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Scaffolding in PBL: A Case-study in Facilitated Soft Skill-set Learning amongst Adult Learners in Taiwan's Vocational Higher Education

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ABSTRACT

Taiwan's university-level vocational education is faced with a growing need to strengthen students' soft skills as a means to increase job market eligibility. Students in Taiwan are usually not equipped with group learning skills in junior and senior high school education. These learning skills, however, are an essential component of a successful PBL course, according to past research. This case study describes how a PBL course that adopted various scaffolding strategies helped vocational students improve soft skills associated with real-life issues in the workplace. The adult learners participating in the tailored PBL course were PBL novices, yet their feedback on PBL effectiveness was positive. The success of the PBL course was attributed to 1) the use of effective scaffolding strategies, and 2) learner readiness in the skills needed for group learning.

INTRODUCTION

Problem-based learning (PBL) has been increasingly adopted by Taiwan's Institutes of Technology (IOT)[1]. In response to job market requirements, from the late 2000s, the Ministry of Education (MOE) initiated a programme of project-based funding aimed at encouraging both public and private IOTs at the university level to adopt PBL for soft skills training. An issue encountered by many IOTs was the lack of faculty able to implement PBL. Moreover, Taiwan's junior and senior high school education, similar to many other Asian countries, focuses more on tests and professional training as opposed to equipping students with effective soft skills, such as team-work or interpersonal skills.

[1] In Taiwan, these IOTs include Colleges of Technology and Universities of Science and Technology.

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Therefore, in the mid-2010s, the MOE launched a project to fund IOTs to implement PBL in general education. General education refers here to a set of curricula in higher education that typically includes the competencies, skills, and qualities that students must know or acquire to meet the demands that the future will place on them. The MOE encouraged IOTs to recruit professional external PBL trainers outside the IOT system with the aim of achieving more properly implemented PBL courses. The case study highlighted here was funded by the MOE PBL-Project and implemented for a single academic term (from year 2017 to 2018) by trainers outside of the IOT system.

The PBL course took place in a private technological college of approximately 1,200 students. Class-time of 2 hours weekly for one academic term was required of students in order to pass the 2-credit course.

The class had funding for one main lecturer and one supporting lecturer, and both needed to assume the role of a facilitator on various occasions, particularly in the case of small group discussions. This course, 'Journey to the West[2]: Career development and problem solving', had the aim of helping to prepare students to solve complex managerial problems in the workplace. The objectives for the course were to (1) improve students' critical thinking skills, (2) improve students' problem-solving skills, and, (3) help students find better solutions for managerial problems in the workplace.

RESEARCH ON MEASURES TO ENHANCE PBL

Camp (1996) suggests that PBL is based on a foundation of collaboration and integration within a small group context. The effectiveness of PBL is impacted by how well students work together (Peterson, 1997). Past research has shown that the 'necessary' skills for PBL course participants include: consensual decision making skills, dialogue and discussion skills, team maintenance skills, conflict management skills and team leadership skills (Johnson & Johnson, 2014). As most of these are higher-order thinking skills, successful cases of PBL implementation most often occur in the context of advanced education, such as medical or legal education (Hmelo-Sliver, 2004; Polanco, Calderón & Dalgado, 2004). Yet recent research has revealed that low-achieving learners can also benefit from PBL through scaffolding or an integrated PBL approach (Hamidah & Yuriani, 2015; Haruehansawasin & Kiattikomol, 2018). Hamidah and Yuriani's integrated PBL approach provides a model for nurturing soft skills of higher-order thinking in vocational students (Hamidah & Yuriani, 2015). The research of Haruehansawasin and Kiattikomol also targeted learners in vocational schools,

[2]*Journey to the West* is a famous Chinese novel published in the 16th century. Nowadays, the book has gained renown for its ability to shed light on managerial problems in the work place.

concluding that using suitable scaffolding approaches for low achievers was critical in PBL.

IMPLEMENTATION: STUDENTS' BACKGROUND

The PBL class consisted of 35 freshmen and sophomore students from the same department. According to student feedback, they were all PBL novices, at least that is the college had yet to provide similar courses of instruction. Students in this class were all adults, whose working experiences ranged from 3 to 30 years. The lecturers also confirmed that many students had been salon managers or sole-proprietors. These past experiences had equipped them with mature interpersonal skills, which are the group learning foundation for a PBL course. Even though some younger learners had less working experience than the managers in class, those who had been managers could fill the role of a team leader and facilitate group discussions. In other words, the composition of such a learning group provided suitable grounds for fruitful small group discussions; and consensus could be built in problem solving simulations through discourse. Below is a brief description of the learning group:

- 35 students. (Male:8; Female:27)
- Work experience: ranging from 3-30 years, but most of the students had more than 10 years of experience working.
- Class make-up: students were all either freshmen or sophomores from the department of Fashionable Hair, Nail and Overall Image Design.
- Students were enrolled in the higher vocational education 2-year Diploma Programme.

Since the groups of adult learners were equipped with higher levels of interpersonal skills than those of most young vocational students, PBL was an appropriate approach to facilitate students' learning. In order to further scaffold students' learning, the course made use of a set of well-designed classroom activities, tasks and homework assignments, which required students' full participation.

THE DESIGN OF THE PBL COURSE

The aim of the course was to help students improve their soft skills and become more successful in their careers. The teaching strategy consisted of textbook readings which provided the basis of problem-solving resources for in-class discussions on career-oriented problems or issues. Furthermore, students were required to share their own working experiences with the class and brainstorm about commonly encountered

problems or issues in the workplace. The textbook selected for the course covered the following topics:

- How to be a good team player? How to lead a team?
- How to place the right person in the right position at the right time on a team?
- How to get trailblazers to play by the rules at work?
- How to keep pace with workplace ethics?
- How to overcome stress or dejection caused by work?
- How to deal with conflicts at work?
- How to build up good public relations?
- How to be successful in a career?

Students' own career issues/problems in their job field were also covered, such as:

- Issues of employees' tardiness at work.
- How to evaluate a hair designer's work performance and set equitable commission percentages on the basis of performance?
- How to set up and reinforce open communication platforms between the boss and the staff?
- How to boost employees' morale and get them more engaged in their work?

SCAFFOLDING STRATEGIES IN PBL

Schmidt, Rotgans and Yew (2011) provide an explanation of how soft scaffolds offer dynamic support, which includes conversations between lecturers and learners or among leaners themselves during the learning process. Soft scaffolds also involve learners collaborating at various performance levels and working in small groups to accomplish particular tasks throughout the learning process (Nussbaum et al., 2009). There are also hard scaffolds, which include the static supports or tools that are developed in advance to guide learners during the learning process. Due to limits on time and resources, the scaffolding strategies utilized in this case were all soft scaffolds. Furthermore, lectures made up part of each week's class to ensure that students were clear about weekly themes and learning targets. In the first few weeks of the class, the lecturers focused on students understanding of their responsibilities for learning in a PBL environment. These included formal talks in class or small talks with students during breaks.

A. Required textbook reading and worksheets writing

A textbook was selected as required reading for the course. Not only were learners required to read nearly every chapter of the book, they also had to answer open-ended questions from a worksheet that was provided to them each week (no more than two A4-

size pages in length). Worksheet questions reviewed the week's chapter and linked readings to the relevant learning topic, such as (to name only a few):

- The summary of the chapter.
- What are the key rules for career success from the author's point of view?
- How do you identify yourself with the character in the story of Journey to the West?
- How would you retell part of this story to link it to this week's theme?
- Do you think X (e.g. personality, public relations, teams, etc..) is important in career building? Why or why not?

B. Small group tasks

Small group tasks were another important scaffolding strategy in this course. Different members of small groups were formed into special task groups so that learners had the chance to work with other students with whom they had not been previously grouped. Some of the tasks were designed to break the ice; others to facilitate students' group learning. In the first 2-4 weeks of class, students were grouped with course mates with whom they were familiar. From week 5-8, students were grouped with course mates with whom they were not familiar. The strategy was to have students work with others in completing a given task. These group activities or in-class tasks were done for the purpose of building up consensus in problem-solving through shared experience and brainstorming. Here, the constructivist approach could be implemented owing to the focus on interactive discussion-based learning that used a set of topics highly relevant to learners' experiences in the workplace.

C. Facilitators' input in students' problem-solving processes

Even though these adult learners were mature group learners, it was still difficult for them to 'state the problems' clearly, as they were never trained to analyse an issue or a problem. Therefore, from week 10-12, the lecturers played a more active role as a facilitator by guiding each group in defining their problem and giving a clear statement on the problem they wished to solve. Lectures provided examples of problem-solving models as well as instruction in a 9-step problem-solving method (also some concrete examples) to guide each group in step-by-step analysis and brainstorming. From week 13-15, each group started to work on their own problem solutions based on shared experiences, or group discussions and consensus. Students were also encouraged to use 'figures, charts or tables' as persuasive aids in the completion of a problem-solving handbook. In the final stage of the class, each group presented their selected problem or issue and then simulated the problem-solving process as a demonstration of PBL learning outcomes.

In correspondence with the above overview of a weekly class, the following table shows the scaffolding strategies employed at different stages of this course.

Week	Strategy	No. of students in Groups/individual assignment	Note
Weekly	Chapter reading and worksheet writing (including summary writing, and open-ended question answers)	Individual assignment	
Week 2-4	Lecturing, task completion	4-5 persons/group & Individual assignment	Group composed of course mates with whom they are more familiar
Week 5-8	Lecturing, task completion Workplace problems discussion (Experience sharing)	2-3 persons/group 4-5 persons/group	Group composed of course mates with whom they are not familiar
Week 9	Focus group discussion (sharing the most updated ideas/issues in the workplace)	10-12 persons/group	Group composed of those with similar backgrounds/working experiences
Week 10-12	Lecturing (on how to do problem solving reports) Group discussion on the problems to be presented in their final reports	4-5 persons/group	Group membership fixed for remainder of course. Lecturers help nail down the problem by asking students to give clear 'problem statements'.
Week 13-15	In class discussion on step-by-step problem solving solutions Group final report presentation preparation	4-5 persons/group	Group membership fixed. Lecturers help pin down possible solutions for each group's problem.
Week 16-18	Final report presentation Problem-solutions for the workplace handbook completion	4-5 persons/group	Group membership fixed. Students built individual portfolio derived from the learning outcomes of the course.

Table 1. Scaffolding strategies in the different stages of the course

REFLECTION: LEARNING EFFECTIVENESS OF PBL

Past research has shown the effectiveness of PBL, though much of this body of research has been restricted to advanced or relatively mature learners (Pederson & Liu, 2002). The research of Haruehansawasin and Kiattikomol, however, indicates that 'low-achieving learners in a PBL environment may benefit from more explicit guidance and encouragement to take a more participatory role in learning' (Haruehansawasin& Kiattikomol, 2018, p.369). This case study provides similar results and points out a key role played by scaffolding strategies in PBL learning, especially for low achievers or PBL novices.

Throughout the duration of the 4.5 months of learning, students were taught by means of well-designed learning activities and tasks that required the utilisation of dialogue, discussion and team leading skills by individual students, most of whom came with basic know-how in these processes. These in-class activities and tasks were an apparent factor affecting PBL novices' learning and their understanding of their roles in learning. Also,

textbook reading and weekly assignments were the foundation of problem-solving simulations. With a combination of lectures and facilitated in-class discussions, students did not get 'lost' or find it 'too difficult' during the process of learning and problem solving. Note that problem selection for each group's final presentation was based on students' own working experiences but specifically targeted at helping students solve a current job-related issue, which motivated students to seek out (better) solutions.

Learners' reflections on the course

As they were all novices to PBL, students found their first few weeks of learning 'puzzling'. Nevertheless, with the gradual adoption of soft scaffolding strategies in class, students got better acquainted with course mates and acquired increasing understanding of course learning goals. They also had to construct their own learning as learners placed in a 'student-centred' learning environment. Below is an excerpt from student comments during an in-class discussion on week 14:

> *'I now totally understand why the teacher had asked us to do the weekly assignment. I must be honest, I did not really like this weekly assignment in the beginning of the term. Now I must say this assignment is necessary! The weekly reading and writing tasks are to assist our understanding of the course theme and help us find better solutions to solve problems which we have encountered at work or in life.'*

The comment reveals how she came to link herself with the course's tasks and assignments, which were part of the scaffolding strategies used in class. She also understood (at last) that PBL was to help improve her soft skills in career development.

Facilitator's reflections on the course

Since past research has focused more on PBL being adopted for advanced learners, it might be a challenge for lecturers to adopt PBL for use with vocational students who usually do not perform so well in academic environments. In this case study, the successful PBL implementation, according to the facilitator's feedback, was attributed not only to the adoption of scaffolding strategies but also to the fact that these vocational students were all adult learners who came better equipped with group learning skills, especially those of dialogue and discussion based on their years of accumulated working experiences. This indicates that student-centred learning approaches, e.g. PBL, are less of a challenge for teachers to implement in such learning groups.

CONCLUSION

If one of the teaching goals in the 21st century is to teach students 'how to learn, un-learn and re-learn', PBL is one of the approaches to facilitate student acquisition of skills that will help them meet the challenges of rapidly changing needs in job markets (Tik, 2014).

The case presented herewith showcases how PBL can be implemented with scaffolding strategies for a group of vocational adult PBL-novice learners.

This PBL course was a one-off case. Surely, larger scale studies under a variety of settings and circumstances should be carried out in Taiwan if more funding can be located. Also, levels of soft skills acquisition in a PBL course can be further addressed through qualitative or quantitative analysis to verify the findings of this case study.

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