The Essentials of a Problem-Based Learning Experience

I, brought up in an authoritative educational and political system in Taiwan, and habituated in being dominated, was truly a positivist. I deeply believed that “there is a reality out there to be studied, captured, and understood.” (Denzin and Lincoln, 2000). Such belief had enhanced my blind worship of idealism as truth building in the pursuit of reality. It also had indirectly fostered the belief that learning is the accumulation of those discovered facts and lawful relationships among the objects in the reality, and these representations of the reality are the knowledge that cannot be challenged. Therefore, information transmission was the focus of learning, and being receptive and diligent were the keys to successful learning. Such a learning experience had been an extremely passive and suppressed one. It was not until when I had my graduate studies in the States that I experienced dynamic interactions in classroom, tried to free myself from the fear of being disobedient, and began to ask questions from alternative viewpoints. And, it was then that I started to form my understanding and opinions, and to understand that “human beings do not find or discover knowledge so much as we construct or make it” (Schwandt, 2000).

I gradually persuaded myself that knowledge does not necessarily represent the true reality. Knowledge is the result of individual and collective interpretations of the true reality. Different intentions and social backgrounds result in the variations in understanding the world. Thus, knowledge can be challenged; learning should focus on “social, dialogic nature of inquiry” (Schwandt, 2000). Such an inquiry provides learners the opportunities to reexamine their interpretations and others’ interpretations of the world, and to reconstruct their own understanding in order to achieve the viability of their understanding in the interaction with the world. My own “set of beliefs and feelings about the world and how it should be understood and studied” (Guba, 1990) are more inclined to constructivist paradigm. Fosnot (1996) defined constructivism as a theory about knowledge and learning; the theory described both what “knowing” is and how one “come to know.”

“Based on work in psychology, philosophy, and anthropology, the theory describes knowledge as temporary, developmental, nonobjective, internally constructed, and socially and culturally mediated. Learning from this perspective is viewed as a self-regulatory process of struggling with the conflict between existing personal models of the world and discrepant new insights, constructing new representations and models of reality as a human meaning-making venture with culturally developed tools and symbols, and further negotiating such meaning through cooperative social activity, discourse, and debate.” (p. ix)

The emergence of research interest
I am aware that this constructivist view of learning and knowing is little by little shaping my own worldview. However, life experiences are full of contradictions. In one hand, through learning in a more interactive, student-centered pedagogical structures, I oppose more to the conception of objectivism that “reality is assumed to be external and separate from the knower” (Driscoll, 2000). On the other hand, through the practice of instructional design, which was deeply rooted in behaviorist and cognitive learning
theories, I still analyze knowledge as an objective reality. Moreover, the research in the field of instructional technology is dominated by experimental studies (Driscoll and Dick, 1999), whose endeavors are usually to investigate the causal relationship between independent variables, e.g. design of certain instructional components or strategies, and dependent variables, such learning outcomes or students’ attitude. Such endeavors are judged by the control of validity and reliability, which imply that there is an absolute reality out there that can be objectively measured and conceived. The contradictions between my own individual beliefs and my perceived underlying epistemological orientation that dominates in the ID practice and research puzzle me as well as challenge me. The puzzlement lies in whether those paradigms have to be excluded from each other in the field of instructional technology or whether the field can somehow accommodate those different paradigms and become multi-paradigmatic as Dill and Romiszowski (1997) proposed.

“Right now a great many new and older but revised paradigms are being introduced into the field… We believe this is a healthy situation, because it provides the instructional developer with new tools not previously possessed, and new ways of understanding instructional problems not previously available. We believe that with the new paradigms, current anomalies will fall to scientific advances, better theories will be developed, and practice will jump ahead in quantum leaps... There are difficulties, however, with the process as it is currently occurring. Many of the paradigms are incompatible, especially philosophically. But they are being accepted as technological alternative. Perhaps they can be practiced together, or alternately by the same person, but only by treating them differently than their internal structure would dictate... In the end, if the field become multi-paradigmatic, many of these paradigms will survive into the final mixture, come as general-purpose approaches to instructional development, some surviving only in specialized niches and for specialized application. Others will disappear altogether. Many years may be required for this puzzle to sort itself out fully.” (p. 23-24)

The challenge lies in what to do and how to do if there is adoption of a paradigm shift. The emergence of constructivist orientations in the field has resulted in a lot of dialogues and suggestions of alternative instructional-design theories (Duffy and Jonassen, 1992; Reigeluth, 1999). The focus of design of instruction in the constructivist paradigm has shifted from how to structure instructional events in order to maximize the effectiveness of information transmission to the development of learning environments that will facilitate students’ own construction of understanding the subject matter under study. The development of learning environments should be based on the principles, such as to embed learning in complex, realistic and relevant environments, to provide a social negotiation as an integral part of learning, to support multiple perspectives and use of the multiple modes of representation, to encourage ownership in learning and to nurture self-awareness of the knowledge construction process (Driscoll, 2000).

The emergence of constructivist orientations also challenges us to reexamine our own philosophical assumptions in research inquiry. Koetting (1996) identified the mainstream position on educational research as a systematic process of discovering the laws of nature in order to describe, explain, predict and control. To broaden the scope of educational research, he proposed that “doing philosophy is doing research”, and stated the ultimate purpose of doing research is “to gain a clear/clearer perception of reality and our
relationship to that reality.” (Koetting, 1996). His propositions made me to confront myself more critically: Where do I place my value of research? Should I value the hypothesis testing to verify what works in classroom or the naturalistic inquiry to understand what is going on in classroom? What should be my focus of research inquiry?

Some instructional methods have been viewed as constructivist one, whose learning environments emphasize both individual and social nature of knowledge construction. I am particularly interested in an instructional approach, called problem-based learning (PBL). PBL has been identified as a constructivist learning approach (Savery & Duffy, 1995; Jonassen, 1999; Driscoll, 2000). In the PBL approach, students are not exposed to a series of lectures, but to a series of problems. By engaging in problem solving in groups, students are responsible for generating their own learning issues, and the instructors become facilitators helping students identify what they need to know and the resource of the needed information. Thus, the implementation of this approach has changed the phenomenon of teaching and learning in classroom. Much of research in PBL has been focused on effectiveness of such changes (Norman & Schmidt, 1992; Albanese & Mitchell, 1993; Venon and Blake, 1993). The notion underlying this type of research is an evaluative one, which makes judgments on instruction in terms of the learning product, and implies the existence of subjective criteria. Although such research sheds light on the probability of usefulness of the PBL related to the learning outcomes as it is applied to instruction, it does not help us to understand how the PBL approach is carried out in classroom, and how the PBL approach influences the instructor and the learners in terms of learning as a social act and process. Moreover, it is the students and the instructors who live in the changes, but the inquiry in the experimental research seems to ignore that it should be their experience to tell. Thus, I would like to investigate the students’ and the instructors’ perceptions of their experience in the problem based learning as well as how students and instructors engage in and experience a problem-based learning environment. I want to take this chance to use a qualitative research approach to explore PBL from an angle different from its hypothesized effectiveness on learning. Also, I want to use this as a learning opportunity to understand both the research methodology by doing it, and to understand myself as a researcher by reflecting my own thinking process along the research.

**Problem-based learning experience as a phenomenon**

The instructional principles underlying PBL have been described in a constructivist framework (Savery & Duffy 1995), which particularly puts emphasis on learners as constructors of their own knowledge and social negotiation of meaning. Such an epistemological position brings learners into the spotlights: learners are empowered to determine their own learning issues and to enhance their understanding through interaction with others. Therefore, it is from students’ own perception of their lived experience of the problem-based learning environment that I want to draw attention to in my initial investigation of PBL. The guiding question for the research is “What does a PBL learning experience mean to the students?” The inquiry aims to establish a conceptual framework of what a problem-based learning experience means to the students.
This inquiry to students’ perception of their learning experience in PBL will be held in a higher education background, since it is the arena that I have been working in as an instructional designer. The inquiry intends to obtain a more comprehensive understanding of the way in which students perceive their learning experience in problem-based learning environment. Conducting a study of this kind might be beneficial for several reasons: (1) with a conceptual framework derived from what problem-based learning means to the students, we can re-identify the essential structures of PBL and examine what may facilitate or hinder students’ learning beyond the purely theoretical inference, and (2) through the process of doing the research, hopefully I can come up with better understanding of the various research methodologies in the research community, and confront myself to find out where I stand as a researcher.

**Historical background of PBL**

Problem-based learning was first developed in medical education at McMaster University in Canada in the mid-1960s. The key features of the PBL program at McMaster are: the analysis of problem as a way of learning, the development of self-directed learning, the use of small tutorial groups, and a faculty tutor in each group (Barrows, 1996). Problems were used as a stimulus for students to start the group learning process. Students reason through the problem and find out what they already knew and what they should know in order to solve the problem. It is through this active and reflective thinking process that students become responsible for their own learning. It is the application of their knowledge to the problem that students test and integrate what they learn. In general, PBL aims to motivate students to participate in the learning process and to help foster problem solving skills.

The major factors that initiated the implementation of PBL in the medical education at McMaster University include (Barrows, 1996):

- The dissatisfaction of the learners with the education
- The irrelevance of the learned information to the professional practice
- The learners’ lack of reasoning ability to apply what they have learned to solve problems at the work place.

The proliferation of PBL rises along with changes of demands on college graduates. Because of the explosion of the information and the needs of professional practices, students are expected to develop reasoning and problem-solving skills, to have high level of communication skills, and to be able to work with others.

The claims about its merits on enhancing students’ problem solving skills, integration of basic concepts, self-directed learning and higher order thinking skills have helped PBL has gained a lot of attention in higher education (Hmelo & Ferrai, 1997; Barrows, 1996; Savery & Duffy, 1995). Over the past three decades, PBL has been adopted in a variety of other professional schools, including architecture, business, engineering, forestry, nursing education, law, political science, social work, and education.
Review of Related Literature: Theoretical foundations and research

Finkle and Torp (1995) defined problem-based learning as “a curriculum development and instructional system that simultaneously develops both problem solving strategies and disciplinary knowledge bases and skills by placing students in the active role of problem-solver confronted with an ill-structured problem that mirrors real-world problems.” Flourishing in medical and professional schools on the curriculum level, the PBL approach has been adapted to be implemented for entire courses or to be used to teach certain parts of course. Rhem (1998), the executive editor of the National Teaching & Learning Forum, recognizes such changes in the implementation of PBL and states that generally advocates accept course long continuity. The scope of the PBL environment is on a course level. Samford University, awarded a grant from the Pew Charitable Trust to redesign key areas of the undergraduate curriculum to employ problem-based learning (PBL), defines PBL in her first issue of PBL Insight, as an instructional strategy. Similar to Finkle and Torp’s definition, this definition emphasize meaningful learning through solving a contexualized, ill-structured problems; different from Finkel and Torp’s definition, the scope of PBL is shifted from a curriculum level to a course level. In this paper, the investigation will focus on the PBL environment on a course level.

The underlying development and design principles of PBL reflect how people usually solve problems in their everyday lives. In education, PBL has the power to create a problem-anchored learning environment to take up this natural process of inquiry to pursue and use knowledge. Scholars have identified the theoretical foundations of PBL both from the cognitive construction and socio-cultural theories (Schmidt, 1983; Savery & Duffy, 1995; Camp, 1996; Hmelo & Evensen, 2000). The problem as a driving force of the learning process can be explained in Piaget’s concept of equilibration, a cognitive construction process as a learning mechanism, which includes assimilation and accommodation. The assumption is that when the cognitive structure is disturbed, it will assimilate and accommodate to generate new structure because of the human’s self-organization tendency. The problem in PBL serves as anomalies of experience creating a state of disequilibrium (Piaget, 1985), which can only be resolved until a new cognitive structure is adopted. Also, Vygotsky’s sociohistorical development psychology (1986) provides a theoretical grounding for social negotiation of meaning as important part of the problem-solving team structure. Vygotsky explored the dialectic process between the individual and society, and the effect of social interaction, language, and culture on learning proposed. He believes that human mental activity is a particular case of social experience. Thus, an understanding of human thinking depends in turn on an understanding of the mechanism of social experience; the force of the cognitive process deriving from the social interaction is emphasized. Group problem solving process in PBL provides a framework for social interaction, which subsequently is transformed into an internal mental process.

The PBL approach has been claimed to align with the constructive nature of cognition, i.e. knowing is an active, constructive process – an interaction between the individual and the environment (Savey & Duffy, 1995; Greening, 1998; Jonassen, 1999). In other words, the nature of knowledge is individually constructed in a social context. It is through the constructivist viewpoint that the PBL environment intends to emphasize the following
conditions of learning: (1) to establish the relevance to student’s interest: students are given power to choose their own learning issues related to their own needs in PBL so that they can develop a favorable disposition toward such learning experience, (2) to encourage students’ collaboration with other group members: PBL provides a learning experience that challenges students to incorporate different perspectives and values to pursue understanding of concepts and rules by engaging problem solving, and (3) to support autonomous self-regulated learning: In a PBL environment, the relationship between students and teachers is a collaborative one based on mutual respect instead of authoritative respect in which knowledge is passed down from teachers to students; students are responsible for their own learning.

Over all, the value of PBL is seen in its aim to motivate students to participate in the learning process so that students are able to improve their problem-solving skills, integrate basic concepts, and foster self-directed learning and higher order skills (Norman & Schmidt, 1992; Barrows, 1996). This positive view of PBL has elevated a lot of research studies on PBL investigating five major issues: Does PBL work? What are the impacts of PBL on students’ thinking? What elements in the PBL environment make instruction or learning experience successful or unsuccessful? What is the structural model of the problem-based learning process? What is problem-based learning experience?

Four lines of research are delineated as follows. One is to evaluate the effectiveness of PBL on learning outcomes (Albanese & Mitchell, 1993; Venon and Blake, 1993; Norman & Schmidt, 1992). These studies have shown mixed results. Norman and Schmidt (1992) examined several sets of experimental evidence in medical education, and concluded that there was no evidence that PBL curricula resulted in any improvement in general, content-free problem-solving skills, but it did support some of the general goals of PBL, such as retention of knowledge, transfer of concepts and integration of basic science concepts. Two meta-analysis studies of evaluative research (Albanese & Mitchell, 1993; Vernon and Blake; 1993) also could not reach conclusive results on the superiority of PBL comparing problem-based learning with the traditional instruction.

Another line of research is to explore the influence of PBL on students’ cognitive process and perceptions of the PBL learning process (Van Til, Van der Vleuten and Van Berkel, 1997; Rahimi, 1995; Hmelo, Gotterer, and Bransford, 1994; Ryan, 1993). It is the qualitative changes in cognition and learning process that the researchers are interested in. For example, Hmelo, Gotterer and Bransford (1994) compared the reasoning strategies, coherence, learning self-assessments and learning plans of 20 medical students in an elective class in PBL with those of 20 students in the non-PBL group. They found that “PBL students were more likely to use hypothesis-driven reasoning in their explanations than non-PBL students.” Also, they examined the patterns of learning issues and learning plans generated by students to assess the impacts of PBL on self-directed learning. On the other hand, Van Til and his colleagues (1997) explored student perceptions about both the value of and their ability to carry out self-directed learning as to identify (1) whether students within a problem-based learning course perceived as important the ability to be self-directed learners, (2) whether this perceived importance
changed over time through the course, and (3) whether students’ perceptions of their abilities to be self-directed learners changed over time through the course. The students were asked to rate the perceived importance and perceived ability related to self-directed learning objectives on a scale of 0-6 on three occasions through the semester. The data indicated that the perceived importance and perceived ability of self-directed learning increased throughout the semester. However, this kind of one-group pretest-posttest design may show change, but whether such development owes to the influence of the problem-based learning environment cannot be determined.

The other two lines of research examine a relatively extensive context of PBL. One is to describe the design, implementation and evaluative processes of adopting the PBL approach into the classroom. Boud and Feletti’s *The challenge of problem based learning* (1997) includes case studies in different academic fields. The purposes of those studies are usually to share their learned lessons by telling their experience of applying PBL in a specific context, and to identify important factors promoting or impeding success of PBL by analyzing attitudes and opinions of the faculty and the students.

The other is designed to develop a structural model or discover patterns about problem-based learning. The research methods to uncover the structures and patterns can be either quantitative or qualitative. For example, Van Berkel and Schmidt (1999) used path analysis to test a hypothesized model of the problem-based learning process incorporating the variables such as amount of prior knowledge, quality of the problems, tutor performance, small-group functioning and time-spent on learning, intrinsic interest in subject matter and commitment. On the other hand, the qualitative analysis of observations, videotaping of the group work sessions, and interviews were used to investigate the structure of the learning process or patterns of group interaction in problem-based learning classrooms (Evensen and Hmelo, 2000). Here is another example of a qualitative study of problem-based learning. Savin-Baden (2000) looked into the perspectives of those who were involved in problem-based programs and developed a framework of “three interrelated sets of concepts emerged from people’s experience of problem-based learning.” It is through the examination of the nature of the learning experience in the context of different PBL environments that the researcher wants to reveal a holistic view of the interaction of the various components in learning. This intention is best described in her own explanations of why she termed the framework ‘Dimensions of Learner Experience’:

“I have termed this framework ‘Dimensions of Learner Experience’ to encapsulate the idea the learners do not just engage the pedagogical components of themselves in learning. Students do not simply learn the thing they are studying at the time, they also learn about people, contexts, likes and dislikes, and most importantly themselves. Learning is not a linear process whereby students who are engaged in learning are just thinking about that subject, in that context, at that particular time. Learning is about engaging different dimensions of ourselves in the learning process.” (p. 54-55)

Savin-Baden’s viewpoint, along with the mixed results and analyses of the research on PBL, leads me to see that the complexity of learning, and that no instructional approach
is inherently effective. The inclusion of all the pedagogical components in a theoretically sound instructional approach is essential, but it does not guarantee the success of its implementation and the positive effects on learning. Thus, the complexity of the phenomenon, such as learning, seems to make the experimental research pointless and unreachable, which focuses the control of variables in the instruction and aims to discover a lawful relationship between the instructional components and learning outcomes. In order to further understand an overall picture of the problem-based learning, the investigation should encompass different aspects of PBL: the actors (instructional designers, instructors, and learners), the actions (instructional design, teaching, and learning), and the interactions. This study, with a phenomenological focus, i.e. “getting at the essence of the experience of some phenomenon” (Patton, 1990), intends to start with the investigation with descriptions of the learning experiences from the learners’ perspectives, especially perception of their role as a learner and of the situational elements in the PBL environments.

Research Methodology

The purpose of the present research is to identify a conceptual framework to describe the lived experience of the students in a problem-based learning environment. Thus, the phenomenological inquiry is particularly appropriate to address meanings and perspectives of research participants. In other words, this research aims to know people in their contexts, and to understand how they saw themselves and their experience in relation to problem-based learning. The major concern of phenomenological analysis is to understand “how the everyday, inter-subjective world is constituted” (Schwandt, 2000) from the students’ perspective. The goal is to identify essence that underlies all the variations of students’ descriptions of PBL as a learning phenomenon. The basic philosophical assumption underlying this inquiry has most often been illustrated by Husserl’s (1962) statements – “we can only know what we experience.” Thus, any inquiry cannot engage in ‘sciences of facts’ because of there are not absolutely facts; we only can establish ‘knowledge of essences’. The essence is the commonality that is shared within the different lived experiences.

Thus, without probing the perceptions of students, the investigation of their experience of the problem-based learning environment in the classroom would be based only on my speculations or her inferences of other theoretical assumptions. If I am interested in students’ perceptions of their experience in the problem-based learning environment, I should first look into the individual point of view, i.e. the realization of subject consciousness perceived in the objects, to get to understand human phenomena as lived and experienced, which Giorgi (1985) pointed out as the major characteristics of a phenomenological psychological method. The major data source for this inner perspective is interviewing. Patton (1990) stated the purpose of interviewing specifically as “to find out what is in and on someone else’s mind”, and that is exactly what the target of the phenomenological study focuses on, i.e. the perception of lived experience.

There should be two perspectives of phenomenological analysis of the perception of lived experience: from the people who are living through the phenomenon, in this study, the students; and from the researcher, whose has great interest in the phenomenon. In order to
‘return to the things themselves’ (Husserl, 1970), the researcher cannot impose the meanings for the students because they are the absolute sources of their own existence. However, it seems to be impossible to detach personal interpretations from the things that are personally interesting. Thus, the researcher has to be aware of his or her own experience being infused into both my engagement in the interviews and the analysis of data. This study aims to describe the meanings of the PBL experience for the students.

Procedures: entry to the field
Through the instructional design community on campus, I reviewed several possibilities of college-level courses that have been under a redesign process in a problem-based learning approach, and to identify an appropriate site for me to recruit participants. Barrow’s six original characteristics for the PBL model (1996) were used as criteria examining the pedagogical structure of potential courses: learning is student-centered; learning occurs in small student groups; teachers are facilitators; problems form the original focus and stimulus for learning; problems are vehicles for the development of problem solving skills; new information is acquired through self-directed learning. Because problem-based learning is an instructional model (Savery & Duffy, 1995) that can be used to structure the development in the curriculum level or course level, it is worth mentioning that the PBL environment under the present study is on the course level, not on a curriculum level. The choice lies in the fact that innovation in a curriculum level on campus is limited. Also, the study constrains its investigation within one course. Hopefully, limiting the study to a single course may energize the study’s vigor in extensive descriptions of the contextual elements in a particular course.

After several contacts with the instructional designers and the instructors, a course was targeted as a PBL environment under investigation for the correspondence of its instructional principles to PBL, and the availability of the access to students. The course is an experimental course, which was driven by the needs of integrating different disciplines involved in food product development, such as food science, retailing, and marketing. The course description presented to students on the web page is as follows: “In this environment the student will be immersed in a problem-based learning experience designed to further develop critical thinking, problem solving, team decision making, and communication skills in the context of industry’s approach to developing new and improved food products.”

However, the course has undergone different stages since its first offer in 1998. The driving force that Although the underlying instructional principles stayed the same, the activities that students engaged in, the resources that students were provided, such as cases and the experts in the food industries, and the group dynamics that students experienced, such as numbers of the students, were different in each implementation. The specific learning environment that was under investigated was implemented in Fall, 2000.

Based on the conversation with the instructional designer of the course, who had been working on the development with the faculty since spring, 1998, the biggest change in Fall, 2000 was the collaboration across campus. Before, this course worked with students in another university, whose backgrounds were more marketing-oriented. Students on
both campus shared the same presenters from the industry, and they also made presentations to each other via pictel. But, in Fall, 2000, not only did they share the same syllabus, and follow the same course progress, they also collaborated with students across campus on their project of developing a food product based on an initial marketing opportunity statement.

During the semester, students would work on a short case for three weeks and then work on an industrial food product development case study, in which students examined a new product opportunity statement and prepared a comprehensive plan for developing the product. In order to develop the product, students were to go through a series of procedures, e.g. marketing research, consumer reports, focused group, and surveys, and to present their carry out the procedures: research, marketing research, consumers, focused group, and survey. Students were also given presentations from the experts in the industry as sources for the food development.

**Procedures: Data sources**

It is from students’ own perceptions of their lived experience of PBL environment that I want to obtain my analysis of the essences of PBL. Therefore, one-to-one in-depth interviews are used throughout the study as the method of data collection. Two students who took the PBL course in the Fall of 1998 were recruited through the introduction of the course instructor designer. First, the students were asked a broader about their academic background, such as their major, the year they are in the program, and their career goals so that I could identify any specific factors that influence students’ interpretations of their learning experience in this particular course. Also, students were asked to (1) give their own description of the course, (2) to describe their learning experiences from different aspects of the learning environment: the tasks, the activities, the instructor, and the structure of the course, (3) to evaluate the course, and (4) reflect their own learning. The purpose of this interview was to allow the researcher to hear students’ voices about their learning experience, particularly as it reveals their opinions about the tasks, the activities, the instructor, and the structure of the learning process.

Also, in order to explore different communicative modes of getting students’ responses, a list of questions were sent out via email. The underlying assumption was that students could have more time to reflect and to give more elaborations of their experience in writing. Also, I took this chance to compare the verbal and written replies from the students and examined the consistency of their perceptions. Moreover, I interviewed one of the major instructional designers to get a better picture of the course in context so that I could establish my basic understanding of the course in order to prepare myself to interview the students as well as to enrich comprehensive descriptions of the context later in the write-up. Documents, such as syllabi and written description of the assignments, were planned to be obtained, but due to access issues, the information about the context of the course were basically solely from the descriptions of this particular instructional designer, who participated the instructional design process since the beginning of the conceptions of the instructional change in 1997, and involved in the redesign process.
through observations and participations in group activities continuously from 1998 to 2000.

Data Analysis
The focus of a phenomenological study according to Patton (1992) lies in the “descriptions of what people experience and how it is that they experience.” The goal is to identify essence of the shared experience that underlies all the variations in this particular learning experience. Essence is viewed as commonalities in the human experiences. In order to search for those commonalities, Patton (1992), based on Doglass’s and Moustaka’s work (Douglas and Moustakas, 1984; Moustakas, 1990), proposed the seven steps for phenomenological analysis:

1. Epochè phase: the researcher has to recognize personal bias, and take a fresh look at the stated experience.
2. Phenomenological reduction: this is a “bracketing” process, which involves a close examination of the meaning and interpretations of the data in order to use the identify recurring features to describe the phenomenon under investigation
3. Organize the data into meaningful clusters
4. Eliminate the irrelevant, repetitive or overlapping data
5. Identify invariant themes within the data
6. Provide the textural portrayal of each theme
7. Develop a structural analysis that reveals the essence of the experience.

The entire analysis process aims to examine the lived experience from the ones who produced the experience rather than imposition of a researcher’s own interpretation. It should be the interpretations of the learners that define the commonalities of the learning experience in the PBL environment. It is not my own thinking of PBL, not the other researchers’ experience of PBL, and not the theoretical descriptions of PBL that are under examination. It was a quite challenge because I have immersed myself in the literature about PBL before I started to engage in this research. A lot of presumptions exist. I noticed that even during the interviews, I was putting the following labels to the learners’ responses in head. Then, when I went back to look at the transcriptions, those terms still led the analysis. It was hard to see those data purely from the learners’ interpretation. What I ended up doing was that I tried to list the pre-conceptions about the instructional components in the PBL, i.e. authentic, complex problems, active learners, collaborative learning, faculty as facilitators or guides, and learning resources. For example, in terms of collaboration, I had four assumptions about the collaborative structures from readings (Faidely et al., 2000): collaboration distributes the cognitive load among the members of a group; collaboration results in group’s distributed expertise; collaboration enhances reasoning and higher order thinking with challenge of different perspective and collaboration facilitates self-examination. What I tried to do next was to see if there were any descriptions reflecting my own assumptions, and tried to explore whether there were other ways to interpret the data. The process was meant to build up an initial conceptual framework to interpreting data.

Based on the data I gathered from the interviews, there are several possible themes emerged: usefulness, distribution of knowledge, and self-realization. Usefulness is
identified in the students’ descriptions of the value of this learning experience. In the interviews, both students have expressed how the realistic aspect of the project provided useful learning context for their future career. Both of them valued this learning experience. One emphasized the value more from the understanding of subject matter “I felt the course was very useful in integrating information from previous courses…This course showed us how this information is used in the work force to make strategic decision”; he also made comments on how this course opened his eyes to all the different costs and processes involved in food development. The other put the value of this course on how to work in group and described it as a great learning experience: “And I have a final group project now. And I’m not making some mistakes that I made before last semester because what I have learned. And I really think it was helping me. And I’m seeing, as I’m looking from the outside at my group members now, they think I’m complaining a lot and seeing us not get anything done but because I had retrospective experience I felt like that I had to get across what is going on and how to handle it so it doesn’t get worse.”

Another theme seems to repeatedly appear from their reflection of their experience is the distribution of knowledge. The integration of the course content really made them think about different disciplines in the food industry. One of the students talked about one of the course objective. She said, “Another objective was to learn firsthand from industry speakers that would come in and talk about: ‘OK, my experience is in marketing’ and ‘My experience is in packaging,’ and ‘My experience in ingredient suppliers.’ They would come in and talk to us, and give us PowerPoint presentations on what their company does, how we can utilize them later when you have a career in the industry. And how everything all fits together.” However, such distribution somehow caused a feeling of alienation. When she talked about working on the group project, she made the following statements: “Because I was not a business person, the jargons made no sense to me.”; “One of them would always be science; the other five would be business. I always got the science part. I would do my research on the science part. So the business that I never did research on.”

Learning means to bring changes into learners either cognitively or behaviorally. However, not every learner is able to be sensitively aware such changes in themselves and transform such awareness into a power of understanding themselves better. Through a preliminary analysis of the descriptions of the learners, a sense of self-realization come into view in this particular learning experience. One of the students had expressed the effects of this course on her: “As I mentioned before my career I’m hoping to go into is Heinze. But, my goal is to go into sales, which I have no experience in sales and is all business-related. After I took the class, I felt like it gives me the confidence to ask my questions and I would be able to learn my mistakes. And not I’d be able to jump into sales, but I’ll be able to use the resources around me because I had the experience and because of the confidence after I took a class like this.” The other learner also made comments on how taking this course sparked his interest in food industry, probably marketing rather than food development, and he was very aware of the structure of the course as a problem solving process helped his learning specific new concepts and people skills.
**Verification**

Different from the criteria of validity or reliability to judge the quality of the quantitative studies, qualitative researchers adopt the notion of multiple, constructed realities in postpositivism, accept the postmodern sensibilities, capture the individual’s point of view, examine the constraints of everyday life, and secure rich description (Denzin and Lincoln, 1994). The focus of research lies in understanding and meaning. The issues for qualitative research become transferability, faithfulness, and dependability. The job of qualitative researcher is to give thick descriptions so that readers are able to make decisions to see whether the results of the inquiry are transferable. The conceptual analysis must be faithfully derived from the data and be checked out against the consistency of different data sources. Moreover, because the meaning of communication depends on knowing the relevant context, and contexts are consciously designed to evoke multiple meanings (Dye, 1998), qualitative research must develop thorough and comprehensive descriptions of the context. With trustworthiness, it is important for researchers to pose the questions about neutrality: How can one establish the degree to which the findings of an inquiry are determined by the subjects and conditions of the inquiry and not by the biases, motivations, interests or perspectives of the inquirer (Lincoln and Guba, 1985)? It does not mean that there must be exclusion of presuppositions. Rather, qualitative researchers need to recognize their thoughts as an inalienable factor that guides their interpretation. The recognition of the inevitability of subjectivity also yields the process of triangulation that utilizes the use of multiple sources, methods, investigators, and theories (Creswell, 1998, Lincoln and Guba, 1985; Patton, 1990) to ensure the credibility of the research.”

**Reflection**

During this research process, I have kept asking myself whether I was doing a phenomenological study. However, it is not until the stage of analysis and writing up that I detected my misconception of phenomenological studies. I have identified several definitions of phenomenological studies (Patton, 1990; Creswell, 1998; Rossman & Rallis, 1998). I think Cresswell (1998) gave the simplest definition:

“**This type of study describes the meaning of experiences of a phenomenon (or topic or concept) for several individuals. In this study, the researcher reduces the experiences to a central meaning or the “essence” of the experience (Mousetakas, 1994)”** (p. 236)

Before this inquiry and during the inquiry, my understanding of the phenomenology focused on two concepts: perception and phenomenon. Somehow, I totally shut off the most important concept from my thinking, i.e. the meaning of the lived experience, which appears over and over in the readings and even in my own description of this study. I focused on “perception” because it connotes “meaning” from the participant’s perspective; I focused on “phenomenon” because it indicates the topic and concept that I am interested in. I thought if I look into the meaning of the perception of a certain topic, or concept, then it is a phenomenological study. This misconception reflects in the first title of this paper, that is, the essentials of a problem-based learning environment. I realized now that as an instructional designer, my real intention does not lie in understanding what the PBL experience means to students, but is the application of such
understanding. What I really care about is how instructional design can utilize such understanding to develop a better PBL environment. The real intention is twisting my understanding of phenomenological studies, although the purpose of this study aims to describe the understanding of the meaning of the PBL experience and such understanding is the appropriate means to the ends.

Under my misconception, I could interview the students who have heard about PBL, but never experienced it. I could ask students who experienced PBL, but only ask about what they think of this PBL experience in terms of effectiveness without probing what the PBL experience really means to them. It is through this inquiry process, I started to grasp what phenomenological study really is, and examined and examined my own intention and my own value about this research.

Another thing that has been in the back of my mind is the context. The context information I got was from the instructional designer, the descriptions of the course on the web, and the interviews from the students. I felt that without observing the class, I could not have the sense of what the course looked like, and thus, I couldn’t provide rich context for the readers. Also, if we view perceptions as reflections of the actions, we have to observe the actions in context in order to examine to what extent the perceptions reflect the actions, and in order to see the meaning of the interpretations.

My experience as an instructional designer has somehow overpowered me during the research. Because I employed a format of a semi-structured interview in order to leave flexibility to ask the learners to elaborate some points that arise in the interview. However, I kind of abused the flexibility. The interview somehow led me to take a program evaluation approach, i.e I pressed questions such as what are the advantages or disadvantages of the course. Students seemed to talk about more the problems they encountered. It seemed that I violated the principle of the interviews. I did encourage students to express what was salient in their experience in their own terms, but I forgot to avoid dictating the structure of the response. Polkinghorne (1989) proposed five questions that researchers might ask themselves to judge a phenomenological study. I felt I truly violated the first one: “Did the interviewer influence the contents of the subjects’ descriptions in such a way that the descriptions do not truly reflect the subjects’ actual experience?”

While I was transcribing the conversations, I noticed that I had the tendency to make comments to judge the situations that the interviewee was describing and got off the tracks of the interview. Even the interviewee sensed it and kept asking me “Do I answer your question? Is that what you want to ask?” What I learned from this is that besides a list of major open-ended questions, I should develop a list of questions that I should avoid to get into. Also I have to make sure that the only reaction that I should response to what the interviewees say is to ask them to elaborate or explain what they just said instead of imposing my judgment or talking about my own life experience to influence them.

Another downfall of mine that I found during this inquiry process was the planning part. I did not lay out all the processes that I had to go through, especially in arranging the
interviewee’s verification of the transcriptions and my interpretation. Without such planning, I did not try hard enough to keep in touch with the interviewees for future contact. I did not develop any timeline for each process either.

Patton (1992) stated the distinctiveness of a phenomenological approach is the assumption that “there is an essence or essence to shared experience.” He further described that the essences are commonly experienced core meaning through a phenomenon. In the phenomenological approach, “the experiences of different people are bracketed, analyzed, and compared to identify the essences of the phenomenon, for example, the essence of loneliness, the essence of being a mother, or the essence of being a participant in a particular program” (Patton, 1992). My big question lies in the definition of essence. If essence is revealed in the commonality, then this notion should be challenged and we should give it more thoughts. The objects and the perceptions of the objects can be manifested differently on one level or category, but still share the same structure, process, or function on another level or category. Thus, the conception of the commonality becomes ambiguous. Also, if the pursuit of meaning is only defined on the commonality, it lacks or it is contradictory to the essence of the meaning. It is the different interpretations and different perspectives that enrich the understanding of the phenomenon and reveal the essence of the phenomenon more than ever. It is not the universality that a qualitative researcher is after, but the multifaceted manifestations and varieties perceived in the world make the inquiry fascinating.

Reference:


