PBL LANGUAGE CASE-DESIGN MODEL: THE ISSUE ON 'ILL-STRUCTUREDNESS'

Suraini Mohd-Ali[1]*, Norhaili Massari[2], Normazla Ahmad Mahir[3], Haliza Harun[4], Hazleena Baharun[5], Fariza Puteh-Behak[6], Noor Saazai Mat Saad[7], Ramiaida Darmi[8]

[1]Dr., Universiti Sains Islam Malaysia, MALAYSIA, suraini@usim.edu.my
[2]Ms., Universiti Sains Islam Malaysia, MALAYSIA, norhaili@usim.edu.my
[3]Ms., Universiti Sains Islam Malaysia, MALAYSIA, normazla@usim.edu.my
[4]Dr., Universiti Sains Islam Malaysia, MALAYSIA, haliza@usim.edu.my
[5]Dr., Universiti Sains Islam Malaysia, MALAYSIA, hazleena@usim.edu.my
[6]Dr., Universiti Sains Islam Malaysia, MALAYSIA, fariza@usim.edu.my
[7]Dr., Universiti Sains Islam Malaysia, MALAYSIA, noorsaazai@usim.edu.my
[8]Dr., Universiti Sains Islam Malaysia, MALAYSIA, ramiaida@usim.edu.my
*Corresponding author

Abstract

Problem-Based Learning (PBL) aligns with approaches required in second language learning and teaching in which students learn the target language by practicing it and thus, making it an acceptable pedagogical choice to cater for the need of the language learners. Case/Problem is the core element in PBL. The important characteristics of PBL include students learning with an ill-structured problem in which the problem acts as the starting point to structure the learning agenda. However, due to lack of knowledge and experience in crafting cases and the scarcity of case design models for language, practitioners often find it challenging to employ PBL approach in their classrooms. This research aims to study the feasibility of using the 3C3R Case-Design Model (Hung, 2006) in terms of 'case ill-structuredness' in crafting PBL cases for a General English Proficiency (GEP) Course. In this Action Research approach, four steps (planning, action, observation and reflect) were closely followed within two cycles of the action research procedure. Data collection tools were observation checklist and focus group interviews with a group of English language practitioners which was then analyzed using content analysis for emerging themes. The findings revealed some significant themes pertaining to the need for adaptation and inclusion of other components in the model to craft PBL cases for language courses. One of the significant themes was on 'ill-structuredness' as a component to be included in the 3C3R model. The findings also suggest the importance of the emerging PBL Language Case-design Model for language teaching which is expected to be a reference not only for English Language practitioners with limited case-design knowledge but also practitioners teaching other languages, for their specific classroom goals.

Keywords: Problem-Based Learning (PBL), PBL Language Case-Design Model, Ill-structuredness

1 INTRODUCTION

Problem-based Learning (PBL) refers to a curriculum theory or an instructional model or an instructional practice to cover a wide-range of educational practices, ranging from problem-oriented lectures to completely open experiential learning environments (De Graaf & Kolmos, 2003). The essence of PBL is learning around problems/cases rather than discrete subjects (Savin-Baden, 2000). In a PBL learning environment, students work in groups/teams to solve an ill-structured problem/case and are not required to acquire a pre-determined series of right answers. The ill-structured problem presented in PBL requires learners to engage with a complex situation presented to them and decide what information they need to learn and what skills they need to gain in order to manage the situation effectively (M. A. Suraini et.al., 2016). Thus, PBL reflects the real world scenario because the ill-structured problems encountered by learners are the potential types of problems learners might encounter in the real world where there will not be any predetermined solution or right answer. The learning curve in PBL classrooms is the ability to produce the most viable or possible solutions or options for the presented problem.

Previous research on PBL have focused on various implementation and learning outcome issues, such as the role of tutors (Wilkerson & Hundert, 1991), students' perceptions (Caplow, Donaldson, Kardash, & Hosokawa, 1997), group size (Lohman & Finkelstein, 2000), group processing skills (Achilles & Hoover, 1996) and the rate of board exam passage (Albanese & Mitchell, 1993; Norman & Schmidt, 1992).

Somehow, concerns with regard to case-designs seem to receive little attention. Lambros (2004) and Weiss (2003) are among researchers whom have discussed the design of PBL cases. However, the discussions seem to be quite general, thus inadequate in providing educators and practitioners with the needed conceptual framework to design effective PBL cases. Duch (2001) contended that the case itself is key to the success of PBL. To investigate the effectiveness of PBL problems/cases, Dolmans, Gijselaers, Schmidt and Van der Meer (1993) analyzed the correspondence between the instructors' intended objectives and the student-generated learning issues based on their interpretations of the PBL cases. They found that only 64% of intended content was identified in the student-generated learning issues. Hence, without assurance of the quality of problem or intended aims being met, the effects of PBL are unpredictable and questionable. Drummond-Young and Mohide (2001) proposed an eight-step PBL problem development process specifically designed for nursing education, which unfortunately rendered the process too domain specific to be used in a wider range of contexts.

Within the area of second-language learning and teaching, problem-based learning aligns with approaches in which students learn the target language by using it, rather than being presented with and then practising predetermined language structures (Matthews-Aydinli, 2007). To maximize language learning outcomes, ESL practitioners need to prepare students for the language demands of the problem-solving activity. Activities to prepare students vary according to their proficiency levels. These may include pre-reading or pre-writing exercises, discussions to link the problem with students' knowledge and experiences, or pre-teaching vocabulary and structures that will be useful in finding solutions to the problem. However, not many language practitioners have the knowledge on crafting activities (cases/problems). To craft PBL cases, one needs training or guide to become case-crafters. Lack of available resources on PBL cases for language and guides compounded by the issue of specific PBL case-design models for language courses, have driven the researchers to embark on the current study with this research question:

1. How does the 3C3R PBL Case-Design Model (Hung, 2006) assist the English Language practitioners in terms of 'case ill-structuredness' in crafting PBL cases for General English Proficiency (GEP) course?

Hung (2006) has developed a 3C3R PBL Case Design Model which is expected to be a framework to design effective, precise and reliable PBL cases and this model is used as the theoretical framework for the current study. The 3C3R model consists of two classes of components: core components and processing components. Core components include content, context and connection, and are used to support content/concept learning; processing components composed of researching, reasoning and reflecting, concern the learners' cognitive processes and problem-solving skills. The core components of the 3C3R model—content, context, and connection— are primarily concerned with the issues of appropriateness and sufficiency of content knowledge, knowledge contextualization and knowledge integration. Thus, this case design is used as the basis for training the research participants on the PBL case design to the feasibility of the model in terms of the 'case ill-structuredness' in crafting PBL cases for a language course.
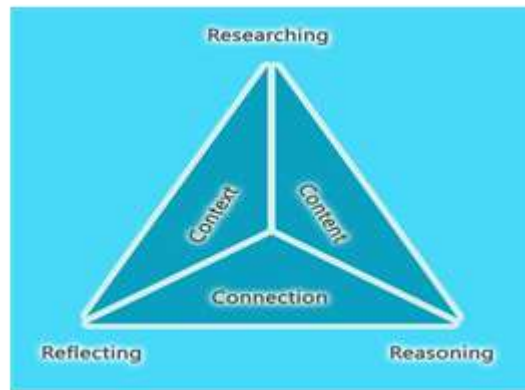
Fig. 1: The 3C3R case design model (Hung, 2006).

2 MATERIALS AND METHODS

This study was carried out using the Action Research approach in which the four steps (planning, action, observation and reflect) were closely followed within the two cycles of the action research procedure. A total of eight participants who are experienced English language practitioners with little or no PBL knowledge took part in this study. These participants have been in the ESL teaching field at tertiary level between 10-15 years. These participants teach the university's English Language course, i.e. General English Proficiency Course (GEP). GEP course is a foundation course that equips students with basic language skills and is geared towards developing students to achieve a satisfactory level in the language.

Instruments used to collect data include observation checklist and focus group interviews. The observation checklist consists of the items to be observed: the challenges experienced by the participants to craft the PBL cases and the feasibility of the components in the 3C3R case-design model in assisting the practitioners to craft PBL cases. Data from the observation checklist provided useful prompts for the focus group interviews. The interviews were meant to explore the participants' experiences in the training sessions and the feasibility of the 3C3R case-design model in helping the novice PBL practitioners to craft cases for a language course i.e. GEP course. Open-ended questions were used in the interviews because this type of interview provides parameters within which interviewees can formulate answers in their own words (Mohd-Ali, et. al, 2016).

2.1. Data Collection and Analysis Procedure

The participants underwent two trainings (two cycles in the action research procedure) on PBL Case-design model using the 3C3R Case-design model by Hung (2006). Following the action research procedure, Training 1 was conducted in Cycle One and Training 2 was carried out in Cycle Two.

In Training 1, participants were exposed to PBL approach, the 3C3R PBL Case-Design Model (Hung, 2006), case-crafting for GEP and reflecting session. The case crafting was done in small groups using the 3C3R case-design Model and participants were guided by steps to assist them through the model. The participants were given access to computers and internet to assist them with materials search for crafting cases and they were also encouraged to refer to their Course Textbook or Course Outline/Information to align the PBL cases with the intended GEP syllabus.

Having been exposed to the elements through the steps earlier, in Training 2, the practitioners were not given the steps and were given the freedom to work the processes on their own. The researchers were present in the crafting teams as participant observers with the observation check list to tick the checklist accordingly and document the challenges and chasms experienced by the participants to craft the PBL cases and the use of the 3C3R case-design model.

2.2. Data Analysis Procedure

After Training 1 and Training 2, the observation checklists were gathered from researchers and analysed to be used as prompts for focus group interviews. The interviews were recorded and later transcribed. Content analysis was done on the transcripts with the aim of retrieving the themes. The data from the observation checklist and interviews were used to interpret the experiences of the language practitioners in crafting PBL cases for GEP with the aim to provide a better guide for them for crafting PBL cases in future.

3 RESULTS & DISCUSSIONS

In this section, the findings are presented and discussed based on the following research question:

1. How does the 3C3R PBL Case-Design Model (Hung, 2006) assist the English Language practitioners in terms of 'case ill-structuredness' in crafting PBL cases for General English Proficiency (GEP) Course?

The discussion on the findings for the research question are centered to the practitioners' perceptions and experience with regards to the element of ill-structuredness in crafting the language problems/cases using the 3C3R Model, and how these relate to the emerging PBL Language Case-design Model. Total number of eight practitioners have been divided into two groups; Group 1 (P1, P2, P3, P4) and Group 2 (P5, P6, P7, P8). The practitioners have undergone two Workshops on how to craft PBL language cases and excerpts cited below are based on post-Workshop interviews.

3.1 On *Ill-structuredness*

An important characteristic of a PBL problem is the element of ill-structuredness, where "the initial situations do not provide all the necessary information to develop a solution, and there is no one correct way to solve the problem" (Chin & Chia, 2005). This research finds that the PBL awareness workshop cum first-hand crafting language problems/cases session conducted was very enlightening and helpful, before the practitioners engage in the second session of crafting the PBL language cases. The sessions have assisted the practitioners' understanding of the concept of "ill-structured problems", central to the crafting of the PBL problems/cases, which was successfully acquired through the workshops. The practitioners' responses are reported verbatim, however, at certain points, emphasis was added to maintain the consistencies of meaning to responses deemed needed.

P3	In the first workshop, I got confused between the structured mode content and the ill-structured content. But after having done the first workshop and the second one, I began to understand what is the meaning of ill-structured that we have to go through in order to achieve how to craft the problems that [have] 'ill-craftedness'.
P1	We struggled in the first one.
P2	We argued and fought.

Practitioners who participated in this research's workshops are able to see the connections between the problems and solutions, and how to present the cases/problems to the students, as evident in this response:

P2	…I think after two workshops, we can see the connection between the problem and solution and how we should present, not to give too much not to give too little.

This understanding concurs with Chin and Chia (2005) statements earlier and shows that after the awareness and hands-on problem crafting workshops, the participating practitioners feel more confident to present the cases/problems to the students using the PBL approach.

After two workshops, the practitioners are not only able to understand the concept of ill-structuredness better and able to craft the language cases/problems with more ill-structuredness, but also find the task of crafting the problems/cases as easier.

P3	:…[now I know a bit more] about ill-structuredness and we got the idea and it is quite easy for us to craft the problem
P1	I think we crafted faster
P3	Yes, faster compared to the first one. …the second workshop…feel slightly more open to any responses that students give…
P2	So maybe we crafted faster because of that. I think the first time we were like..Okay does this fit? Are we giving too much? Are we giving too little?

As ill-structured problems are claimed to work best with PBL, Jonassen (cited in Sipes, 2017) has listed in his typology of problems all eight problem types, ranging from the well-structured to the ill-structured. Out of the eight, 'dilemmas' is acclaimed to be having the criteria of the most ill-structured problems where it will neither provide a definite answer or decision nor will it be agreed by everyone. Hence, this quality of problem type (ill-structuredness) as utilized in PBL works best for students in encountering their everyday situations (Jonassen, 2011). Thus, making it more contextualized and meaningful to students (Sipes, 2017). Interestingly, one of the practitioners highlights the need of having the PBL language cases to be 'really' ill-structured as to ensure its effectiveness in meeting the Learning Outcome (LO).

Researcher	What about crafting then? Because I remember asking you and you are like not so sure of what crafting is at that time. Now?
P1	My understanding of PBL I think in a way still remain the same but have changed between two workshop is again like crafting because I think I understood as such but when we started crafting we were afraid to let go. I mean at least that what occurs to me. So, when we were crafting we were too specific. We want to make sure the students had this in mind and answered it in this way. So it become a task instead of PBL case…that what occurred. So, this time around I see that we were willing to let go, we were willing to make sure that it was really, really ill-structured. Because there's more understanding of what is ill-structured and there's more understanding on what is a good PBL case I guess. I think it become faster. That has change. I mean the crafting itself has change and we started from scratch this time. So, we are so proud of ourselves. Like I mention early on this is a checklist of making sure that all the elements are there to make it a successful and effective PBL case.

Chin & Chia (2005) write, "Most of the authentic problems in our lives are ill-structured". In other words, if language practitioners stimulate their students with PBL language case that contains ill-structured problems, the students will be able to see the 'meaningfulness' and relevancy of what they are learning as they are exposed to authentic situations. By engaging themselves in cognitive processes, they are able to be creative and critical thinkers by formulating research problem, posing questions, designing and conducting investigations, making comparisons, proposing explanations and others (*ibid*).

Relatively, in the interview, several practitioners have highlighted on this:

Researcher	So, well based on your experience, actually guiding these GEP students all the while. Would you be able to do? Would they be able to do and to gain whatever that you want them to gain and achieve the LO that you set?
P3	They will be able to do the task given to them. But, they will present, the solution, they will do the research. But, in term of language use, it is 50/50 and depends on the group. There will be some groups that will achieve the goals, while some, not. They might surprise us too. Because what I noticed is that when we crafted the problems. The problems have to be interesting to them. Yes, students' interest is important. Affective elements must be present. If we are able to get their interests on that, they will willingly do the research, come out with all sort of solutions and all that. Despite the language barrier they will do it. They will find a way.
P2	Yeah, it's true. I think that why we get context like always at the top because if it something unfamiliar to them, they will not respond and added with weakness or limitation of the language it will just fall flat.
P3	I remembered one time when we did another research in class, we were talking about online air tickets. The discussion with the students become heated. All the L1 and L2 were in use. They got somewhere. They responded to the topic, they were engaged with the discussion.

3.2   Ill-structuredness in the emerging PBL Language Model

Ill-structuredness is perceived as the underlying principle that is taken into consideration seriously by the practitioners in this research, in crafting language PBL cases, along with other elements outlined in the 3C3R Model (Hung, 2006) and the emerging PBL Language Model from this research. This provides an important indicator that the practitioners have acquired an understanding of the important PBL principle. While crafting the problems/cases, ill-structuredness is being considered together with the elements of affective and context (from the 3C3R Model and emerging PBL language model) and learning outcome (language skills).

P4	Started with context and affective element. Thought about how important the topic to the students. Try to make the case ill-structured.
P1	I think the same process that we went through I mean the first and second workshop while we were crafting we're thinking it is too specific to the point that the solution is fixed and at the same time we don't want it to be too open that anything goes and there's no learning outcome at all.

In the first workshop, steps (encompassing elements that exist in the 3C3R and emerging PBL language models) were given to the practitioners to proceed with the PBL case crafting. During this workshop, the practitioners were encouraged to follow through the steps accordingly.

Having been exposed to the elements through the steps earlier, at the second workshop, the practitioners were not given the steps and were given the freedom to work the processes on their own. This provides the practitioners the space to make sense of the elements needed and to prioritize them accordingly.

P5	But I think we needed the steps as beginners. Now that we are a bit familiar, we can do without. But again we still need the elements to be included but not in sequence maybe.
P4	Yes, we don't really follow steps. Maybe as guidelines.

Likewise, the second group of practitioners also express their concern over the need of a dynamic process "go back and forth" in meeting the language Learning Outcome (LO).

R	What do you think about the sequences/steps in the model?
P4	Started with context and affective element…Thot about How important the topic to the students… try to make the case ill-structured
P5	Go back and forth between the LO (Learning Outcome) & ill-structuredness. Check rechecked. Whether the topic is interesting, ill-structuredness enough whether can fit in the LO.If too ill-structured, LO might not be achieved.
P4	Theme then language items suitable. E.g. past and present tense on roles of house husband. LO follows the theme/context.
P6	Connection is not a component, I think. It should be elsewhere to show it is dynamic

Unlike the first Hung (2006) 3C3R PBL model, the emerging PBL language model has been added with several new dimensions, the 'Language in Use', affective elements as well as the ill-structuredness. The 'Language in Use' element is placed encircling the existing 3C3R diagram and is interconnected with the other elements.

P1	The later model actually amended based on the discussion that we had with both groups.
P2	I mean it's more polished that I would say so. Because you can see the connections between all the factors when you put it in this way. So, you have like the main is affective and context but its connected to ill-structuredness, learning objectives and all this. And you can see so, I think this is much more polish compared to the last one.
P1	We added another new dimension, Language In Use. Because the rest were around in the first model but the second model the main difference is we have the Language In Use. All-encompassing everything else. What do you this of this?

In the process of refining the emerging models, some suggestions from all the eight participants have been taken into consideration. Unanimously, all eight practitioners agree in the inclusion of Learning Outcome, the affective elements as well as the ill-structuredness in the revised model.

Researcher	How about the 3R?
P5	I thought about the Researching even when we thought about the context. I say that the moment I start thinking about the theme; researching comes to my mind.
P4	At the very beginning.
P6	We didn't think so much about the 3R, our concern was more on the affective, LO

	and ill-structuredness

In addition, as suggested by the practitioners, the emerging model should have encircling arrows to show the recursive and dynamic process during the crafting of the PBL language cases.

Researcher	What do you think about the new case design model?
P6	There should be some arrows to show it is dynamic.
P4	This is better because affective/context is in 1 component. Less confusing since the terms have similar meaning.

By the end of the two workshops, the practitioners have become more knowledgeable with the nature of PBL, more skillful at crafting language PBL problems/cases by embedding the ill-structured elements, more familiar and adept in the steps and in managing the elements outlined by the models in crafting the PBL language cases. The ill-structuredness of the crafted cases functions as catalyst, triggering series of cognitive processes, while the center or heart of the case-design is the Affective element which form the central to all deliberations in PBL language case-crafting as highlighted in the emerging PBL Language Case-design Model.
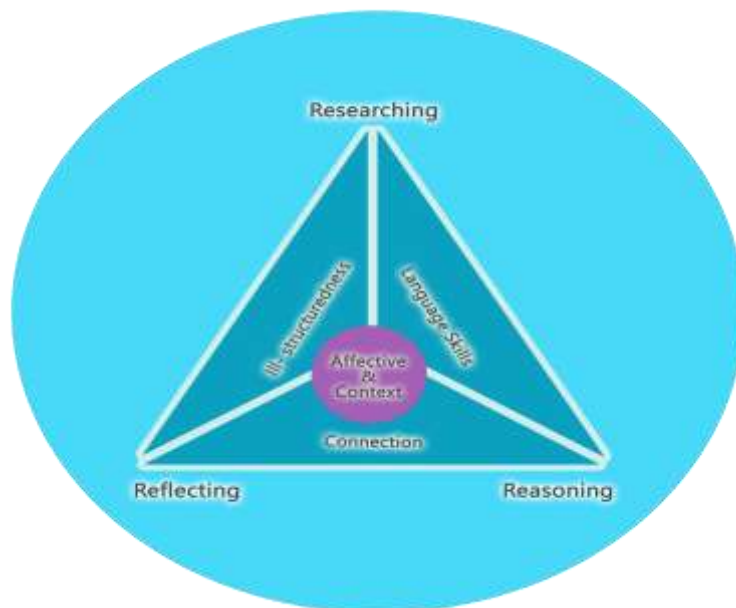
Fig. 2: The emerging PBL *Language* case-design model.

In conclusion, the practitioners' feedback on the trainings has provided important key points with regard to the element of ill-structuredness in crafting PBL Language cases/ problems and the emerging PBL Language Case-Design Model specifically for General English Proficiency course. Their responses are unique and crucial in view of the slight differences in case-design between language and content subjects. The convergence of new knowledge and flexibility experienced during these trainings yield a deeper understanding involving the issue of ill-structuredness for PBL language case-designs. Relatively, it contributes to a pertinent emphasis on the affective angle in the case-design procedure. The findings further conclude the importance of the emerging PBL Language Case-Design Model for language teaching and the valuable gains of the trainings in preparing PBL case-crafters to teach language using PBL cases. However, more conclusive studies might be needed before establishing the possible emerging model specifically for language subjects. Hence, the emerging PBL Language Case-Design Model is not only expected to guide English Language Practitioners with limited case-design knowledge, but also practitioners teaching other languages to craft PBL cases to meet their learners' language learning aims.

4 ACKNOWLEDGEMENT

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