

## ORIGINAL ARTICLE

# The Applicability of Experiential Learning Theory to Complex Work-based Learning Situations

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## ABSTRACT

**Introduction:** The objective of the study was to explore the aspects of work-based learning environments and to identify the factors that stimulate or inhibit learning based on the theoretical framework of experiential learning. Utilizing Kolb's learning cycle, the authors aimed to describe, compare and analyze two learning situations in undergraduate medical education, and to consolidate recommendations based on the theoretical principles. **Methods:** Data collection was done through a qualitative approach by interviews and observations at two institutes for 4th year undergraduate medical students in a tertiary hospital in Malaysia and in Singapore. **Results:** Kolb's learning cycle stages can be linked to the learning situations. Both institutions had the problem of high student to educator ratios. There was limited opportunity for the students to examine and present patients. Time limitation was another constraint as not all students could perform physical examinations. These inadequate opportunities to apply knowledge and active participation limited the "concrete experience". As discussion and feedback sessions were insufficient, the "reflective observation" and "conceptualization" stages were also compromised. Educators had difficulty determining if students made sense of the cases and if their learning was adequate. "Active experimentation" was also limited to end-of-posting examination only. **Conclusion:** Kolb's learning cycle from the experiential learning theory can be used in these learning contexts to identify methods to improve students' knowledge and skills acquisition, as well as to encourage reflection and applied learning.

**Keywords:** Experiential learning, Clinical learning, Learning theories, Undergraduate medical education, Work-based learning

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## INTRODUCTION

Experiential learning is mainly defined as how individuals learn individual things in their own ways as they react to individual perceptions of experiences (1). Work-based learning may be defined as a learning experience that allows students to learn in real workplace settings, also known as 'situational learning' under the supervision of the professionals and seniors. In undergraduate medical education, this is where the trainee students attend the clinics and wards during their clinical training and observe, perform or take part in the medical practice of the clinical trainers or physicians.

Clinical learning thus, is a vital component of work-based learning in medical education. The clinical attachments are essential in undergraduate medical education to provide a realistic, practical and a "situational learning" environment for them to apply

their knowledge in clinical situations. Although there are many benefits of these work-based learning in medical education, and even though, the learning potential of these work-based learning environments is generally regarded as high, numerous researchers have reported that learning in these contexts is often met with challenges and continuous difficulties (2-4). Furthermore, there are data to suggest that there have been deficiencies in the teaching of clinical skills for undergraduate medical students. In addition to this some evidences also suggests that teaching & learning that occurs in the clinical setting is inadequate in terms of consistency of skills and competencies achieved (2,5,6).

Many researchers have been addressing these issues of workplace learning, clinical teaching and learning methods in undergraduate medical education. However, there isn't much systematic examination of the content of these learning situations and few have reported on the detailed structure of these clinical teaching and learning experiences (5,7).

Kolb's learning cycle, which is very strongly associated with experiential learning is a constructivist theory

concerning how learners take experiences from the external world and how they interpret experiences, give them personal meaning, and plan new actions in response to their interpretations (8). Kolb's four-stage cyclical model consists of four modes of adaptive learning (Figure 1) that includes: 'concrete experience, reflective observation, abstract conceptualisation and active experimentation'. Kolb's experiential learning theory can explain several phenomena related to learning clinical skills and clinical competencies in the medical workplaces (9,10). It has been found that, Kolb's experiential learning theory, with its guiding principles, is applicable and relevant to learning in clinical workplaces (1,11).

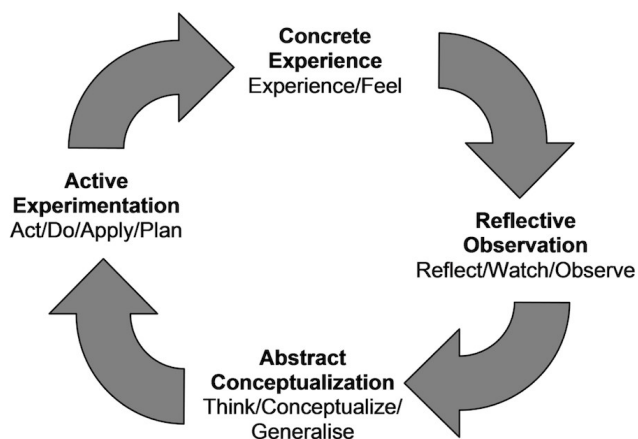


Figure 1: Model of Kolb's (1984) Experiential learning (13)

The objective of this study was thus to explore the important principles underpinning effective clinical learning based on the Kolb's experiential learning cycle. Since there is a need to re-evaluate and improve on teaching clinical skills effectively, this study aimed to explore the aspects of work-based learning environments and identify the factors that stimulate or inhibit learning in these environments based on the theoretical framework of experiential learning. Utilizing the cognitive perspective of experiential learning theory and Kolb's learning cycle (1,12,13), the authors aimed to describe, compare and analyze two learning situations in undergraduate medical education, where teaching and learning occur in a clinical work-based context. Subsequently it was also our aim to develop a structured teaching and learning requirement based on the theoretical principles of a well accepted experiential learning theory.

## MATERIALS AND METHODS

### Setting

#### Context – Institution A

The learning context A was in an Otorhinolaryngology (ORL) outpatient clinic in a tertiary hospital in Kuala Lumpur, Malaysia. The students were in their fourth

year of their bachelor of medicine and surgery course, where they undergo training in subspecialties such as ORL, Ophthalmology, Anesthesia etc. Their training in the ORL posting was for 2 weeks.

#### Context – Institution B

The learning context B was in an outpatient paediatric neurology clinic in a tertiary hospital in Singapore. Students in this context were also in their fourth year of MBBS, undergoing an 8-week rotation in paediatrics. Within the Pediatric posting, the pediatric neurology rotation was completed in 2 weeks.

### Ethical clearance

Research and ethical approval were obtained from the Research committee of the (MSU) Management and Science University prior to data collection and interviews. (2017)

### Design

We decided to do a qualitative analysis for this study as a qualitative research is best suited to interpret and develop a detailed understanding of a central phenomenon of a study that is difficult to be translated into variables (14). Therefore, we believed that a qualitative approach could more vividly clarify the students' and teachers' perceptions on their experiences of experiential learning and by observing these contexts and experiences we can interpret the active and passive processes of all the stages of the learning cycle without affecting the influential factors and variables.

### Data collection

Data collection was done through a qualitative method by interviews and observations at two institutes for 4th year MBBS students. The authors chose a process of observation where data was collected at both sites. Information regarding both work situations in each setting was collected through field notes and unstructured text data collected during observations by the researchers. The interviews were conducted as unstructured, open-ended interviews from randomly selected students and teachers from different sessions. This allowed to trigger and elicit unstructured information from the students and teachers to correlate with the theories behind the study (14). The open-ended questions encouraged the students and teachers to share their perceptions and experiences of the sessions allowing to obtain detailed information from the participants. Each interview lasted for about 10 - 20 minutes.

### Analysis

The collection of data and analysis was carried out concurrently as an iterative process. We employed constructivist thematic analysis, which examined their learning experiences in detail. The thematic analysis was based on the four steps as identified by Green and colleagues (15), immersion in the data; coding; creating categories; and identification of themes. During

the analysis, the findings were applied and correlated to the steps of the Kolb's learning cycle. Analytic findings from both contexts were compared and represented accordingly.

## RESULTS

### Learning situation – Institution A

The ORL posting aimed to acquire basic knowledge and understanding of common diseases involving the ear, nose and throat. Students were expected to approach, examine and interpret findings of an ORL patient to achieve a differential diagnosis and discuss investigations and basic management.

The goal of this learning situation was to achieve the knowledge and skills of taking a history and performing a physical examination relevant to the presenting ORL symptoms. This skill is formally tested at the end-of-posting examination and as a "short case" in the final MBBS clinical examination.

This learning situation occurs in the ORL outpatient clinic, during scheduled consultations with "walk-in" new patients and "follow-up" review patients. For each two-week rotation, fourteen to fifteen students were attached to three teaching consultants, with four to five students per consultation room.

Usually, students examine patients chosen by the specialist and present their findings. The specialist observes the examination steps, provides immediate feedback and leads a discussion regarding possible differential diagnoses. They may then demonstrate correct examination methods and abnormal physical signs. Time permitting, some student observers would be allowed to repeat the relevant examination steps to appreciate significant findings or pathology. As expected, patient numbers, diagnoses and cooperation limit students' experiences.

In some instances, students took clinical history from patients in the waiting area. The history was then presented to the specialist and the group in the patient's presence. During complicated procedures such as endoscopy, students were mainly observers. While procedural skills are not expected at undergraduate level, anatomical and pathological findings are beneficial for students' learning. After the clinic, students' queries were briefly addressed, and in some instances the specialist gave a small assignment regarding the case being discussed and managed.

From the tutor's perspective, the main problems included regarding the large student numbers which resulted in limited learning experience and teaching time. With four to five students to a session, there was limited opportunity for students to examine patients through "hands-on experience". The students were unable to

visualize all the clinical findings, as they had to take turns. Additionally, clinicians were under time pressure as they were expected to also provide clinical service during the session. Hence there was a conflict of the needs of the patients and students. This resulted in the clinician limiting discussion time or examination and presentation opportunities. Also providing constructive feedback to individual students was found often difficult as it was challenging for tutors to determine the student's level of learning and their shortcomings.

### Learning situation – Institution B

The purpose of the learning situation is for students to learn about conducting a physical examination, which is tested in the form of a "short case" in the final examination. They are expected to improve their physical examination skills to be able to identify normal and abnormal signs to synthesize their findings into relevant differential diagnoses. They are also expected to acquire skills in professionalism and communication in the paediatric context.

In this learning situation, three to four students were attached to an outpatient clinic, which is a three-hour session. The tutor introduces the caregiver and patient to the team present, and provide a summary of the patient's condition, such as his/her age and acute or chronic problems without revealing the diagnosis. Students perform a relevant and a focused physical examination. These are skills, which have been taught to them in prior lectures, but without actual patient contact. After the examination was completed the findings were presented to the group. The tutor provided feedback on the student's examination method, the accuracy of the findings reported and in overall how students synthesized and presented the case. Abnormal physical signs were demonstrated to the rest of the students and other students were allowed to perform physical examinations to eliciting the important findings. However, depending on the cooperation and suitability of the patient, some patients may not be examined by all the students in which case, they took turns in observing the consultation process. At the end of the entire session, the a summary of the learning points from the session were provided.

Problems from the tutor's perspective include a large number of students participating in the session, and hence only a limited number of students may get to examine patients and synthesize their findings. It was often difficult for the tutor to diagnose the learner's level of learning and assess what the students were learning. This was particularly challenging for students who were observers during the session, as they only have minimal practical experience with the patient. Due to the need for clinical service during the learning session, time was also an important limiting factor. There may not be sufficient time for students to perform and to repeat the physical examination, or for the tutor to provide

constructive feedback. This also limits their performance opportunities in communication techniques and professionalism.

## DISCUSSION

### Learning Theory

The theory chosen is the cognitive perspective of experiential learning theory, which states that learning is often most effective when related to experience (1,16). This theory is based on three key assumptions: learning is context-associated, interactions are vital for learning, and students learn to practice from experience (1).

Kolb proposed a four-stage cyclical model of knowledge development, which combined an individual's conscious recognition, and transformation of experience (13). (Fig.1)

### Relationship between Learning Theory and Problems in Learning Situations

Kolb's learning cycle stages can be linked to the learning situations. Both institutions have the problem of the high student to educator ratios. A maximum of 3 students per consultant is ideal

(17) but with about five students in each room, there is limited opportunity for them to examine and perform a complete clinical examination and present the cases. Time limitation is another constraint as the clinicians conduct their teaching during their consultation and clinical service. It would therefore be challenging for students to achieve an individualised experience. These inadequate opportunities to apply knowledge and participate actively will limit the "concrete experience".

In addition, since discussion and feedback sessions were also inadequate, the "reflective observation" and "conceptualization" stages were also compromised. Educators will also have difficulty determining if students were able to make sense of the cases and if their learning is adequate.

"Active experimentation" is limited to end-of-posting examination due to similar factors. This is not the ideal situation to "actively experiment" as they will be graded and would not be provided feedback, in contrast to day-to-day learning situations. We feel that this could be one of the Kolb's main component that is compromised most, in the context of clinical learning based on the above learning situations.

### Comparison between Learning Situations in Both Institutes

The learning contexts described in both institutes were very similar in terms of programme, clinical components, course structure and teaching methods.

The following similarities are highlighted in detail:

1. Learning tasks were similar in both situations – Students

were expected to complete few weeks of attachment in the clinical setting supervised by consultants of the hospital with patient interactions.

2. The sessions' priority is clinical service and is not designed for teaching. In both institutes the clinical teaching sessions were allocated during regular consultation hours, therefore the availability of time for discussions, feedback and guided teaching depend on how busy the clinic is.

3. Students' learning and experience depend on the tutors' organizational skills and interests. The specialists in both the settings were hospital staff and not full time educators; hence their preparation level and demonstration strategies were different.

Some of the differences include:

1. In Institution A there was a case analysis, which is a graded individual assignment, and was not required by Institution B. This method of assessment is useful for reflection and conceptualisation where students relate to a new case and apply their knowledge.

2. In Institution B there was an organized time set for the entire session. Examination, presentation and discussion of a case have allocated time during the session and hence the teaching time was more organized. In Institution A, the time and method was variable as there were no set-time allocated during the session resulting it to be haphazard and poorly organized.

3. The patients were also not briefed prior the session in Institution A. There was also no prior introduction of the case to the students before proceeding into examination and discussion.

4. Also in Institution A, patients were not selected for the teaching, student experiences and learning depend on the random cases that present on that day.

Recommendations based on Learning Theory:

a) Concrete Experience –

1. Reduce the number of students per posting: This ensures equal opportunity for "hands-on" experience, discussion and feedback.

2. Quality vs. quantity: A dedicated teaching clinic with pre-selected patients is ideal, but will require staffing and other patients to be shunted to other clinics, hence increasing their service load.

3. Structure the session to improve the students' experience: Brief the patients before the session, to layout patient expectations to allow the patient to contribute to learning.

b) Reflection & Abstract Conceptualisation –

1. Have an individual case write-up as a summative assessment and obtain tutor feedback on their reflective exercise.

2. Peer feedback on each other's examination technique or presentation.

3. Have a dedicated feedback session at the end of the teaching to reinforce learning points and to encourage students to “reflect out loud”.

#### c) Active Experimentation –

1. Tutors to facilitate the “active experimentation” phase instead of just waiting for “active experimentation” only during the end of posting tests or summative exams. This could be done by providing similar cases as a formative assessment session for them to act and apply their knowledge in similar scenarios or cases.

2. During feedback sessions, students could be given “mock cases” or “paper cases” for tutors to assess repeated performances in similar situations.

3. At the summative assessment and end-of-posting tests, cases with similar conditions can be provided to allow students to apply their newly learned knowledge to reinforce previous learning.

### CONCLUSION

Thus, our study shows that Kolb’s learning cycle can be used to structure the stages of clinical learning to identify the strengths and weaknesses of the teaching and learning methods of the clinical phase. However, to ensure the transferring of the knowledge and experience of the practical medicine to the students, we believe that additional steps of teaching and learning methods need to be arranged to enhance and strengthen this transfer. These include additional training of the students on how to learn practical skills prior to the clinical sessions at home or in campus. These can be using videos, demonstrations, role-play etc. Clinicians and lecturers can contribute immensely in these aspects by methods like virtually demonstrating to students online or using pre-recorded videos etc emphasizing on the correct techniques and the “must-know” learning points. We also strongly believe that assessment methods also can be improved and enhanced to ensure the students achieve their essential learning points with regards to all the stages of Kolb’s learning cycle.

In conclusion, Kolb’s learning cycle from the experiential learning theory is a reliable theoretical reference that can be utilized in the clinical learning contexts to improve undergraduate medical students’ clinical knowledge and skills acquisition, as well as to encourage reflection and applied learning particularly in the early clinical phase.

### ACKNOWLEDGEMENTS

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### REFERENCES

1. Yardley S, Teunissen PW, Dornan T. Experiential learning: AMEE Guide No. 63. *Med Teach*.

- 2012;34(2).
2. Sajjad M, Mahboob U. Improving workplace-based learning for undergraduate medical students. *Pakistan J Med Sci*. 2015;31(5):1272–4.
  3. Egan T, Jaye C. Communities of clinical practice: The social organization of clinical learning. *Health (Irvine Calif)*. 2009;13(1):107–25.
  4. Williams C. Understanding the essential elements of work-based learning and its relevance to everyday clinical practice. *J Nurs Manag*. 2010;18(6):624–32.
  5. Walton JM, Steinert Y. Patterns of interaction during rounds: Implications for work-based learning. *Med Educ*. 2010;44(6):550–8.
  6. Chowdhury RR, Kalu G. Learning to give feedback in medical education. *Obstet Gynaecol*. 2004;6(4):243–7.
  7. Matsuyama Y, Nakaya M, Okazaki H, Lebowitz AJ, Leppink J, Van Der Vleuten C. Does changing from a teacher-centered to a learner-centered context promote self-regulated learning: A qualitative study in a Japanese undergraduate setting. *BMC Med Educ*. 2019;19(1):1–12.
  8. Yardley S, Teunissen PW, Dornan T. Experiential learning: AMEE Guide No. 63. *Med Teach*. 2012;34(2).
  9. Chung PJ, Chung J, Shah MN, Meltzer DO. How do residents learn? The development of practice styles in a residency program. *Ambul Pediatr*. 2003;3(4):166–72.
  10. White JA, Anderson P. Learning by internal medicine residents. *J Gen Intern Med*. 1995;10(3):126–32.
  11. Eraut M. How Professionals Learn through Work. *Director*. 2007;16(1):1–29.
  12. Dolmans DHJM, Wolfhagen IHAP, Heineman E, Scherpbier AJJA. Factors adversely affecting student learning in the clinical learning environment: A student perspective. *Educ Heal Chang Learn Pract*. 2008;21(3):1–10.
  13. Kolb DA. *Experiential Learning: Experience as The Source of Learning and Development*. Prentice Hall, Inc. 1984;
  14. Creswell JW. *Educational Research: Planning, Conducting and Evaluating Quantitative and Qualitative Research*. Fourth. Paul A. Smith CR, editor. Pearson; 2012.
  15. Green J, Willis K, Hughes E, Small R, Welch N, Gibbs L, et al. Generating best evidence from qualitative research: the role of data analysis. *Aust N Z J Public Health*. 2007 Dec 1;31(6):545–50.
  16. Secomb J. A systematic review of peer teaching and learning in clinical education. *J Clin Nurs*. 2008;17(6):703–16.
  17. Ramanayake RPJC, Perera D, Sumanasekera RDN, Fernando KAT, De Silva AHW, Athukorala LACL. Training medical students in general practice: A qualitative study among general practitioner trainers in Sri Lanka. *J Fam Med Prim Care*. 2015;4(2):168.