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An Application of 'LOVE' Model for Assessing Research Experience

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Abstract. 'LOVE' model has been recently developed with an aim to assist educators in designing and developing memorable learning programs so that students have an intensive understanding of a particular subject. The model states that the richest learning experience can be stimulated by providing four types of the crucial learning experience (LOVE experience): L-learning, O-observing, V-visiting, and E-experimenting. The model has a potential to contribute in developing student research experience. Therefore, presented in this paper is an attempt to apply the 'LOVE' model for assessing student research experience. An online survey on Master's graduate research experiences was conducted. The survey got 33 respondents who are graduates of our department from 2006 to 2015. Their opinions were used in the 'LOVE' model for assessment. The results show that there were gaps between expected and gained research experiences that need to be improved. The practical value of this approach is that advisors may be better able to predict and improve for providing the valuable research experiences according to their supervisory styles.

Keywords. Research experience, assessment, experience model, LOVE

Introduction

Enhancing customer experience concept has been spreading in various fields from service industry [1] to even education system [2], [3] where students are viewed as customers. This concept has been gaining enormous interests and driving researchers to develop various tools and applications to facilitate service designers and educators. One example can be seen in the bus service context where designing superior customer traveling experience provides better competitive advantages [4]. Another example is designing the greater wine tourist experience. It is found that customer satisfaction will be raised if the vineyard can offer activities that stimulate entertainment, educational, esthetics, and escapist experience [1]. These four types of experience were named as the 4Es model and proved from some researchers that they have a positive effect on customer satisfaction [5], memory and customer loyalty [6]. In the education system, it is reported that the 4Es model was incorporated into the e-LXD model for designing effective online learning experience which is functional, purposeful, engaging, memorable, and enjoyable [3]. Recently, the 4Es model has been further developed to be 'LOVE' model for accessing student learning experience, whether they gain the richest experience from a course/program [7]. The results suggest types of experience which should be fulfilled in order to strengthen the students' skills and competencies.

Therefore, it is seen that in today's modern competitive market, the experience is in a popularity for companies to stand out of the rivals, as well as for students, to strengthen their competencies and to be more marketable. This trend remarks crucial questions for graduates: do they have the high competency and are they ready to work in the real world. They do need proper and effective training during their academic life, especially during their research undertakings. This point motivates the authors to develop an application of the 'LOVE' model for assessing research experience. The proposed application is exemplified in the next section, followed by the illustration through master's research experience in a school of engineering. The last section of the paper points out the advantages of the proposed application and future works.

1. 'LOVE' model and its application

1.1. What is the 'LOVE' model?

The 'LOVE' model has been developed based on a well-known customer experience model (4Es model) which was invented by Pine and Gilmore in 1998 [8]. The 4Es model states that the richest customer experience is stimulated once educational, entertainment, esthetic, and escapist experience are given to customers at certain times. Viewing these four types of experience in education system give unclear understanding in practice. For example, what does the esthetic experience mean in an education context? Regarding this issue, the 'LOVE' model (Figure 1) has been developed to redefine those experiences for educators. They are learning, observing, visiting, and experimenting, respectively. If students can gain all the four experiences or LOVE experience in a particular subject, it increases their capability to be a good researcher of that subject.

Figure 1. 'LOVE' model [7].

In the 'LOVE' model, the learning experience is stimulated by two dimensions: student involvement (passive/active involvement), and nature of learning (absorption/immersion). In a course/program, students gain experience from being involved in class activities. A class lecture and discussion session are learning a particular subject from a distance where students can only absorb the delivered knowledge. If students fully give their collaboration in the activities, they will gain observing and learning experience, respectively. Students can immerse themselves in the subject by learning from real situations like a field trip and a group project. If they fully collaborate in these learning activities, they then gain visiting and experimenting experience, respectively.

1.2. The use of 'LOVE' model for assessing student learning experience

'LOVE' model was illustrated in the higher education context to assess students' learning experience in four graduate courses offered in the School of Engineering at Asian Institute of Technology, Thailand [7]. The courses were Statistic Model and Design of Experiment (DOE), Rapid Prototyping and Manufacturing (RP), Product Design and Development (PDD), and Industrial Packaging Design and Technology (PK). The work investigated whether each course provides LOVE experience to students. The results show that, typically, all the courses offer a class lecture so that students normally gain observing experience as a norm. However, among these four courses, only PK provides a LOVE experience to students by also offering other kinds of learning activities aside from class lecture such as class discussion, field trip, and a group project.

2. Assessment of research experience with 'LOVE'

Doing a research is a learning process that transform one who used to consume knowledge to be the one who is able to produce knowledge [9], [10]. To do so, this process should be effective to ensure that those students who are in the process will be successfully transformed. They must gain a variety of experiences which are transformative, influential, practical, effective and memorable to shape their research capability.

'LOVE' model stipulates that to be a good researcher, students have to gain LOVE experience. In other words, they have to play the roles of observer, learner, visitor, and experimenter at different and appropriate times to strengthen their research skills. Therefore, the 'LOVE' model is introduced in this study for assessing research experience, whether students gain various and proper experiences through their one-year thesis work in a Master's degree program. In this scenario, students have already passed their first year taking courseworks and attending seminars which is a typical format in the field of science technology engineering and math (STEM). The procedure for applying the 'LOVE' model for assessing research experience is exemplified in the following sections through the proposed table, assessing research experience table (Figure 2).

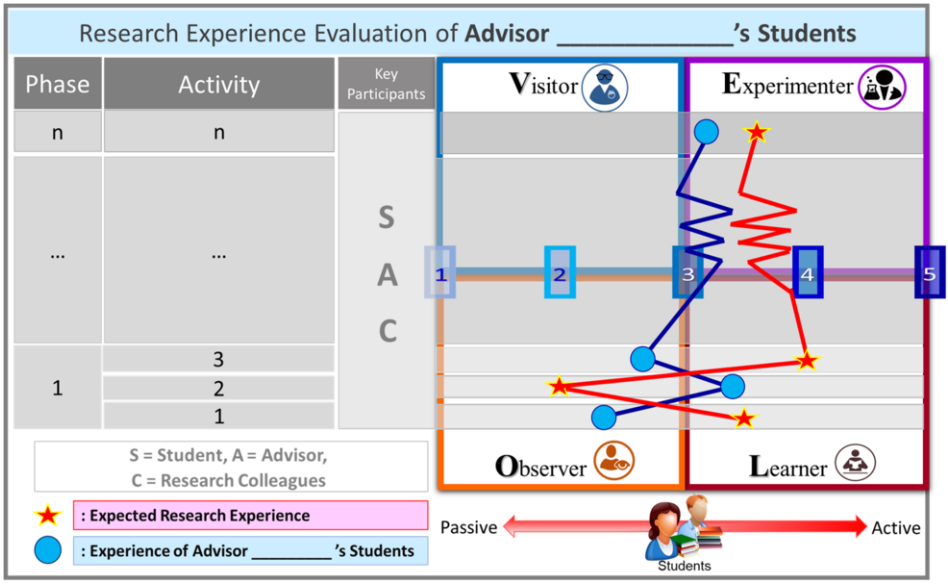

Figure 2. Assessing research experience table.

2.1. Identify research activities

Firstly, a set of research activities that students have to accomplish is listed and they are grouped into three phases: proposal, research, and publication. The components of each phase are displayed in the left part of Figure 3.

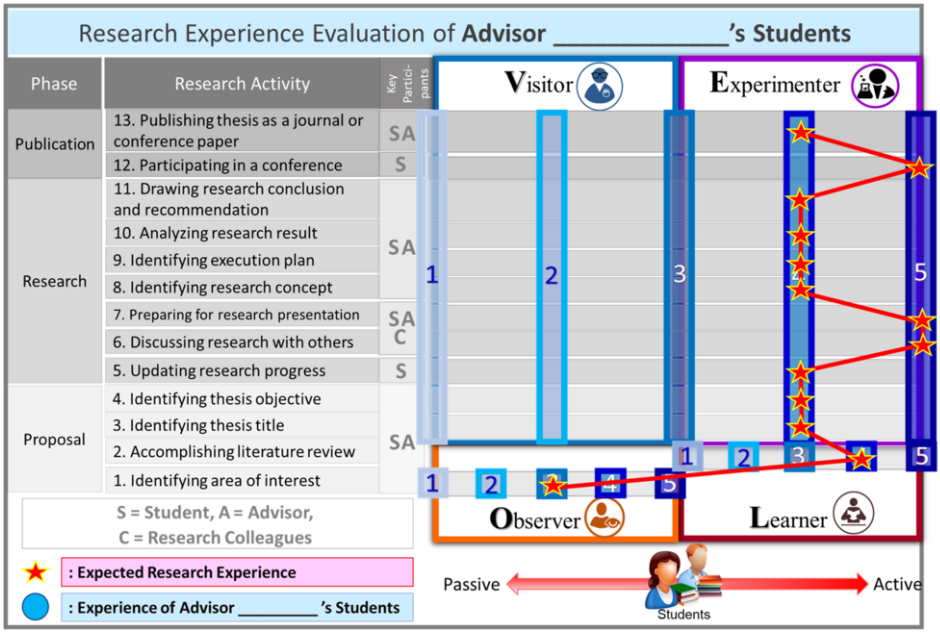

Figure 3. Assessing research experience table after completing classification research experiences.

2.2. Classify research experiences

This step begins with analyzing types of experience gained from each research activity. The 'LOVE' model (Figure 1), which consists of four blocks (L, O, V, E), is placed on the last section of the proposed table and the blocks are adjusted according to types of gained experience. Key participants of each research activity are listed as presented in the middle section of the proposed table. Number 1 to 5 are assigned to represent how students accomplish the research activities. Stars are posited on the range of no.1-5 to display the expected level of student participation to successfully accomplish each research activity.

While performing the first two activities in the proposal phase, the students have not yet started their own thesis. They absorb research knowledge by seeing how others are doing research. At this stage, they gain either observing or learning experience. During identifying the area of research interest (activity no.1), students are playing the role of observers seeing what others have been doing in various research areas; while the advisor is playing the role of mentor providing suggestion and, at the same time, directing students to the right path. Therefore, the first activity should be collaborated by student and advisor (SA).

If students are more active than their advisor such as they initiate discussion with the advisor to find out the research area, this much of such effort is represented by the number 4. Number 5 is when students seek for the research area by themselves. Number 3 is when they both equally collaborate to finalize the research area. This is the expected scenario where research area is set from the interests of both. Number 2 is when advisors are more active than students such as they provide choices to students. Number 1 is when research area is set by the advisor.

By the nature of the second activity, students are forced to be more active than the advisors and their role is switched to be the learners. The expected level of their effort lies on no.4. They have to review some existent researches and have an in-depth understanding of theories, methods, models that relate to their own works. In this activity, advisors keep doing their role as mentors.

Once students work on their own research topic (activity no. 3-13), they will be immersed in the real world of doing research. They gain visiting or experimenting experience depending on how much effort they put into these activities. It is expected that they should play the role of experimenters which means they are more active and work more than their advisors. If they play a role of visitor for these activities, their advisors have to work more than them. The example of this scenario is when students have never come up with any idea or solution for their research. The discussion between both parties is rare. Therefore, the research solutions are always generated from advisors and students keep delivering assigned works.

In all research activities, student and advisor (SA) are the key participants except activity numbers 5-7, and 12. For activity no.5, it is the responsibility of the students (S) to initiate and update their progress with advisor frequently. However, without appropriate comments and suggestions from advisors, this activity will not be successfully accomplished. Therefore, their expected level of effort lies on no. 4. Research colleagues (C) are a great resource for activity no. 6&7. Inviting them to get involved in research discussions (activity no.6) will help develop new ideas. Also, they can make useful comments for improving research presentations (activity no.7). However, students are ones who have full responsibility for these two activities. Their efforts are, then, expected to be at the highest level (no. 5). For activity no.12, students

themselves are responsible for attending a conference and presenting their research work which requires their full level of effort (no. 5).

2.3. Questionnaires set up

This step aims to acquire information on how students actually accomplish each research activity. The research questionnaires are set up and distributed to graduates. They are asked to indicate the level of their involvement in the research activities. Using activity number 8 (identifying research concept) as an example, the answer can be in 5 different scenarios: (1) all the works have been done by the advisor, (2) the majority of works have been done by the student, (3) the advisor and the student have equally contributed to all works, (4) the majority of works done by the student, (5) all the works have been done by the student.

2.4. Analyze survey results

The survey results are interpreted to be 13 connected dot positions on the proposed table. Dot's position displays the level of student involvement and its size is adjusted according to the number of students who experience that activity. The proposed table reveals individual or overall student research experience throughout the research experience journey. It is used to investigate 1.) whether the student could play the role and involve as expected in a particular activity, and 2.) whether they gained 'LOVE' research experience. These two points provide useful information for advisors to improve their supervisory styles.

3. Illustration

The proposed application was illustrated in late 2016 through an assessment of Master's student research experience in the School of Engineering, Asian Institute of Technology, Thailand. Two advisors (henceforth advisor A and B) with different supervisory styles were selected for exemplification. Some graduates from both advisors were asked to finish an online research survey.

3.1. Research supervisory styles

The two advisors have one similar principle. They both are supportive and are always available for discussion, so students can stop by anytime in a day. If students motivate themselves to have a daily meeting, they will gain more benefits. One graduate expressed in the survey that the daily meetings always gave him the confidence to do his work and ensured that he was moving in the right direction.

Working under advisor A, students might work on-campus and/or off-campus. However, they are expected to perform and deliver their own works on time. For advisor B, students have to abide by the principles of working in his research group such as daily working hours. A monthly group meeting is for updating research progress and practicing research presentations. These activities, in another aspect, force students to observe how their colleagues work on their respective researches. Also, students are trained to judge and make comments on others' works which, in return,

strengthening them to deal with some unexpected questions. It is noted that the thesis works under advisor B must be publishable.

3.2. Research survey

The survey got 33 respondents of which 67% were male and 33% were female. 82% had some research experience and 58% had some work experience before starting the Master's program. They graduated in different years from 2006 to 2015. 76% graduated on time, 18% used one more semester and 6% used two more semesters to pursue the degree. 48% were under advisor A and 52% were under advisor B. There were no differences between the 2 groups on the dimensions of research and work experience.

3.3. Survey results

The results on the comparison table (Figure 4) indicate the overall gained research experiences from 33 graduates of both advisors compared with the expectations. The graphs of the two groups lie in the same pattern. However, there are gaps in all phases between expected and gained research experiences according to the actual level of students' involvement in all research activities. In the proposal phase, students' performance reached the expected level in the first two activities. They equally collaborated with advisors to accomplish the activities. For activity no.3, the students put their effort a bit less than the advisors. Therefore, it deviated their roles to be visitors instead of experimenters and increased the span of the gap. Nevertheless, they could play the role of experimenters in the activity no.4 which results in a lesser span of the gap.

Moving to the research phase, students could play the role of experimenters in many activities, except the 8th activity where they all were visitors. Remarkably, there is a significant difference in the middle of this phase (activity no. 6&7) between the two groups of students. It was unclear that advisor A's students could play the role of experimenters. Their efforts lie in the middle area between being visitor and experimenter. In contrast, students under advisor B have the better performance and is closer to the expectation, especially for activity no. 7.

The reason for activity no.6 is the students of advisor B were working in a research group where they could easily discuss with peers. While, the students of advisor A were working individually; therefore, they had a lesser chance to discuss with peers. For the 7th activity, the students of advisor B were much more active in doing research presentations than another group. It results from the monthly group meeting presentations where students are forced to professionally prepare the slides. One expressed that "the monthly group meetings are very effective and it improves our presentation skills as well as personalities". The performances of the two groups of students were improved during working for the last two activities in this phase.

At the stage of publication, it is obvious to see that the sizes of the dots are too small and the students' research experiences contradict with the expected pattern. The reason is there were only a few numbers of students who could participate in this phase. The quality of research works, research funding, and conference dates limit students to attend a conference. For the 12th activity, advisor A's students were more active than advisor B's students. They expressed that during attending the conference, they also discussed the topics with other participants. While the other group of students was

playing the role of visitors and they just asked some questions. However, all of them did not gain experimenting experience as expected. For the last activity, only students who were under advisor A could gain experimenting experience. As discussed with advisor B, he mentioned that Master's students still need to be guided so that they can correctly form and write a research paper. They also need certain times to review and revise their papers. These are the reasons that limit the number of student involvement in the last two activities.

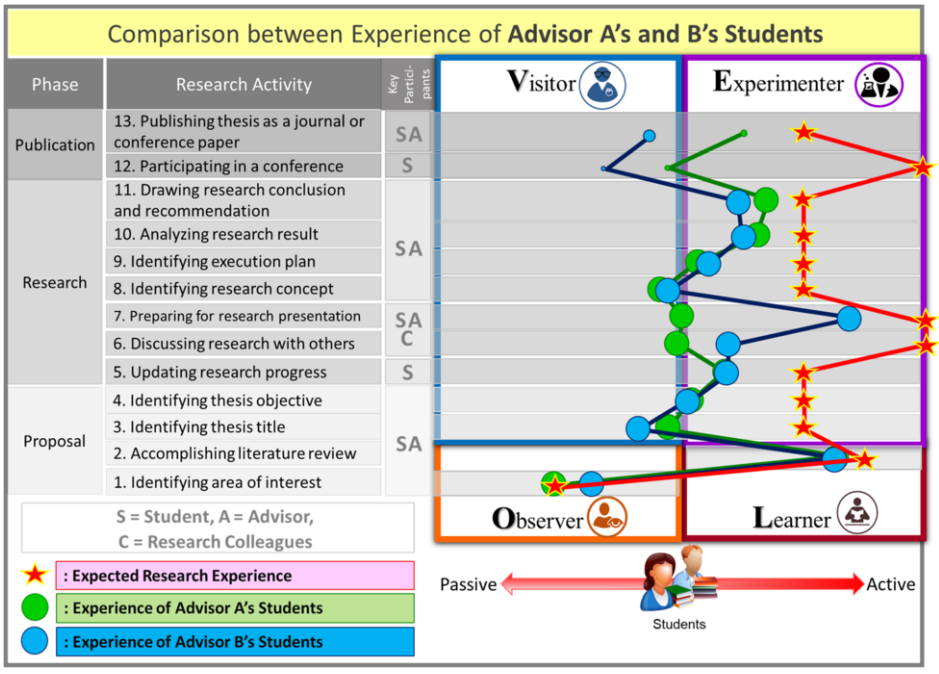

Figure 4. Comparison of research experience between advisor A's and B's students.

3.4. Suggestions

From the case study, advisors expect students to gain only three types of experience (L-learning, O-observing, E-Experimenting). V-visiting experience is still missing from their expectations, which limits students to gain the richest research experience. Therefore, providing an activity like lab visit is suggested. Visiting other research groups who work in the same research areas will fulfill LOVE experience. However, from the survey results, students expressed that they could gain visiting experience from activity number 3&8 which are unexpected experiences resulted from their low level of participation. Moreover, their gained experiences were lesser then expectations in many activities, especially for activity no. 6,7,8,12,13. In order to moderate this issue, it is suggested that students should be motivated and encouraged to be more active in those activities which may result from the supervisory styles. Another suggestion is to increase the number of publishable papers by mainly raising the bar of research quality.

4. Conclusion

'LOVE' model has been applied in higher education context with the aim of developing an application for assessing Master's student research experience in the STEM. The proposed application and table have been practically applied through a real case study. From the illustration section, the results show that the proposed application is capable of indicating the gained research experiences for all steps throughout a year of the Master's thesis works. The research results reveal gaps and assist advisors to adjust and improve their supervisory styles, as well as methods, to strengthen research skills and to give valuable research experiences to students. It is reasonable to conclude that this developed application has a potential to be applied in other fields of study.

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