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Exploring Reflective Learning for A Design Thinking Class

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Abstract
This research explores reflective learning as a potential tool to enhance students' learning experience in a Design Thinking class for English Language Education majors. Specifically, the researchers seek (i) to share how reflective learning can be implemented in a Design Thinking class; and (ii) to investigate ways in which the implemented reflective learning have affected students in processing, evaluating and improving their lesson plan design. To do this, this article lays out the class design that the researchers have implemented in their own Design Thinking classroom; this is carefully mapped out to Gibb's reflective cycle to show how the step-by-step design is aligned with reflective teaching practices. Additionally, students' reflective activities, including consultations with the instructor, teaching demo evaluation rubrics, and reflective essays are analyzed using thematic analysis to uncover insights into their learning process and outcomes. The study reveals that the implemented reflective learning steps help students achieve the intended results: (a) successful revision of their lesson plan; and (b) in-depth reflection throughout the whole process that have influenced their professional values and approach as future educators beyond the Design Thinking class.

Keywords: Design Thinking, Reflective learning, Gibb's reflective cycle, Empathetic reflection, Teacher education

1. Introduction

Reflective learning is known as one of the effective tools in education. It is argued that reflective thinking and learning involve linking a sequence of experiences over time, with continuity between these experiences being essential for facilitating learning (Dewey, 1993, as cited in Rodgers, 2002). He suggests that reflection on these experiences allows individuals to make connections between their past actions and outcomes, leading to a deeper understanding of how to approach similar situations in the future. In reflective practices, this emphasis on the role of students' past experiences in shaping future

actions can make the students feel the continuity and relevance of their learning journey (Sellars, 2014). Reflective learning also encourages individuals to critically analyze their decisions and behaviors, enabling them to develop new insights and perspectives (Chung et al., 2021; Kavaliauskienė et al., 2012; Taylor, 2023). Dewey posits that the reflection process enhances learning and promotes personal growth and development. In this case, a teacher may encourage students to reflect on their past writing assignments to identify patterns in their mistakes and successes, leading to improved writing skill (Lee, 2015). Students can enhance their understanding of effective learning techniques by critically analyzing their previous work (Inaayah & Fithriani, 2024; Kartika et al., 2022). Several points in grading rubrics, peer-review forms, or other instruments teachers provide may immediately point out the criteria they need to pay attention to in achieving learning outcomes (Black & Wiliam, 1998; Vercellotti, 2021). Such instrumentations assist these learners in applying critical thinking and problem-solving skills and new techniques attained during reflection to future assignments or projects. Having to do so, they grow into self-directed and automated learners in the future. In other words, the learners actively claim ownership of the educational experience as they cultivate self-awareness in the learning environment and academic goals. Motivation and persistence are the qualities these self-directed learners have to strive for in their studies.

Design Thinking is highly relevant in academic settings, particularly considering continuous technological advancements and the demands of a fast-paced society (Gleason & Cherrez, 2021). Its principles can effectively enhance problem-solving and innovation, making it an essential approach in today's educational landscape. In teacher education, Design Thinking provides future educators with a framework to understand their thinking processes and reasoning (Panke, 2019; Syah, & Nasri, 2023). It emphasizes the significant impact of decision-making in their roles as educators and equips them with the skills necessary for user-centered problem-solving. For example, education students had to design learning plan scenarios for Arts/Craft and General Science and Social Studies for third and fourth grades elementary school students (Högsdal & Grundmeier, 2021). In that matter, these student teachers had to plan learning scenarios with process-oriented competencies in the aimed subject and its learners. In the case of teaching foreign language, there are several key benefits that future educators gain through the implementation of Design Thinking. Design Thinking opens the opportunity for students to be in teachers/educators' perspectives allowing them to have a sense of ownership in their learning process – both as an individual and in a group (Vercellotti, 2021). This student empowerment is important in language learning where confidence and engagement are keys for successful acquisition. Prototyping and testing phases provide opportunities to apply their language skills in real-world, practical application of classroom model, which reinforces their learning and emphasizes the language acquisition relevancy in lesson plan scenarios.

Previous studies have explored the intersection of reflective learning and Design Thinking. For example, ElSayary (2025) found that reflective learning practices can contribute to teachers' Design Thinking mindset. Hong & Choi (2019) similarly show how reflective learning is correlated to students' design-solving performance in a Biomedical Microelectromechanical Systems and Medical Devices course. Other studies have also explored how reflective learning can best be implemented in Design Thinking classrooms (Schoormann, Stadtländer, & Knackstedt, 2023; Bosch, Härkki, & Seitamaa-Hakkarainen, 2025); however, both articles acknowledged that there is still a lack of research in the implementation of reflective learning for Design Thinking, despite the known benefits of combining these two innovative approaches to problem solving. The researchers also found that there are relatively few studies looking at the intersection between Design Thinking and reflective learning in the Indonesian context. As such, this paper will explore the role of reflective learning practice in a Design Thinking class at university level within the Indonesian context and its influence in student learning. The following research questions guided this research exploration:

1. How can reflective learning be implemented in a Design Thinking course for English Language Education students?

2. In what ways can reflective learning help students process, evaluate and improve their own lesson plan?

2. Literature Review

2.1. Design Thinking

One of the core values of 21st century thinking skills for students is creativity (Mishra & Mehta, 2017, Engliana & Ekarina, 2024). However, creativity often requires venturing outside the beaten path, with unclear rewards and open-ended outcomes (Henriksen, Richardson, & Mehta, 2017). As such, a flexible structure is needed to guide creative endeavors. Design Thinking provides the needed framework for this guidance as many have developed structured ways of implementing it. The most widely followed model of implementing Design Thinking is the Oxford model that consists of 5 stages:

1) Empathize

In the first stage, designers are required to understand their users or the people for whom they are solving a problem. Designers may do this through different means such as doing interviews, observations, or surveys; the main goal at this stage is to empathize with users, to be familiar with who they are, what they need and want, as well as their goals.

2) Define

In the second stage, designers are ready to define the problem, or a specific goal that they want to help their users with. To do this, designers must shift through the plethora of information available to them and identify what, why and for whom they are creating a solution. It is important to note that the most difficult task here would be to determine the root cause of the problem because the same problem might be caused by different underlying factors, depending on the specific contexts relevant to the users.

3) Ideate

After a specific problem or goal has been identified, the designers are ready to think of possible solutions for their users. Because Design Thinking specifically emphasizes the value of creativity and finding out-of-the-box solutions, designers are typically encouraged to be free and to take note of all solution ideas at the initial stage of Ideate, which typically involves free brainstorming sessions. Once solution ideas are brainstormed and mapped out carefully, designers are ready to create a prototype.

4) Prototype

After the ideating process, designers can start on creating their prototype(s). A prototype is generally an early and simplified, but testable version of the product or solution that the designer might have conceptualized from the Ideate stage. This does not have to be the finished version of the product or solution, but the designer must have something that they can test out with the goal of finding possible problems with what they have conceptualized.

5) Test

Equipped with a prototype, the designer would then be ready to test their product or solution with a sample of their potential users, or other experts who can give them valuable feedback. By doing testing with a prototype, the designer can find areas of improvement by tapping into the practicalities of their solution, how their users might feel about it and to generally get some real experience from implementing or using their prototype.

Beverland et al. (2015) writes that Design Thinking is an iterative process that relies on hands-on trial and error. The iterative nature of Design Thinking is most apparent in the last testing stage because all forms of feedback that the designer gets would be input for creating an even better prototype for further testing. This means that insights gained through the testing process might reveal problems with the prototype that would then allow the designer to go back to redefining the problem, to ideating new

solutions (or revisiting other ideas already brainstormed before), or to making a better prototype. The designer is free to revisit any of the earlier stages in the process, depending on feedback received from the testing, and this process may be repeated again and again until a satisfactory solution or product is achieved. As such, there is great potential for implementing guided reflective learning to support students through this process.

2.2. Reflective Learning and reflective writing in classroom practices

Reflective writing is seen as a step towards "the creation of a culture of critical reflection" that goes beyond mere consciousness (Wergin, 2003, as cited in Middendorf, 2009). Reflective writing is a necessary tool at all educational levels for professional development, since higher education promotes and highly values skills in critical thinking, problem-solving, decision-making, and self-awareness among students. These abilities are fundamental to performing as professionals in society since they understand the learning process and are self-directed individuals who find solutions and techniques necessary for events or circumstances. In addition, reflective writing is also valued for its benefits in professional development and helping to establish disciplinary practices in the workplace (McCarthy, 2011) and has an important role in the formation of professional identity. According to Boud, Keogh, and Walker (1985), reflective writing allows individuals to express their values, beliefs, and assumptions, which aids in the formation of professional identities.

The reflective cycle offers a versatile instrument for educators and pre-service teachers that serves as a structured guide throughout the learning process in the classroom, promoting reflective and critical thinking among students/participants (Landi & Rigoni, 2024). Gibb's reflective cycle comprises a six-cyclic process with the following descriptions (Gibbs, 1988, as cited in Hashim et al., 2023, p. 240):

1. Description. *What, where, and when? Who did what? What did you do/read/see/hear? In what order did things happen? What were the circumstances? What were you responsible for?*
   The initial step is necessary to provide basic details of a situation, including what happened, where and what thing(s) occurred, who were involved, and what were ones' roles. The questions aid to provide context for the reflection.
2. Feelings. *What was your initial gut reaction, and what does this tell you? Did your feelings change? What were you thinking?*
   This second step aims to guide one's reflection of initial emotional reactions and thoughts. Describing any changes in emotions during specific occasions reveals various experiences and perspectives.
3. Evaluation. *What pleased, interested or was important to you? What made you unhappy? What difficulties were there? who/what was unhelpful? Why? What needs improvement?*
   The evaluation step is beneficial to assess whether the situation is interesting or noteworthy, good or bad, or even challenging.
4. Analysis. *What pleased, interested or was important to you? What made you unhappy? what difficulties were there? who/what was unhelpful? Why? What needs improvement?*
   Examining factors contributing to the outcomes enables us to identify patterns or insights into why things happened. Such identification may lead us to an understanding and make sense of the experiences.
5. Conclusion. *What have you learnt for the future? What else could you have done?*
   The conclusion section summarizes the key lessons learned from the whole experience. The lessons are the starting points to identify future action if similar situations bound to occur.
6. Action Plan. *If a similar situation arose again, what would you do?*
   This final step is to create a sensible and attainable plan if similar situations happen in the future. Specific actions may help to improve outcomes and attain better results.

This cyclic process is important because it helps individuals internalize the roles and responsibilities in their chosen careers. Reflective writing encourages learners to think and evaluate their actions and decisions in both personal and professional settings (Finlay, 2008). The professional settings relate to the context of their roles as students who are responsible for learning processes and outcomes. The role of students is intrinsically linked to their identities in the academic settings in which they are bound. EFL teachers in Indonesia highlights that reflective writing is essential for self-assessment, helping educators improve their competence and professionalism (Fatimah et al., 2024).

Reflecting on critical incidents and stage-by-stage processes, educators can better understand the learners' experiences, take responsibility for their professional learning and development. This reflection helps them identify, describe, and evaluate areas that need improvement, thereby improving their ability to achieve learning goals effectively (Cirocki & Widodo, 2019; Wijaya & Kuswandono, 2018). The identified areas are not necessarily always problematic but may include other potential areas that need attention and enhancement in the future. These characteristics benefit students/learners and educators, including the fact that reflective writing is a valuable educational tool that enhances metacognitive skills, professional identity, communication abilities, and emotional intelligence, preparing students to deal with the complexities of professional life.

2.3. The application of reflective learning & writing to Design Thinking classroom

There are many cases where reflective learning is used in design-thinking-focused classes. Lynch, et al. (2021) reported on a class design that taught entrepreneurship through the design thinking method whereby students were asked to reflect on the design thinking process used in the classroom. Through the reflective task, it was revealed that students view their development of knowledge and skills as the most important part of the class experience, aside from gaining other tangential soft skills such as teamwork, communication, networking, and empathy, among others. Interestingly, the reflections showed that students found the challenging tasks in the class to be the most valuable aspect that they gained, which is contrary to the teachers' expectations. This shows that implementing reflective learning can help the students themselves gain an understanding of their learning process; on the other hand, teachers also gain insight into strengths and weaknesses of their syllabus and can adjust their classes accordingly.

In the context of pre-service teacher education, there have also been cases where Design Thinking is combined with reflective writing in the classroom. For example, Baran and AlZoubi (2023) reported that pre-service teachers in their study were able to shift their perceptions of the design thinking process in education, and of their own role as designers and change agents. They did this through weekly reflective writing in a classroom that utilizes the Design Thinking module to teach learning technologies. Another study by Henriksen, Richardson and Mehta (2017) reported how reflective writing was integrated as part of the final exam in a graduate-level class focused on using design thinking to approach and solve educational problems creatively. The reflective writings collected show how students were able to not only reflect on design thinking as experienced in their class, but also on it as a method that can be utilized in general for their career in education. For instance, one student was able to draw comparisons between design testing and traditional educational testing; another student recorded the transformative experience Design Thinking has given them, such that they look forward to applying it in their future endeavors. These and many similar studies are a testament to the power and usefulness of implementing reflective learning in a design-focused classroom.

3. Research Methods

3.1 Research Design

This study employed a qualitative research design, as undertaken for a similar topic by Hashim et al. (2023). According to Lim (2024), qualitative research has five main advantages: contextual relevance, in-depth insights, holistic perspective, recognition of participant voice and scope for flexibility and reflexivity. Contextual relevance, in-depth insights and recognition of participant voice are all crucial in

ensuring that this research, with a limited number of participants, can thoroughly account for their perspectives that is grounded in the specific context defined here. On the other hand, holistic perspective and scope for flexibility and reflexivity enable the researchers to consider all relevant aspects that may influence the analysis of the data, as well as react and adjust the analysis accordingly, based on emergent data. As such, the qualitative research design was deemed the most suitable for this project. Additionally, since participants of the research come from the class that one of the authors teach, this study can also be classified as class action research.

3.2 Participants

Participants for this project are 14 students who were enrolled in a Design Thinking class for undergraduate students in the Department of English Language Education at a private university in Jakarta. The students were all from the same cohort and were enrolled in their third semester at the university. These students were also paired into 6 groups to collaborate on a semester-long project involving the development of a user-centered lesson plan, grounded in the Design Thinking approach.

3.3 Instruments

In this study, the researchers utilized different instruments that students use to reflect on their prototype testing experience, including: (i) non-directive interviews that asks open-ended questions and utilize spontaneous engagement, (ii) self- and peer evaluation forms; and (iii) student reflective essays.

3.4 Data Analysis

The collected data were analyzed in two ways to answer RQ 1 and RQ2, in accordance with the structured guide of Gibb's reflective cycle adjusted to the current research's learning objectives, assignments, and classroom situation. For RQ 1 on the implementation of reflective learning in a Design Thinking class, table 1 shows the parameters for data categorization are as follows:

Table 1. Stages, descriptions, and classroom practice for categorizing

	Stages	Description	Classroom Practice
1.	**Description** *What happened?*	Students describe what happened, what didn't happen, and what should have happened during their prototype demonstration.	Cool down consultation
2.	**Feelings** *What were you thinking and feeling?*	Students explore their thinking and feelings during their teaching demo. They should try not to make any subjective judgement/analysis. They have to be aware of their own thoughts and feelings when describing what happened during the demo.	Cool down consultation
3.	**Evaluation** *What was good and bad about the experience?*	Students evaluate their bad and good experiences during the demo using the evaluation rubric from the instructor. They should also be able to identify strengths and weaknesses from the prototype testing.	Evaluation rubric (self & peer feedback)
4.	**Analysis** *How would you interpret the situation?*	Students read and evaluate commonalities of their prototype strengths and weaknesses from their self- and peer evaluations. Then, they must identify potential revisions to their prototype that can address their most saliant weaknesses.	Section A: Evaluation summary and problem areas
5.	**Conclusion** *What other actions could you have taken?*	Students execute the potential revisions identified in the previous step and must provide justifications based on the evaluations for the changes made to the prototype.	Section B: Changes made to address problem areas and explanation

6. **Action plan**: *If it occurred again, how would you handle it?*	Students reflect on the whole testing process, including the reflective processes preceding this last stage, and consider lessons learned that can reshape their attitudes and beliefs as future educators beyond the class.	Section C: Reflection
Learning Outcome	Students offer a final product as a response to the overall learning experience, and support the rationale for their final product in the form of reflective essays	Final Prototype and Reflective Essays (revised/modified teaching material)

For RQ 2 on ways in which reflective learning help students process, evaluate and improve their own lesson plan, student reflections in the final paper that they submitted along with their final lesson plan prototype were analyzed using thematic analysis to uncover recurring topics. Thematic analysis is used because it is the most suitable analysis method for qualitative data concerning a case study, such as this study (Peel, 2020).

4. Results & Discussion

4.1 Implementation of reflective learning in a Design Thinking Class

While reflective learning is useful for a range of different classroom designs, the iterative nature of the Design Thinking process makes it a natural fit for reflective learning. Designers are required to test their prototype and use the testing to make the prototype better; this process can be repeated more than once until they get the desired results. This necessitates that the designers reflect on their own experience during the testing process, also taking into account what they observe, as well as feedback from experts, peers and potential users. However, most classroom implementation of reflective learning for Design Thinking courses concentrate mainly on reflective writing activities on a macro level; they ask students to reflect generally on the Design Thinking process as experienced in the classes that they take (Lynch, et al, 2021; Baran and AlZoubi, 2023; Henriksen, Richardson and Mehta, 2017; among others). This present study, on the other hand, offers something new in that reflective learning is applied on a micro level; students were asked to reflect specifically during the Testing stage, and the subject of reflection is their own Prototype, not the whole design thinking process. This micro-level implementation allows teachers to apply the complete Gibb's reflective cycle because students must come up with a concrete action plan to revise their prototype, which is something not immediately present in the typical reflective learning model that is applied to the whole Design Thinking course.

4.1.1 The class set up

The class was set up such that students were grouped into 6 small groups to encourage collaborative and cooperative learning: Group A, B, C, D, E, and F. The groups were paired so that each can role-play as both designers themselves and potential student users for their partner group. Class meetings were then structured around the 5 stages of Design Thinking explained in sub-section 2.1 above. The instructor taught students the concepts and necessary skills to conduct the different stages, and the students would then apply those skills immediately stage-by-stage. As the students were all English Language Education majors, the project was limited to identifying English learning problems, and possible solutions were also limited to those that can be demonstrated in a short 30–40-minute lesson plan. All the groups submitted a lesson plan as their prototype for their midterm; the second half of the semester was then dedicated to individual group lesson plan demonstrations in class (prototype testing). It was at this testing stage that reflective learning was implemented by the instructor, with the goal of helping students revise their lesson plan prototype for their finals. In the rest of this sub-section, the researchers lay out how the different steps involved in reflecting on the prototype and prototype testing map out to Gibb's reflective learning cycle.

4.1.2 The reflective learning cycle

The first stage of the reflective learning cycle implemented by the researchers begins immediately after each group finishes their prototype demonstration. This was done in the form of a private cool down consultation just between the designers and the instructor, whereby the designers of the prototype were asked to freely reflect on their demonstration experience. This was done privately and unstructured with the instructor, so the designers can candidly share how they think and feel about the testing session that just happened. The cool down consultation after the demonstration gives students the opportunity to describe what happened and what they were thinking and feeling, in line with the first two stages of Gibb's reflective cycle. The immediacy of this reflection session ensures that the experience was still as vivid as possible to the students, so that they can give more detailed descriptions of the event, as well as their feelings. This was also done in an informal conversation style to make sure students can be candid with their descriptions and feelings, foregoing the filter that they would have had if this were done through a writing activity. Moreover, the intimacy of doing this privately with the instructor also provided the students with more freedom to be honest without the risk of embarrassment, thus, creating a low-risk and positive environment where students can be free to explore their thoughts and feelings.

Shortly after, the designers were then asked to self-evaluate their teaching demonstration using an evaluation sheet that the instructor of the class has shared beforehand; other classmates who role-played as students in the demonstration, as well as those who just observed the demonstration also had to fill in the same evaluation sheet to give the designers feedback on their performance. The evaluation sheet consists of 2 parts: (i) an evaluation rubric; and (ii) short answer questions about the teaching demonstration. In the evaluation rubric, criteria such as topic and related objectives, clarity and organization, teaching methods, interaction with students, use of technology, as well as delivery and presentation may be evaluated as excellent, satisfactory, needs improvement or not acceptable; students are also asked to leave comments supporting their evaluation for each criterion. In the short answer part, students give evaluations on strengths, weaknesses and potential improvements that can be made based on the prototype demonstration. The use of the same evaluation sheet for both self-evaluation and peer feedback give students clear guidance on which criteria they need to focus on. At the same time, the uniformity of the evaluations aids each group in analyzing and synthesizing the plethora of feedback they get, so that they may pinpoint changes that can be implemented to their prototype.

The last stage of the reflective learning process combines Gibb's analysis, conclusion and action plan stages into a three-part reflective essay that the students must submit along with their revised prototype for their final exam:

1. Part A: Based on the evaluations, students are asked to **analyze** all the feedback they get. They must read and synthesize the feedback they received from their peers and the instructor with the goal of summarizing the feedback and identifying potential revisions that must be made in the prototype revision based on the most pressing problems identified in the evaluations.
2. Part B: The students draw **conclusions** from their analysis and execute possible changes to the prototype. They must explain exactly the changes that they have made to the prototype, as well as the rationale behind those changes, relating back to their analysis of the feedback they have done in Part A.
3. Part C: Students are required to reflect on an **action plan** beyond the immediate project. They reflect on difficulties faced in the analysis stage and consequently the lessons learned that may be useful in their professional development as educators.

The instructor of the class used a rubric to evaluate the final reflective writing that put most of the grading weight on the reflective process, such that 65% of the final project grade depends on the analysis, conclusion and action plan done, as reflected in parts A, B, and C of the reflective essays

elaborated above. On the contrary, the language of the report is weighed at only 15%, while the prototype product itself makes up 20% of the grade; this is due to the nature of the class as a Design Thinking class, not a class on curriculum or lesson planning that may put more emphasis on the technicalities of the lesson plan product. As laid out above, the implementation of Gibb's reflective cycle in the reflective learning process allows the instructor to guide students step-by-step through increasingly more demanding cognitive reflection, starting at the level of description, progressing to analysis and eventually action plan. This was implemented through tasks that also progress in complexity, starting with an unstructured sharing session, followed by the evaluation sheet, culminating in a series of complex short essays. As a result, students were well-prepared and able to reach the goals set out in the grading rubric.

4.2 Ways in which reflective learning help students process, evaluate and improve their own lesson plan

In this sub-section, the researchers report on the result of thematic analysis from students' reflective writing.

4.2.1 Process: description over feelings

When asked to describe what happened and their feelings immediately after the teaching (prototype) demonstration, students mostly focused on descriptions of what happened, what did not happen, and what should have happened. with very little attention given to feelings. Marathe and Sen (2021) identify that there are different levels of depth in the reflective learning process. The lowest level of depth does not involve any emotion and only considers what happened at an event, and what happened preceding the event that might cause the event to unfold the way that it did. All the groups were able to reflect at this level as they explained how their lesson plan and its implementation was good overall, but they also found that not everything went as well as planned. Overwhelmingly, many expressed that they were not able to do everything that they prepared, and that the testing with classmates role-playing as students resulted in some unexpected interactions. While describing how they were not able to do everything they planned, many groups also immediately started evaluating the cause for this problem, and many came to the initial conclusion that they have prepared too many materials, or that they have miscalculated how long each activity would take. This reflects that students were able to think about what happened and identify possible reasons for what happened.

Marathe and Sen (2021) further explain that the second level of reflective learning involves students being in touch with their own feelings, while the highest level of reflective involves students considering the emotions of others, thus, elevating the reflective learning into an empathetic reflective learning experience. Unfortunately, the students in this study did not show that they have reached these levels of reflective capability. For example, only group F shared they were very nervous at the beginning of the teaching demonstration and lamented that this caused them to skip their opening that should have involved explaining the overall lesson plan and objectives before starting the teaching demonstration. This shows that the group was somehow able to express their own emotions during the event to relate it to what they described as a failed aspect in their prototype testing. However, none of the groups were able to take on the perspective of their users. For instance, group E expressed that they expected their users to be much more active in answering questions and participating in the activities. Group D, on the other hand, lamented the fact that their users did not come up with answers that they expected in some of the tasks they designed, resulting in them having difficulties in reacting to those answers. It is clear that while some students were able to incorporate their own feelings in their reflective learning process, most of them are still struggling with doing reflection with empathy.

It is important to address this issue because reflecting without taking others' feelings into account can lead to the reflector justifying what happened and their own feelings; they tend to see the event happening and its cause as external to them, for which they have no control (Marathe and Sen, 2021). This is seen in how some students shift the 'why' of what happened in their teaching demonstrations onto their users. Of course, reflecting with empathy is a very complex process and other studies have shown that people tend to struggle with this (Gerace, et al., 2013), because the process necessitates

emotional work dealing with their own feelings, as well as the feelings of others (Cameron, et al., 2019). Nevertheless, it is important to take this into consideration in future implementation of similar Design Thinking classroom models. Students may benefit from instructions and specific questions that ensure they engage with their feelings and the feelings of their users during the reflective learning process.

4.2.2 Evaluate: synthesis and prioritization of different feedback

At this stage, the expected outcome is that students are able to identify and evaluate problem areas and other potential parts during their teaching demonstrations and peer evaluation. Aside from those components, self-awareness is the soft skill needed to evaluate the entire learning process. The reflections from Groups A to F really highlights key areas where the students can improve their teaching materials, demonstration, and other skills relevant to teaching, i.e., teacher's confidence, teaching materials, technology, and knowledge of subject matters. From the feedback summary, many evaluators – the peer students – pointed out that these students need to focus on clarity, classroom engagement, and making sure that their students are grasping the material.

In the case of Group A, they had mostly positive things to say, particularly on how engaging the use of a television show clip and the Kahoot game were; the integration of these two media in teaching material really managed to capture students' interest. Yet, Group A raised some concerns on time management: the lesson transition from pre-activity to main activity was time consuming due to the 'teachers' prolonged explanation on unfamiliar vocabulary items. A more efficient approach could have been encouraging students to look up the meaning of these unfamiliar vocabulary words themselves. This is also a concern about preparing a set of pre-teach vocabulary items beforehand. In the final prototype (Figure 1), Group A clearly addressed this issue by streamlining their vocabulary activity and making students look for the meaning of vocabulary items themselves; whereas in the early prototype, they simply asked students to underline unfamiliar words and put the burden of explanation on the teacher. This serves to save time while also creating a more student-centered learning environment.

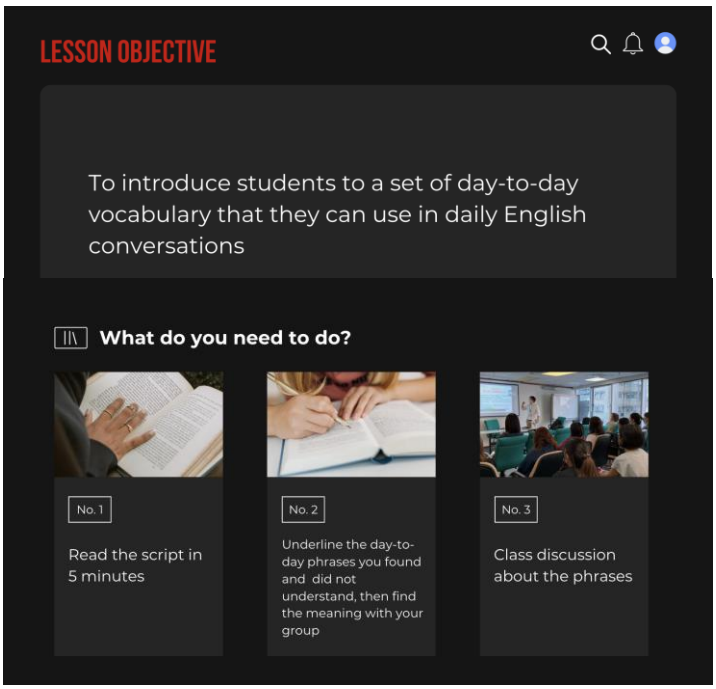

Figure 1. Some changes made by Group A for the final prototype

- *Group A*

"In addition, there were several comments regarding the objectives of the lesson being somewhat unclear and unsuitable for the session. The two objectives were to introduce new vocabulary and to improve students' confidence in speaking. However, in the current conditions, *the* ***first objective cannot be fully achieved due to time restrictions*** [italics added], causing doubt on whether the second objective can be achieved at all at this point of the lesson."

In the final prototype handed in as part of the final paper, Group A also reduced their lesson objective into one single objective, as opposed to the two unrelated objectives described in the excerpt above (see Figure 1 for reference). The changes made to the final prototype are clearly related to the reflections the group has made, showing how reflective writing is useful in helping students recognize not only problem areas, but also room for improvement. Group A's evaluation on their own problem areas offers insights into how Design Thinking principles are applicable and highly relevant to reflective learning. Since Design Thinking emphasizes iterative process and empathy towards users, Group A's prototype demonstration incorporated these principles by addressing their time management issue and making use of media: television clips and Kahoot games to spark students' interests – showing the empathic aspect of Design Thinking.

In the same vein, Group B experienced similar challenges related to minimal interactions with their audience and lacking teacher confidence, leading to less and less classroom engagement. Peer feedback results emphasized the importance of teacher comprehension checks and feedback during tasks, noting that lacking these elements would reduce the lesson effectiveness. Despite lacking interactions, Group B managed to gain students' engagement by using videos and provided opportunity for students to freely express their opinions.

- *Group B*

"The first aspect is improving ***the connection between specific objectives***...The second aspect we plan ***to improve is the transition between the two videos used in the lesson***...This kind of activity helps students to identify the essential element of effective interviewing before moving onto the second video...Last but not least, the third aspect ***we want to fix in the final prototype is adding a new activity to make new spaces to have situations where teacher to students interaction also student to students interaction*** [italics added] by asking them to search up the information first about the 2 types of questions in pairs...By making those improvements, we aim to create a more engaging, interactive, and effective learning experience for students."

Reflectively, Group B documented their process diligently, while addressing their drawbacks by planning to clarify the connection between lesson objectives, improving transitions between activities, and introduce collaborative tasks for the purpose of increasing student's engagement, interaction, and critical thinking (Engliana & Ekarina, 2024). Collaborative task is proven to be one of the effective methods to boost creativity, critical thinking, problem-solving skills, and empathy. Concretely, Group B added the slide in Figure 2 below in their final prototype, after doing the complete reflective cycle as instructed by the lecturer. This additional activity serves as a logical transition between the previous activity where the group plans to show examples of conducting good interviews and the next activity involving a lecture on different types of interview questions. At the same time, the activity encourages students to work collaboratively in looking for information that is relevant to the topic being discussed in class. This further demonstrates how the students were able to use the reflections to execute a relevant change to improve their prototype.

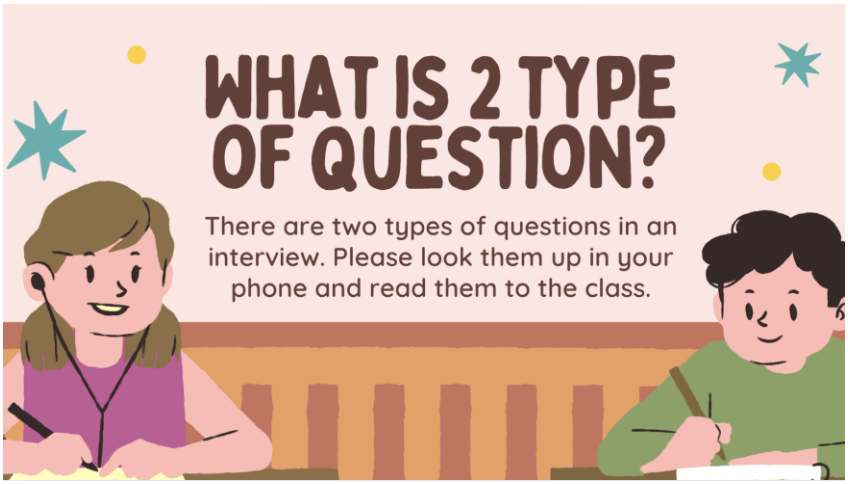

Figure 2. A sample activity from Group B's final prototype

Group C identified their inconsistencies in teacher confidence and teacher enthusiasm, including poor time management and confusing task instructions. In the beginning, they took too long to introduce too many vocabulary items at a rapid pacing which further complicated the learning process – leaving the students confused and baffled with the lesson. They do, however, also acknowledge their high engagement levels and interactive teaching method.

- *Group C*

  "***The pacing of asking and answering questions was too fast***. It would help to slow down and take more pauses. But it is already good that the teacher constantly asks about students' understanding."

Based on Group C reflection on problematic areas, their reflective practices were primarily retrospective. The early prototype demonstration showed that they were innovative but not aligned with actual students/classroom needs.

Group D demonstrated a good balance execution of the Design Thinking process. They exposed effective use of teaching materials, such as quizzes, videos, and efficient use of technology. Yet, the criticism they received was lacking student-teacher interactions, excessive use of vocabulary, and monotonous teaching style.

- *Group D*

  "The strengths are mostly talking about the teaching materials such as quiz and video, the use of technology, and others such as topic, duration, attire and volume. On the other hand, the weaknesses are talking about the ***lack of interaction*** with the students, ***too much vocabulary*** or needs improvements in the vocabulary, and too ***monotonous teaching***."

The group planned to address these issues by focusing on specific, relevant vocabulary items, used Mentimeter for efficient quizzes execution, and a more detailed explanation on quiz answers for the purpose of student engagement and knowledge comprehension.

Group E identified the need for clearer and more specific lesson objectives – similar to Group A, organized lessons, and enhanced teaching methods. The peer evaluation mentioned that Group E were disorganized in lesson objectives.

- *Group E*

  "Firstly, while presenters stated their objectives and intended demonstrations, t***hese often lacked the necessary specificity to guide the 'students' (peers acting in that role) effectively...*** Secondly, the demonstrations sometimes ***lacked clarity in how the lesson content should be***

delivered. This could result in a disorganized and potentially confusing learning experience for the students ...Thirdly, the ***teaching methods employed require improvement***."

In order to respond to such pitfalls, they planned to adopt Specific, Measurable, Achievable, Relevant, and Time-bound (SMART) objectives for their final lesson plan prototype, provide clear explanations, and comprehension checks. This group shows that self-awareness and positive attitudes are needed to receive comments from other peers and be able to seek plausible and effective solutions to generate objective outcomes in task planning and demonstration.

The final group identified several concerns, including the excessive length of reading materials, a lack of clarity in aligning objectives, and the ineffectiveness of student handouts stemming from inadequate instructions. Peer feedback also pointed out that the lesson delivery had very little classroom engagement hindering effective learning. In response to these drawbacks, Group F planned to look for more suitable texts that were shorter and relevant to the learning objectives. They also needed to revise learning objectives and learning/classroom activities to make them more aligned, and make the lesson to be more student-centered, for example, by providing clearer examples. These planned changes stemming from Group F's own reflective exercise resulted in relevant changes to their final prototype. In Figure 3 below, for example, the group has added a slide with clear instructions and clear examples of what they expect the students to do, addressing their observation that their lesson had inadequate instructions.

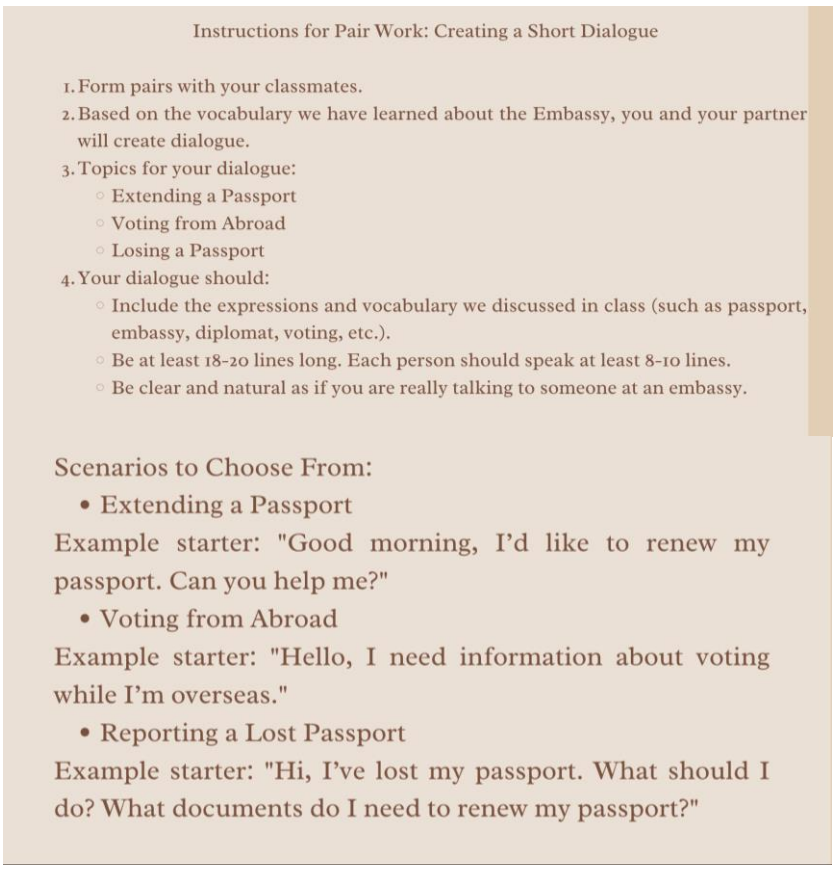

Figure 3. Some changes made by Group F in their final prototype

The collective feedback from all the groups reveals several similar problematic areas in their lesson plan prototype demonstrations: a) clarity of lesson objectives in alignment with lesson/classroom activities and the accompanying materials, such as handouts, videos, instructions, and technology use; b)

student-teacher engagement; and c) consistent implementation of comprehension checks throughout lesson demonstrations. By addressing these three main problem areas, students are more likely to successfully create or design more interactive, practical, and student-centered language learning experiences.

In the domain of teacher education, these three overarching areas highlight the ongoing challenges and recurring problems, especially for pre-service teachers. The issue of the necessity to provide clear lesson objectives and their alignment with instructional materials are often emphasized in various studies, because when the instructional materials are appropriately aligned with the classroom materials, the engagement between students and teachers increases (Hedge, 2003; Makgabo & Niipare, 2022). To sufficiently address these problems, it is vital for student teachers to explicitly identify and carefully choose their lesson objectives. Next step is constraining the instructional materials and technology directly relevant to the chosen objectives. Regular comprehension checks during the lesson will enhance classroom engagement and help develop students' metacognitive skills (Su & Liu, 2012; Yeldham & Gruba, 2016).

4.2.3 Improve: the value of diverse feedback, perspective taking and implications beyond the class

In the last section of the students' final paper, they were asked to reflect on the prototype testing process. In the final paper instruction, the instructor of the course specifically asked students to consider their process of synthesizing all the feedback they received, as well as peer feedback alignment with their own self-assessment of the prototype demonstration. Consequently, most students show signs of perspective taking, where they consider the point of view of their users. For example, group D concluded that the testing process made them realize the "blind spots" of their own self-evaluation. Similarly, group C indicated that they learned how they "might not notice certain issues until others point them out." Group A also recognized that "teacher and student perceptions can vary greatly on the same things." It is encouraging that several groups also found value in reading evaluations that confirm their self-evaluation and self-management since "individuals with high self-efficacy are more likely to engage in self-management strategies, such as setting goals, monitoring progress, and adapting their learning approaches" (Susanto et al., 2024, p.135). For instance, group B appreciates getting confirmation from peer feedback on what they themselves feel needed to be improved on for their final prototype. This shows that students came to the realization of how important diverse feedback is, to check or confirm their own perceptions. However, because the instructor did not directly specify that students should reflect on their users' feelings, students still did not consider the emotions of their users.

It is important to note that students were able to also draw wider conclusions from the focused reflection of their testing event and evaluations. Students share that the series of tasks that involved testing, reflecting and improving their prototype have provided them with an opportunity to change their professional attitude, beliefs and values as future educators. The following are selected excerpts from student reflections that demonstrate this:

- *Group B*

  "....This kind of experience taught us about how important it is to listen and learn from feedback and use it to make improvements. It also shows us how helpful it is to get feedback from different people and from the expert which is the lecturer, because it can confirm what you already know or give us new ideas to polish up the weaknesses. **Beyond this class**, we can use these skills in many areas, such as when **giving presentations, leading a team, or working on projects**....."

- *Group E*

  "...the journey of designing, testing, and evaluating this teaching demonstration prototype has been a profound learning experience. The insights gained, particularly regarding the importance of clarity, audience awareness, and adaptability, have implications that extend far

beyond the classroom. They will undoubtedly inform **my future endeavors in communication, training, and collaboration**, enriching my ability to effectively convey information and facilitate engaging learning experiences..."

- *Group F*

"...Beyond this class, the lessons learned from this evaluation process will be invaluable. The ability to critically self-assess, to analyze and synthesize feedback, and to use that feedback to improve our work are crucial skills for any professional, especially in the field of education. This experience has equipped us with a practical framework for continuous improvement, which **we will undoubtedly apply in our future teaching endeavors**..."

This selection of snippets from students' reflections clearly shows that students can connect what they have learned from a specific event (the prototype demonstration) to the wider context of their future professional life. Mohammed (2016) reported similar findings whereby reflections using critical event analysis (Tripp, 1993) is shown to bring change to the values held by educators. In this case study, it was shown how a reflection of a specific critical event involving confrontation between a teacher and defiant students could bring about change: (i) to the views and beliefs of the teacher educator, and (ii) the way they can deal with similar situations in other professional contexts. This highlights the importance of such micro-level reflections, especially for beginner students such as the ones involved in this study. The focus on a contained event makes it easier for the students to reflect and process what happened, yet the lessons learned can be applied far and wide beyond the classroom.

5. Conclusion

The previous sections have detailed how the researchers implemented reflective learning in a Design Thinking class for English Education majors. The class design was specifically targeted at the testing stage of Design Thinking and consisted of three steps: (1) a cool down consultation; (2) evaluation through rubrics; and (3) reflective essays; all of which are aligned with Gibb's reflective cycle. Thematic analysis done on data from these steps uncovered that reflective learning is helpful in supporting students not only in revising their final prototype, but also in shaping the way they think and approach their professional work as future educators.

One main weakness found in the implementation of reflective learning in this class is the lack of focus given to the reflection of feelings and emotions. As this is an important element of the reflective learning cycle, future implementation of similar teaching design should add this emphasis on reflecting emotions. This can be done through specific discussions while delivering the Design Thinking material to students, and by adding empathy or emotions specifically to the reflective writing assignment instructions.

On the other hand, while this study has uncovered that students were generally successful in reflecting in-depth about their testing process, much of this can be attributed to the instructor's specific questions and directions. It is, thus, unclear how much the students have internalized the reflective learning habit, or if they would be able to effectively engage in reflective learning independently. Therefore, a comprehensive curriculum design would need to address this by progressively decreasing the students' reliance on teacher instruction in the reflective learning routine. Additionally, the researchers must also acknowledge a few other limitations of the study: the small sample size from a single university in Jakarta, and the class action research design. The limited number and type of participants involved may make it difficult to generalize the insights gained through this research. On the other hand, the class action research design gives the study a high risk of research bias. As such, more similar research exploring the implementation of reflective learning in Design Thinking needs to be done with a larger and more diverse sample to ensure that the findings can be supported by more robust data.

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