasks on their creativity. Additionally, Stolz et al. (2020) investigated how the CPS model affects students' learning achievement at the University of the Virgin Islands, revealing that most students responded well to CPS instruction and agreed that it effectively enhanced their academic performance. These studies demonstrate the significant influence of the CPS model on L2/FL learning. In another study, Rustandi (2017) analyzed the reflection of the IRF (Initiation-Response-Feedback) pattern in a speaking class and investigated the dominant sequence among initiation, response, and feedback. The study found that student response was the dominant sequence in the observed IRF pattern in the speaking class. The study recommends that teachers maintain effective classroom interaction by giving students ample opportunities to participate in verbal interactions, particularly in speaking classes, through the consistent application of the IRF pattern.

However, the interconnected areas of teacher-student interaction in the classroom, particularly within the CPS and IRF framework, still need to be explored. Investigating this topic is crucial, as teachers play a substantial role in fostering the creative potential of all students through their philosophical stances, attitudes, teaching methods, and interactions. Given this context, the study proposes the following research question: What are pre-service teachers' perceptions of teacher-student interaction in the university EFL classroom with CPS and IRF pedagogy?

METHOD

This research adopted a case study approach to gain deeper insights into pre-service teachers' perceptions of teacher-student interaction within a classroom utilizing CPS pedagogy. The study involved 46 fifth-semester undergraduate pre-service teachers (6 males and 40 females), aged between 19 and 24, actively participating in a Materials Development class within the English Education Department at a state university in Indonesia. The class was taught using CPS pedagogy, providing a suitable data collection context. The lecturer assigned the pre-service teachers tasks that required them to follow the CPS steps, including designing lessons and posters. The pre-service teachers worked in groups of 4-5, divided based on school levels. There were 11 groups representing various school levels: Junior High School, Senior High School, Islamic Senior High School, Vocational School, and University Level.

Data were collected through multiple methods. First, classroom observations were conducted over six meetings, each lasting 100 minutes, to observe the interactions between the teacher and students within the CPS framework in the EFL class. The second method was an interview. Written interview questions were distributed to the pre-service teachers during the sixth meeting, asking about their perceptions of teacher-student interaction from the first to the sixth meeting. Additionally, four pre-service teachers volunteered to participate in further interview sessions.

After participating in a class with CPS pedagogy, we sought to understand the pre-service teachers' perceptions. The first interview session was conducted as a written interview, where we provided 13 structured questions based on the instrument blueprint. This session lasted 40 minutes, during which I guided the participants as they answered the questions on their phones. The second interview session was a face-to-face meeting, during which we conducted a semi-structured interview to obtain follow-up data from the previous session. Each face-to-face interview lasted about 15 minutes per participant.

Additionally, the researchers analyzed two supporting documents: the pre-service teachers' lesson designs and poster designs. In the understanding the challenge stage of the CPS model, the pre-service teachers were asked to identify critical problems relevant to their school level, with each group free to choose any theme of problems. In the generating ideas stage, they investigated these problems more deeply, examining the context, reasons, and people involved. From this analysis, they developed creative and applicable solutions in the preparing for action stage. Finally, in the planning your approach stage, they were required to implement their solutions in real-life situations, integrating them into learning activities within their lesson designs.

The data was analyzed using the interactive model proposed by Miles et al. (2019). The initial phase involved data condensation, which included selecting, focusing, simplifying, and transforming the data gathered from observations, interviews, and documents. In the second phase, the data was displayed. After simplifying and categorizing the information according to the IRF model, the data was organized based on each step of the CPS process. The results were then presented to identify the pre-service teachers' perceptions of the types and examples of teacher-student interaction at each stage of the creative problem-solving pedagogy. In the third phase, conclusions were drawn and verified. The data obtained from observations were cross-verified with transcriptions of recordings and interview responses.

Consequently, conclusions were derived by interpreting the findings from the researchers' and the pre-service teachers' perspectives.

FINDING AND DISCUSSION

Pre-service teachers' perception of interaction in understanding the challenge

Understanding the challenge is a crucial stage in the CPS process, where pre-service teachers work to frame problems, identify opportunities, and explore ideas to find appropriate issues to address within their lesson designs. The pre-service teachers employed various strategies to identify problems within their target schools that they could creatively solve. However, their approaches to initiating interaction with the lecturer varied.

Some pre-service teachers initiated discussions with the lecturer based on suggestions to identify relevant problems. For instance, one student noted, *"In the process of finding a problem, we were advised by our lecturer to look for a problem that was close to us. After the lecturer's advice, we looked for problems and wanted to focus on a vocational school based on our members' experience, and we think it is less exposed"* (M1, interview). Another student shared, *"We proposed leadership and English skills according to the lecturer's suggestion, which has not been given much attention in vocational schools. Based on the experience of one of our group members"* (M4, interview).

Following the lecturer's guidance, the pre-service teachers identified problems directly related to their experiences. For example, one member from Group 9, who attended a vocational high school, highlighted issues related to leadership skills. They observed that while vocational school graduates often enter the workforce directly, they frequently need more leadership skills, resulting in most becoming workers rather than leaders. Despite the potential for vocational students to become leaders, many chose to work in factories rather than starting their businesses or leading organizations. The group then proposed this leadership problem to the lecturer for further development.

After extensive discussion and consideration, Group 11 and Group 6 identified problems relevant to their target schools. Group 11, designing lessons for Islamic High Schools, focused on human rights issues, particularly bullying. They aimed to raise awareness about behaviours that constitute bullying, as students often do not recognize them. Meanwhile, Group 6 sought to address the issue of cultural understanding in Senior High Schools, noting that many students preferred Western culture over their local culture. Their goal was to encourage a greater appreciation for their cultural heritage. When these groups proposed their topics to the lecturer, they received feedback indicating that their chosen problems needed to be sufficiently specific or closely connected to the target schools. Another noted, *"The lecturer suggested changing it because the cultural context is not specific and still too broad"* (M3, interview).

The lecturer advised revisions, pointing out that the problems needed to be more directly linked to the target schools and should be more specific. The pre-service teachers reflected on this feedback and acknowledged its value. One student stated, *"We are also aware of and question ourselves about what problems we want to raise because they are still too general. The lecturer also gave us good feedback, so it is clearer what we should do after this"* (M1, interview). Another added, *"When the lecturer said that our problem was not specific and less related to Islamic issues, I did not know that it must be related to Islamic issues*

and the curriculum. I just realized that after being told by the lecturer" (M2, interview). The pre-service teachers recognized that their initial problem statements were too broad and needed to be more aligned with the curriculum and target schools. They appreciated the lecturer's constructive feedback, which was grounded in practical considerations and encouraged them to think critically. Like the approach in Vattøy and Gamlem's (2020) study, the lecturer provided feedback at both the task and the process levels, helping students refine their ideas and improve their lesson designs.

The lecturer took steps to help pre-service teachers better understand real-life situations and problems, guiding them to refine their ideas based on their advice while allowing room for group preferences. One pre-service teacher reflected on the lecturer's efforts during the Understanding the Challenge stage, noting, *"The lecturer often asks for students' opinions regarding the problems. Involving students in discussions and asking for their opinions creates an inclusive learning environment. By listening to students' perspectives, lecturers can understand students' understanding of the material and facilitate a more interactive and participatory learning process"* (M3, interview).

From the observations and interviews, it is evident that there was active two-way communication between the lecturer and pre-service teachers. The lecturer encouraged participation and communication by initiating discussions, asking questions, and ensuring that students thoroughly understood the problems they aimed to solve. This approach engaged pre-service teachers more and held them accountable for their project decisions. The lecturer's efforts align with the definition of ideal classroom interaction, which stimulates discussion, encourages language practice, and fosters a sense of responsibility for learning (McCabe & O'Connor, 2013; Jules, 2019).

Pre-service teachers' perception of Interaction in Generating Ideas

Generating ideas is a crucial stage in the CPS process, where pre-service teachers are encouraged to explore deeper data and information related to their identified problems. They brainstormed various concepts, novel perspectives, and unique ideas, eventually narrowing them down to those with the most potential for development. This stage often began after receiving guidance from the lecturer. For example, one pre-service teacher shared, *"At first, we only looked for data from our friends. Then the lecturer said to look for a broader scope in Indonesia—does it only happen in our neighborhood, or is it more widespread? It turns out that it is comprehensive; in Indonesia, there are many cases like that"* (M1, interview). Following the lecturer's advice, Group 9 expanded their data collection beyond their immediate circle to gather more comprehensive information from across Indonesia. Initially, they only gathered data from friends and acquaintances in vocational high schools, but the lecturer encouraged them to consider broader sources to enrich their understanding of the issue.

Similarly, Group 6 used additional data from their members' experiences, noting that the older generation primarily attended cultural festivals and traditions in their hometowns, with the younger generation showing little interest. They also incorporated AI tools like ChatGPT to gather more data on cultural festivals and traditions. As technology advanced, the lecturer encouraged the pre-service teachers to use various tools and resources, allowing them to explore ideas and data more extensively (Batane & Ngwako, 2016). This open-ended

exploration empowered the students to find creative solutions and gather relevant information to support their projects.

The pre-service teachers utilized technology, such as ChatGPT and online discussion forums, to gather additional data and generate ideas about their identified problems (Okulu & Muslu, 2024). The opportunity to explore ideas using technology during the Generating Ideas stage proved crucial, as it fostered positive attitudes and motivation to learn English. Technology also facilitates individualized instruction and promotes student collaboration, which is particularly valuable in larger classrooms. The pre-service teachers expressed positive perceptions of these exploration opportunities. One student noted, *"In my opinion, the opportunities given by the lecturer to explore ideas in class make me more creative and hone my critical thinking. I get to know more things that I did not know before"* (M2, interview). Another shared, *"I responded positively to the exploration opportunities provided by the lecturer. These opportunities provide space to develop my understanding further"* (M3, interview). These exploration opportunities enabled the pre-service teachers to become more creative and critical thinkers, as they were encouraged to delve deeper into new concepts and ideas. Through this process, each group discovered fresh perspectives on their problems and refined their lesson design drafts. The lecturer supported this exploration by providing feedback on their printed drafts, helping them develop their ideas further (Carless & Boud, 2018).

Based on observations, the pre-service teachers demonstrated increased teamwork and cooperation, with a high rate of English language exchange during discussions. They recognized that the exploration opportunities and collaborative activities significantly benefited their learning. These activities align with the emphasis on communication, where interaction between teacher and student enables students to explore ideas, cultivate autonomous learning, and develop critical thinking skills. CPS effectively supports students in learning collaboratively and thinking critically (Carlgren, 2013). The opportunities for idea exploration provided by the lecturer and collaborative activities helped the pre-service teachers better understand the material, express their ideas, and actively participate in the classroom.

The lecturer responded positively to the data gathered by the pre-service teachers, complimenting them on their ability to obtain rich information from both the internet and personal experiences. The pre-service teachers reflected on the lecturer's feedback, which helped them feel more directed and focused in their data exploration process. One student noted, *"We feel more directed and focused because we know what to look for. To make sure, we sometimes clarify with the lecturer again so it is clearer what the teacher means"* (M1, interview). Another added, *"I am happy because our data are correct. Now we know what to do next because we have a specific focus"* (M3, interview). The pre-service teachers' ability to understand and act on the lecturer's suggestions was crucial in guiding their data exploration in the right direction. This highlights the importance of maintaining strong relationships between teachers and students, which is essential for effective instruction in the EFL context (Li, 2022). The pre-service teachers recognized the lecturer's role as vital to their progress, particularly in completing the telecollaboration assignment (Bueno-Alastuey et al., 2018).

Pre-service teachers' Perception of Interaction in Preparing for Action

In the Preparing for Action stage, the lecturer encouraged pre-service teachers to integrate technology into their lesson plans. The pre-service teachers could incorporate various technologies to enhance student activities and support collaborative learning. Their lesson plans included applications such as Microsoft 365, Zoom, Google Meet, WhatsApp, and TikTok. Group 6 consulted with the lecturer during the observation to refine their solutions within their lesson design draft.

With the lecturer's guidance and feedback, the pre-service teachers were able to identify areas that needed improvement. They found this support essential for completing their project. As one student shared, *"The lecturer responded very well to our assignment. The criticism and comments were very constructive for our group. The lecturers provided constructive support that helped us improve our solution"* (M3, interview). Another noted, *"The lecturer gave suggestions that made finding the right solution easier and explored my ability to overcome problems"* (M4, interview). In this stage, the lecturer acted as a guide and facilitator, helping pre-service teachers identify the aspects of their work that required further discussion. At the same time, the decision-making remained with the students. The lecturer consistently encouraged collaborative discussions and active participation. Cultivating solid relationships between teachers and students is crucial for practical instruction in the EFL context, as Li (2022) highlighted. Success in CPS instruction relies on a collaborative effort between the lecturer and pre-service teachers (Csanadi et al., 2020).

The pre-service teachers used the lecturer's feedback to refine and enhance their solutions. From a learning-centered perspective, students actively seek, analyze, and apply feedback to improve the quality of their work and learning techniques (Winstone et al., 2021). This approach aligns with findings from studies by Wang (2019) and Liao et al. (2019), where students expressed positive feelings about how CPS tasks enhanced their engagement and interaction in the English classroom. These practices promoted interaction with teachers and peers, boosted students' confidence in group discussions, and increased their opportunities for creative experiences.

Pre-service teachers' Perception of Interaction in Planning Your Approach

At this stage, the pre-service teachers developed creative solutions within their lesson designs to address the identified problems. To showcase their work, the lecturer organized a lesson design exhibition where the pre-service teachers presented the final results of their designs. During the exhibition, the lecturer visited each group's section, engaging with the pre-service teachers and asking them to explain their final designs.

During the final stage of the CPS task, students exhibited mixed reactions to the feedback provided by the lecturer. Some groups received approval for their final lesson designs, while others were asked to make further revisions, particularly regarding aligning their activities with the school syllabi. The groups whose designs were accepted showed enthusiasm, actively explaining their work and eagerly responding to the lecturer's questions. They appreciated the constructive feedback, having consistently collaborated and aimed for high achievement throughout the project. One student noted, *"The lecturer responded very well to our assignment. The criticism and comments were very constructive for our group"* (M3, interview). At the same time, another mentioned, *"The lecturer gave suggestions that made finding the right solution easier"* (M4, interview).

In contrast, the groups that were asked to make revisions appeared discouraged. After receiving the lecturer's feedback, these students felt exhausted and less motivated to complete the project with the same level of commitment. One student expressed, *"The task is tiring because it is a long step-by-step process, and there are revisions"* (M3, interview). Another reflected, *"I found this assignment very challenging because the assignment was related to an activity that I was doing for the first time and making a plan to carry out a lesson"* (M2, interview). Their responses to the lecturer's inquiries about their final designs and the decision-making process could have been more enthusiastic, and they appeared more passive during discussions. The lecturer's strategy aimed to make learning engaging and enjoyable by setting challenging yet achievable goals (Lightbown & Spada, 2013). However, the revisions requested by the lecturer in the final stage left some pre-service teachers feeling discouraged and fatigued by the task. This reaction is similar to the findings of Vattøy and Gamlem (2020), where task-level feedback from the teacher sometimes led to students passively participating in teacher-student interactions, with discussions becoming superficial and students appearing bored and disheartened by the end of the lesson.

Despite finding the CPS task challenging, the pre-service teachers expressed a strong interest in implementing CPS in their future classrooms. One student shared, *"After I learned about CPS, I intend to implement it with my students when I become a teacher. CPS benefits students when faced with problems and trains their critical thinking"* (M1, interview). Another echoed this sentiment: *"If I become a teacher, I would strongly consider implementing CPS in my classroom... CPS increases the creative and critical thinking of my future students"* (M2, interview). A third student added, *"Yes, if I become a teacher, I intend to implement CPS in the classroom... my students will be able to think critically and solve problems correctly"* (M3, interview). The interview results indicate high interest among pre-service teachers in using CPS in their future teaching practices. This mirrors the findings from Wang's (2019) study, where students expressed high satisfaction with CPS tasks and a willingness to recommend them to others. The pre-service teachers believe CPS offers significant benefits for their future students and teaching careers, making it a valuable tool for fostering critical thinking and problem-solving skills in the classroom.

CONCLUSION

This research investigates pre-service teachers' perceptions of teacher-student interaction within a classroom employing CPS pedagogy, focusing on the Initiation-Response-Feedback (IRF) framework. The findings indicate that while pre-service teachers find CPS projects challenging, particularly those involving telecollaboration, they also recognize the value of the lecturer's guidance and feedback, structured through the IRF framework, in helping them navigate the project effectively. The lecturer's initiation of interaction, the student's responses, and the subsequent feedback provided were essential in directing the pre-service teachers toward completing their projects. The study offers strategies for teachers to enhance teacher-student interaction in classrooms utilizing CPS pedagogy, highlighting the importance of IRF in this context. To improve outcomes and reduce confusion, lecturers must provide a fundamental understanding of CPS, as it is a relatively new approach for many pre-service teachers. Additionally, pre-service teachers should be encouraged to actively seek guidance and engage in collaborative activities to

enhance their critical thinking skills, with the IRF model serving as a foundation for structured interaction and feedback.

Understanding pre-service teachers' perspectives on teacher-student interaction is vital for improving teaching and learning activities. By incorporating these perspectives, lecturers can evaluate which aspects of their instructional approach are compelling and identify classroom improvement areas using creative problem-solving pedagogy supported by the IRF framework. This research contributes on developing more effective learning strategies, adopting suitable tools and technology, and refining teaching methods that better facilitate interaction. However, this study is limited by its focus on a single classroom. Future research should include a broader context with more participants from diverse educational, cultural, and linguistic backgrounds to ensure a more comprehensive and varied understanding. Understanding students' perspectives on teacher-student interaction, mainly through the lens of the IRF framework, is critical for enhancing the teaching and learning process, allowing educators to assess what is working well and to make necessary adjustments to improve classroom interactions.

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