

Revisiting learning in a constructivist classroom: A phenomenography through photovoice


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Abstract

The paradigm of 21st century education opens opportunities to look at constructivist classrooms where learning is active, collaborative, and, most importantly, reflective. This study describes learning from the perspective of students in higher education. This is a phenomenographic research study that incorporates photovoice, a reflective method introduced by Burris and Wang in 1992. Photovoice was used as a pedagogical tool in the classroom to facilitate substantial reflections using digital photography. It explores a variety of descriptions evident in photos and reflections of students. To generate general descriptions of learning that are reflective, participants made reflections and analyzed their perspectives. Students described learning as an experience, a goal, a process, and an expression. Recommendations on becoming a constructivist teacher are given.

Keywords

constructivist classroom, reflection, reflective learning, phenomenography

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Introduction

In today's increasingly complex life, students are challenged to have reflective and innovative skills to meet demands in higher education. In a constructivist classroom, the learning environment is described as highly engaging, student-centered, and democratic. Teachers are trained to be facilitators who invite students to explore, discover, and responsibly discern for their own constructed learning. Learning episodes are created to challenge autonomous learners. In this perspective, teachers use multiple approaches to become successful in providing assistance for students to construct knowledge.

However, most essentialist teachers are challenged on how they could effectively deliver both the process and the content knowledge in a constructivist classroom because such a classroom focuses on the students' construction of their own learning. To reconcile this, according to Brooks and Brooks (1999), first, the students should be provided with the opportunity to present their concept prior to the teacher stating what the concept is. Hernandez-Willemsen (2012) added that the mind is like a rhizome, with its interconnection of knowledge and skills. She concluded that in a constructivist point of view, to build an understanding of a concept, the learner must be involved in constructing the concept.

Constructivist pedagogy empowers students to create their own meaning and understanding. Becoming

a constructivist teacher is a call for innovation and creativity inside the classroom. Thus, the teacher has to maximize the use of available technology to improve the capability and move the imagination of the students.

Reflection plays a huge role in today's education. It greatly involves critical thinking, which is essential to learning. Reflection and reflective learning in the course of teaching may be used interchangeably. The objectives of this paper are to provide a description of learning and to present an overview of how phenomenography can be incorporated in teaching and learning in higher education.

Reflective learning primarily involves reflection. King (2002) describes reflective learning as a process of looking back at how a learner performed and how they make sense of what they were thinking the moment they acted, what occurred, and what they learned from the experience, storing these to guide them in handling things better the next time. It is a process of thinking about thinking wherein learners examine their thinking processes, beliefs, values, and understanding (Sellars, 2014). Learning Development (2010) posited that reflecting leads to finding patterns and associations in one's thinking coming from one's experiences in life and learning.

Figure 1 describes Kolb's (1984, as cited in Park & Son, 2011) model of experiential learning. It shows the four stages of the learning process in a circular course. First, the learner would have a concrete experience that

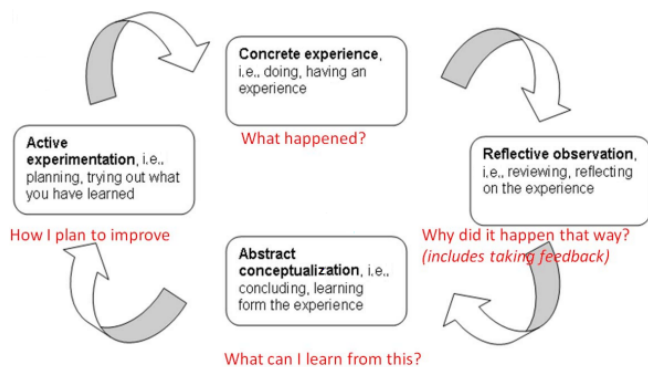


Figure 1. Kolb's (1984, as cited in Park & Son, 2011) model of experiential learning

would transfer to the second stage, reflective observation. After reflecting on the concrete experience, they would move to abstract conceptualization where they would create a conclusion extracted from the reflection of the experience. Then, they would move to the fourth stage, active experimentation, where they would test the new knowledge, leading them back to the first stage. From there, the learner may create new concepts from the new concrete experience and modify the learning, or apply the concepts to similar cases.

Materials and methods

The scope of phenomenographic research is focused on learning in higher education. Marton, Hounsell, and Entwistle (1984) stated that in phenomenography, the data is created directly from the learners through written responses, interviews, and even drawings or self-reflection. They shared that the content and setting should be those actually involved in learning which focuses on the experience of learning from the student's perspective and is based upon a phenomenological approach to research.

Marton et al. (1984) stated that in phenomenography, certain principles have to be ascertained: (a) the researcher should define the phenomenon of learning by extracting it directly from the learners' experiences, and (b) the process of learning has to be done in a natural situation which involves real content and settings. These two principles were used as guides in the data collection procedure of this study.

In phenomenographic research, the understanding of the studied occurrence may be extracted in "pre-reflective and conceptual thought," Barnard, McCosker, and Gerber (1999) stipulated. This type of research aims to expose certain differences in understanding from each respondent's perspective the ways of experiencing the phenomena. In addition, this utilizes a "second-order perspective" where the experience stays on the descriptive level of participants' understanding, and the study is presented in a unique, evidence-based manner.

In the same line of thought, Walker (1998) added that this is the essence of phenomenography, presenting not just the collective thought on the occurrence but also the variations of the ways each respondent experienced it and created concepts about it. To find and present the variations in a well-defined method would complete the definition of the phenomenon.

Phenomenography, the researchers' chosen method, is usually confused with phenomenology. To set things clear, in a phenomenological study, the phenomenon per se is investigated; in a phenomenographic study, the researcher investigates how (a group of) people view or understand the phenomenon. In this study, the researchers aimed to explore ways and processes of understanding constructivist learning through photovoice, a case of phenomenography, instead of seeking varied definitions and meanings of the phenomenon, constructivist learning, as in phenomenology.

Wang (1999, as cited in Schell, Ferguson, Hamoline, Shea, & Thomas-Maclean, 2009) defines photovoice as a "process [by] which people can identify, represent, and enhance their community through a specific photographic technique." Photography can be employed as a way to understand a concept or present an understanding of a concept (Gibbs, Friese, & Mangabeira, 2002, as cited in Schell et al., 2009). Schell et al. (2009) used photovoice as a learning tool inside the classroom, saying that Bagley and Cancienne's phrase 'voices of imagery' is "an appropriate way to describe our [Schell et al.'s] unique work with photography that bridges some of the gaps between teaching, learning, and research in the context of visual methods" (p. 340).

For this study, the researchers used phenomenography with a combination of digital photography and reflective process. Owners of the photographs were asked to represent their point of view by reflecting on the guide questions, taking photographs, and making deeper reflections on their photos. The researchers reflected, analyzed, and made recommendations on the significant themes from the photovoice session convened specifically for the sharing of participants' reflections.

Participants

The study focuses on the description of learning based on the photo reflections of two sections of second-year students from the College of Education of First Asia Institute of Technology and Humanities taking the course Theories of Learning. The two classes were handled by one of the researchers during the first semester of academic year 2015–2016. The photo reflections of the students were exhibited and the researchers asked the whole student population of the College of Education to vote for the photo reflection that adheres to their own reflection as to how learning is described. Of the fifteen students whose photos were chosen, only twelve

responded to the invitation to participate in the study. The twelve students were 16 to 18 years old and resided in Tanauan City, Batangas or nearby areas. Most of the respondents were female. Willingness and parental consent were the criteria in the selection of participants.

Data collection procedure

The data were collected using the following steps:

1. Introduction of photovoice. Photovoice (its meaning, origin, and purpose) was introduced and explained to the students as a process for research.
2. Photography lesson. Digital photography was taught in class. Guidelines in taking photos and the ethics of photography were discussed. Sample creative shots by the researchers were shown.
3. Motivation and preparatory discussions. The students were prepared for preliminary discussion on constructivism through different examples of photos happening in a classroom.
4. Reflective writing and photo shooting. Students were given two reflective guide questions: “How do I describe learning? Why is it important to reflect on my own learning?” They were instructed to use simile in writing their two-sentence reflection. They were then asked to creatively take a photo that depicts the description expressed in the reflection.
5. Final output. The layout of the original photo and its caption were customized using the piZap online photo editor.
6. Exhibit and selection process. All photo reflections were exhibited at the Atrium of FAITH. All students from the College of Education were asked to vote using the guide “To which photo reflection do I adhere with?” Fifteen photos were chosen.
7. Photovoice session (Reflection writing/focus group discussion). Of the fifteen participants whose photos were chosen, twelve accepted the invitation to join the study. They participated in the photovoice session and were convened for reflection writing.

The participants were instructed to take ten minutes to reflect on the photo they took and to write and reflect on their answers to the guide questions: “Describe the photo and its caption. How do I describe learning? How is it related to my own learning?”

The participants were given time to show their photos and share their individual answers to the given reflective questions.

Data/mode of analysis

This study explored, described, presented, analyzed, reflected on, and interpreted the photographs and reflections of the participants in expressing their experience of reflecting on their own learning. Figure 2 illustrates the

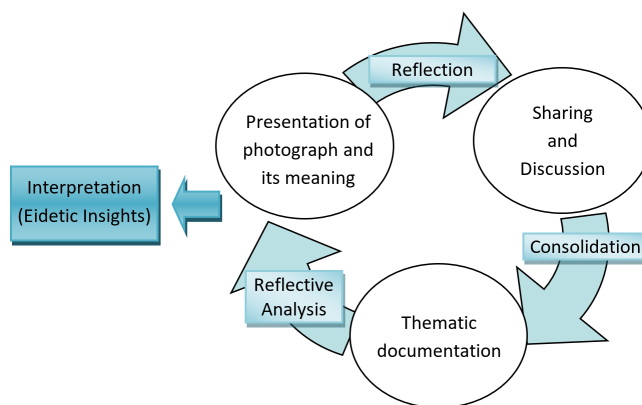


Figure 2. Process of doing reflective analysis and interpretation

process where the researchers and the participants contemplated on the themes discovered and shared eidetic insights.

The process of doing reflective analysis started with the presentations of the chosen photographs with the group, writing of reflections, sharing and discussions of the photo reflections, and consolidation of the shared reflections. From the consolidated reflections, the researchers proceeded with thematic documentation, which included the consolidation of the significant and relevant themes from the photo reflections. It was followed by the reflective analysis supported with the related readings from different sources. The eidetic insights came from the reflective analysis of the thematic documents and interpretation.

Results and discussion

Table 1 shows the chosen photographs, the captions written by the participants, and significant thoughts behind the photo. The captions state the answers to the guide questions: “Describe the photo and its title. What is the real story this picture tells? How does this photo relate to your own learning, specifically in higher education? Why is it important for you to reflect on your own learning?”

The participant who took Photo 1 (Participant 1) compared learning to her feet. She stated that the photo tells how she sees each of her achievements as footsteps towards her dream. She added, “learning helped me reflect and make realizations towards the fulfillment of my dreams.” For her, learning is important in becoming competitive and courageously achieving dreams. It is a treasure and indeed a lifelong process.

Interestingly, one participant related learning to the process of writing as seen in Photo 2. She further stated that by writing she can adapt to what is written. “It is easy for me to know the purpose of why I need to write—so I can easily catch up. By writing, I can easily adapt to the lesson. I chose writing for me to freely express my

Table 1. Presentation of photographs

Photo 1.
 "Learning is like my feet. It could take me to places."

Photo 2.
 "Learning is like using a pen. It allows me to write my own ideas, perspectives, and story in life."

Photo 3.
 "Learning is like a growing plant. It allows me to develop through time."

Photo 4. "Learning is like having a passport. It allows me to leave the world of curiosity and enter the world of knowledge by following and taking the right process."

Photo 5. "Learning is like farming. It allows me to harvest and how much efforts I've made will determine how much crops will I get."

Photo 6. "Learning is like stairs. It is a step by step process for me to learn and leads me to experience how to reach the top."

Table 1 (continued).

Photo 7. "Learning is like playing guitar. I cannot play a good song if it is out of tune. Like in learning, I can't have the knowledge if I do not let myself to be tuned up to be able to learn. If at first I don't succeed, I will try and try again."

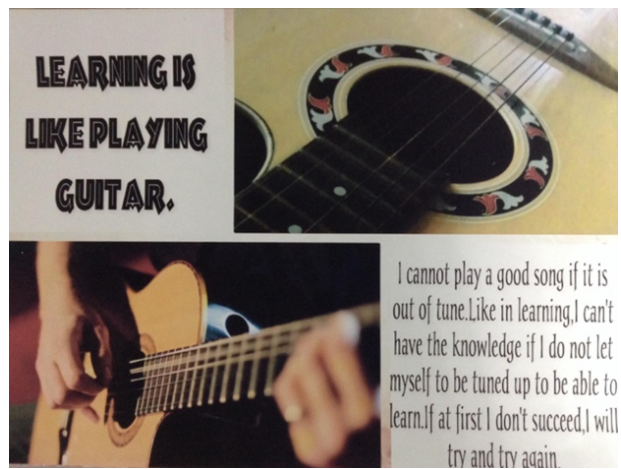


Photo 8. "Learning is like reading a book. It allows me to dream with open eyes and learn from experiences."

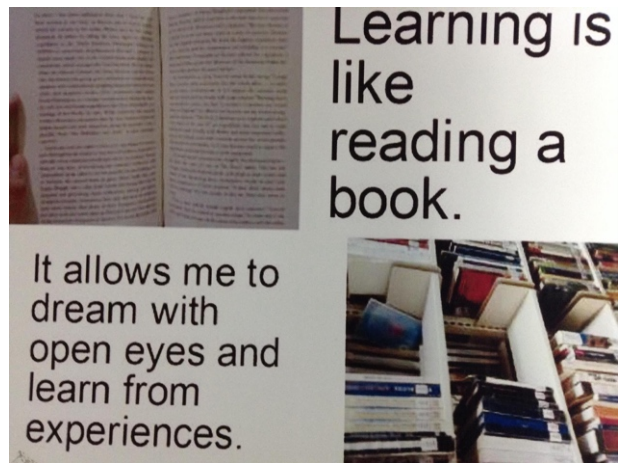


Photo 9. "Learning is like riding a car. It starts on a simple ride but ends up on a great journey."

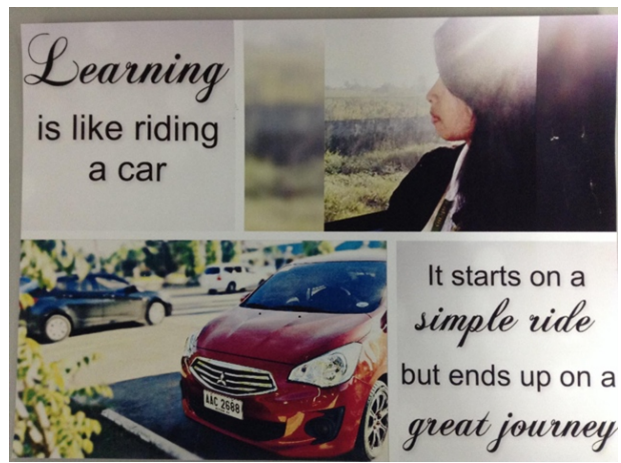


Photo 10. "Learning is like a food. It satisfies and fills my hunger for new knowledge and information."



Photo 11. "Learning is like an art. It pushes me to the limitless of life."



Photo 12. "Learning is like climbing a tree. It helps me to exercise patience while I strive to achieve my goal of reaching the top."



thoughts and feelings. It helps me understand better.”

On the same note, another participant directly compared learning to a process as seen in Photo 3. It will eventually lead to somewhere good so long as “you’re determined to do so,” she said. “Learning is a part of my everyday life, by knowing that everything has a process, I feel very secured and delighted to learn everything that I needed and wanted to learn,” she added.

Participant 4 had the same line of thoughts but added “growth” and “experience” in her narrative. She stated that “learning helps me to learn from my experiences. It does not only require me to think about what I have done, what I have read, or what I have experienced but it becomes a part of my growth—knowing how to use the new knowledge. It is always linked to action and theory practice.”

Adom, Yeboah, and Ankrah (2016) found similar points in the process of construction of knowledge from a constructivist perspective. Honebein (1996, as cited in Adom et al., 2016) stated the same as the narrative in Photos 3 and 4, that “people construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences.” Adom et al. (2016) cite Cashman et al. (2008) and Hein (1991) when they say that constructivism “is based on the analogy or basis that people form or construct much of what they learn through experience.” Hence, the key to learning in the constructivist classroom is viewing it as an experience and a process.

Another participant used farming as a simile for learning in Photo 5 as both require “dedication, understanding, and application of the new ideas,” she said. “Above all, constant reflection requires the desire to win over the struggles no matter how hard it may seem to attain. I am like a grain that through farming and step-by-step process, my goals will be attained through hard work—studying hard. Learning is a never-ending process, and the best teacher is our experiences.”

Another interesting comparison can be seen in Photo 6 as learning was compared to climbing a staircase, a step-by-step process. Participant 6 further elaborated that “learning is acquired through experience, study, and what is being taught, then progress could take place and finally reach the top called knowledge. Learning takes time and space. Self-directed learning process is most powerful in facilitating inspiring individual development. It empowers personal learning and development.”

In Photos 3, 5, and 6, however, the participants imposed that learning requires more than a good environment or a good facilitator. It is a process within the learner that requires determination and engagement as participants see learning as a goal, hence “engaging the student in the teaching and learning processes so that his engagement would enable him personally [to] discover the knowledge or ‘truth’ ” (Adom et al., 2016, p. 2).

Motivation should be then further taken into consideration for students who view learning this way. Teachers must then have to explain why students need to learn the content and what benefits they will achieve by doing so. Kim (2005, as cited in Adom et al., 2016) supported this in his claim that “unless learners ‘know the reasons why,’ they may not be very involved in the content taught even by the most severe and direct teaching method.”

Participant 7 elaborated on learning as an event that is not bounded by the four corners of a classroom. Her photo implies that learning is everywhere. She said it is like playing guitar. She stated, “I can acquire knowledge through simple things in my everyday life. Experiences help me to have an insight and clear vision of how important learning is. I believe that learning is a continuous process. I have to develop and enhance myself. If I have [a] goal in mind, it could lead me to a better future.” Hogan and Howlett (2015) noted this phenomenon of being “more open” as scholars put it, as we see learners abandoning old ways of learning and realizing varied ways to learn even outside the classroom.

Photo 8 is a participant’s reflection comparing learning to reading a book. Participant 8 stated that she intends to read more books in different genres so she can develop the holistic aspects of life. “It helps me grow more into [a] more mature individual,” she added. The behavior of the student fuels the learning process in this sense. She views learning as a process, a series of actions towards growth. In the same thought, Mezirow and Associates (2000) stated that learning is “planning a course of action,” “implementing one’s plans,” and “building competence” towards the goal: growth and maturity.

Like Participant 4, Participant 9 also touched on learning and experience. She uttered, “as I live my life, I continue to learn and experience a lot of different things which made my journey great.” She also mentioned learning as similar to riding a car. She stated, “at first, riding a car may seem to be simple and ordinary but when I started to have experiences, I consider my ride as meaningful, great, and essential. I should learn to improve my skills and nurture my abilities to be extraordinary. With this, I learn that life itself is a wonderful world of learning.”

Participant 10 shifted focus and expounded on comparing learning to food. She stated that in learning, “part and parcel of our growth and nourishment is the benefits that food provides us. Therefore, learning is more beneficial when we take in food boosters that will suffice our bodily needs.” She further elaborated on this when she added, “I seem to eat a lot of food; that is because I want to sustain the needs of my body to enable me to perform my tasks and duties. And also, food is not only for the mind, it is also for the soul. So, learning would basically be more fun when I take in healthy foods that will help my body to cope up with the everyday tasks.”

Participant 11 had a different perspective. She stated that learning is more like an art as it “requires uniqueness, creativity, willingness, and thinking out of the box.” She further explained this: “Just like in accumulating learning, an art requires willingness. Learning should be fun. It should not only be in the cognitive but in the affective domain as well. That is why learning is very important inside the classroom. It is like putting our heart to it.”

Participant 12 has the same line of thinking as that of Participant 6, that learning is more like climbing a tree. He added that “learning is not just present in books but in my experiences too. There is learning in everything I do, even just for fun.” He also narrated how learning is “pushing through what I think my limitations are—skills and capabilities—for my betterment. Though hard, as all things are, there is a feeling of satisfaction in the end.” Achieving things, growing and developing under circumstances may be challenging. It is not learning when one cannot apply what has been learned, he ended.

Photos 11 and 12 viewed learning as an activity that requires self-empowerment, dedication, and an application of knowledge. Similarly, Badie (2016) examined learning as an activity of construction, and posited that “knowledge acquisition (and learning) are transformative through self-involvement in some subject matter.” Watkins, Carnell, Lodge, Wagner, and Whalley (2002, as cited in Badie, 2016) were able to capture the participants’ views of learning when they stated that “knowledge acquisition is the reflective activity which enables the humans to draw upon their previous experiences [and background knowledge] to conceptualize [and, respectively, to realise and to understand in order to] evaluate the present, so as to build up and shape future actions and to construct [and, subsequently, to develop the construction of] new knowledge.”

Table 2 presents the significant themes and relevant themes extracted from the photo reflections which were used in the reflective analysis and interpretation to come up with the eidetic insights. Significant themes are the primary themes; these are direct descriptions of what learning is, based on the participants’ reflections on their photos. Relevant themes are the subthemes based on the participants’ explanations of the relationships of the photos to their descriptions, thus deepening their answers.

For instance, Participant 11 captioned her photo “Learning is like an art.” Her explanation of this is that learning is an event of creativity and a way of thinking outside the usual patterns. This was further deepened by the subtheme; to fuel the creativity, passion in doing things (learning) is then a necessity.

Eidetic insights from extracted themes

The phenomenographic part of the study is in the presentation of the verbatim sharing of reflections. Eidetic

reduction is the process of assessing the patterns of meaning in the narratives of the participants and getting the perceived nucleus of truth (Ramirez, 2006) or “eidōs.” To uncover the eidōs of the extracted themes, the researchers analyzed and grouped the significant descriptions of how the participants view learning. They then classified the eidetic insights (Figure 3).

Learning as an experience

“Learning is experience. Everything else is just information.”

—Albert Einstein

Participant 4 shared “Learning helps me to learn from my experiences. It does not only require me to think about what I have done, what I have read, or what I have experienced but it becomes a part of my growth—knowing how to use the new knowledge.” This meant that learning is thinking about the experience and applying the knowledge gained.

Participant 6 posted “Self-directed learning process empowers personal learning and development.” Similarly, Tarrant (2013) used the same word, empowerment, to define the experience. He said that the concept of reflection somehow empowers the person reflecting as they are considered as a part of the process, where they create a sense of identity as they see their variations of the interpretation of the occurrence.

Knowledge is constructed based on personal experience, meaning, it is self-constructed and is feasible through reflection. According to Participant 7, “I can acquire knowledge through simple things in my everyday life. Experiences help me to have an insight and clear vision of how important learning is.” For Participant 12, “Learning is not just present in books but in my experiences too. There is learning in everything I do, even just for fun. It is pushing through what I think my limitations are—skills and capabilities—for my betterment.” Experiences give important insights and give opportunities to discover limitations and skills.

In the same note as Participant 12, Gibbs (1988) concluded that experience alone is useless if the learner is not able to reflect on it. From the reflections of the experience, one extracts the feelings and thoughts that shall provide conclusions. Learners then either use these conclusions to get through the same situations or modify existing conclusions to deal with new situations effectively. Without reflection, these experiences, considered as learning potentials, will simply be forgotten.

Learning as a goal

“Education is our passport to the future, for tomorrow belongs to the people who prepare for it today.”

—Malcolm X

Participant 1 shared, “The photo depicts how I make each of my achievement as footsteps towards my dream.

Table 2. Thematic documentation from shared reflections

Photograph number	Significant themes	Relevant themes
1 <i>"Learning is like my feet."</i>	Aiming to reach goals/dreams	Making progress towards fulfillment of dreams
2 <i>"Learning is like using a pen."</i>	Having a purpose	Adaptation and expression
3 <i>"Learning is a growing plant."</i>	Determination; making a difference	No one should be forced to learn; learning is a process
4 <i>"Learning is like having a passport."</i>	Thinking about the experience; connecting knowledge with application	Learning is a process; desiring to engage oneself to learn; taking the process
5 <i>"Learning is like farming."</i>	Dedication; application of new ideas; desire to win over struggles	Effort; hard work; process; goals will be attained
6 <i>"Learning is like stairs."</i>	Knowledge is constructed based on personal experience; it is a step-by-step process; learning takes time and space; self-directed learning experience	When one experiences things, progress takes place; learning to adjust; empowering personal learning and development
7 <i>"Learning is like playing guitar."</i>	Having a goal and striving hard to reach it; experiences give important insights	Way of expressing thoughts and feelings; continuous process to enhance and develop oneself
8 <i>"Learning is like reading a book."</i>	Developing or improving oneself	Growing into a mature individual
9 <i>"Learning is like riding a car."</i>	Gaining learning through experience; reflecting on the positive side to reach the goal	Improving skills and nurturing abilities; learning is interesting and exciting
10 <i>"Learning is like a food."</i>	Growth	Sustaining to perform well
11 <i>"Learning is like an art."</i>	Dedication and proper attitude towards achieving one's goal; creativity, willingness and thinking out of the box; an expression of feelings and thoughts	Like art, we need passion in doing things; encouragement is important; learning is understanding and sharing
12 <i>"Learning is like climbing a tree."</i>	Discovering limitations and skills	Applying what has been learned

Reflecting on my learnings helped me make realizations towards fulfillment of my dreams." For her, aiming to reach goals, having a purpose, and making progress towards the attainment of goals made sense for learning reflectively. Participants 7, 8, and 9 shared that having a goal and trying to reach it, developing or improving oneself, and improving skills and nurturing abilities are significant in learning.

With the same point of view, Schön (1991, as cited in Pollard, 2002 and Tarrant, 2013) noted that learners distance themselves from the experience and try to see it using a different perspective, with the aim of refining how they will tackle the same situation in the future. Only through this, can one check and scrutinize the implied understanding that might have been developed from repetitive experiences. This is how they modify concepts

that have already been established, creating a new way to understand the experience.

Learning as a process

The capacity to reflect on action is to engage in the process of continuous learning. This is one of the defining characteristics of professional practice (Schön, 1991, as cited in Tarrant, 2013).

Participant 6 posted, "Self-directed learning process is most powerful in facilitating inspiring individual development." For them, learning is a step-by-step self-directed process that takes time and space.

According to Participant 3, "Learning is part of my everyday life, by knowing that everything has a process, I feel very secured and delighted to learn everything that I needed and wanted to learn." Learning is a process

where no one is forced to learn.

Participants 5 and 7 said that learning is a continuous process to enhance and develop oneself, and is an application of new ideas.

Reflection necessitates the activation of subjectivation, that is, the individual must become the object of their own reflection to be able to provide new meaning to themselves within a given situation, Freda and Esposito (2017) stated. This can be observed from the narratives of Participants 5 and 7, as well as Participants 6 and 3 who all recognized the value of learning as a gradual course done through reflection.

Sellars (2014), in the same note, agreed that reflective learning mirrors Kolb's cycle as it presents the clear process of reflection. Indeed, reflection is somehow an interaction for deeper understanding of a concept or a phenomenon that may occur in collaboration or even in self-reflection, Henderson, Napan, and Monteiro (2004) added.

Learning as an expression

Learning entails determination and effort. Participant 3 confirmed that dedication and determination make a difference. She said, "It helped me realiz[e] and reflec[t] that everything can be learned if you're determined to do so."

Learning is an expression. Participant 2 said, "By writing, I can easily adapt to the lesson. I chose writing for me to freely express my thoughts and feelings. It helps me understand better."

It entails effort. According to Participant 5, "I used the word farming because learning requires dedication, understanding, and application of the new ideas. Above all, constant reflection requires the desire to win over the struggles no matter how hard it may seem to attain."

Participant 6 declared that "it empowers personal learning and development." In addition, Participant 11 shared, "Reflective learning is like an art. It requires uniqueness, creativity, willingness, and thinking out of the box. Just like in accumulating learning, an art requires willingness." It is likewise "an expression of feelings and thoughts."

The wealth of knowledge and routines that they can employ, in fact, is so automatic that they often do not realize why they perform a certain plan or action over another. However, when questioned, they are able to reconstruct the reasons for their decisions and behavior (Berliner, 2001).

Figure 3 illustrates the phenomenon of learning using photovoice. In conclusion, learning using photovoice hones expression as it promotes empowerment and creativity. Learners are freely able to express their understanding of the topic pushing them to be more creative and dedicated to answer not just "what have I learned" but "how did I learn it." This leads them to exploration



Figure 3. Describing learning in a constructivist classroom using photovoice

and discovery, an experience of learning. The acquisition and application of knowledge which is the main goal of any teaching-learning process can also be gleaned from the learners resulting in growth and adaptation.

Conclusions and recommendations

The findings lead to various understandings of learning in a constructivist classroom. It is a room where learners can grow and adapt, experience learning on their own at their own pace, and acquire skills through application of concepts as they journey through the learning process. These findings then encourage educators to build an environment where learners can make mistakes without fear, explore notions, and create and experiment with new ideas without consequences on grades or failing.

To further promote learning, the researchers believe that in a constructivist classroom, after each learning instruction episode, an activity or practice of reflection may be provided. This further ensures deeper retention and appreciation of learning. Aside from a catalyst of the learner's learning process, the reflective practices and output can also be used further by the teacher as a guide in crafting and evaluating the teaching-learning process, learning objectives, and methodologies. Hence, this will ensure that the next learning instruction episode is centered not on the content but on the learner, which is the goal of every constructivist classroom.

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