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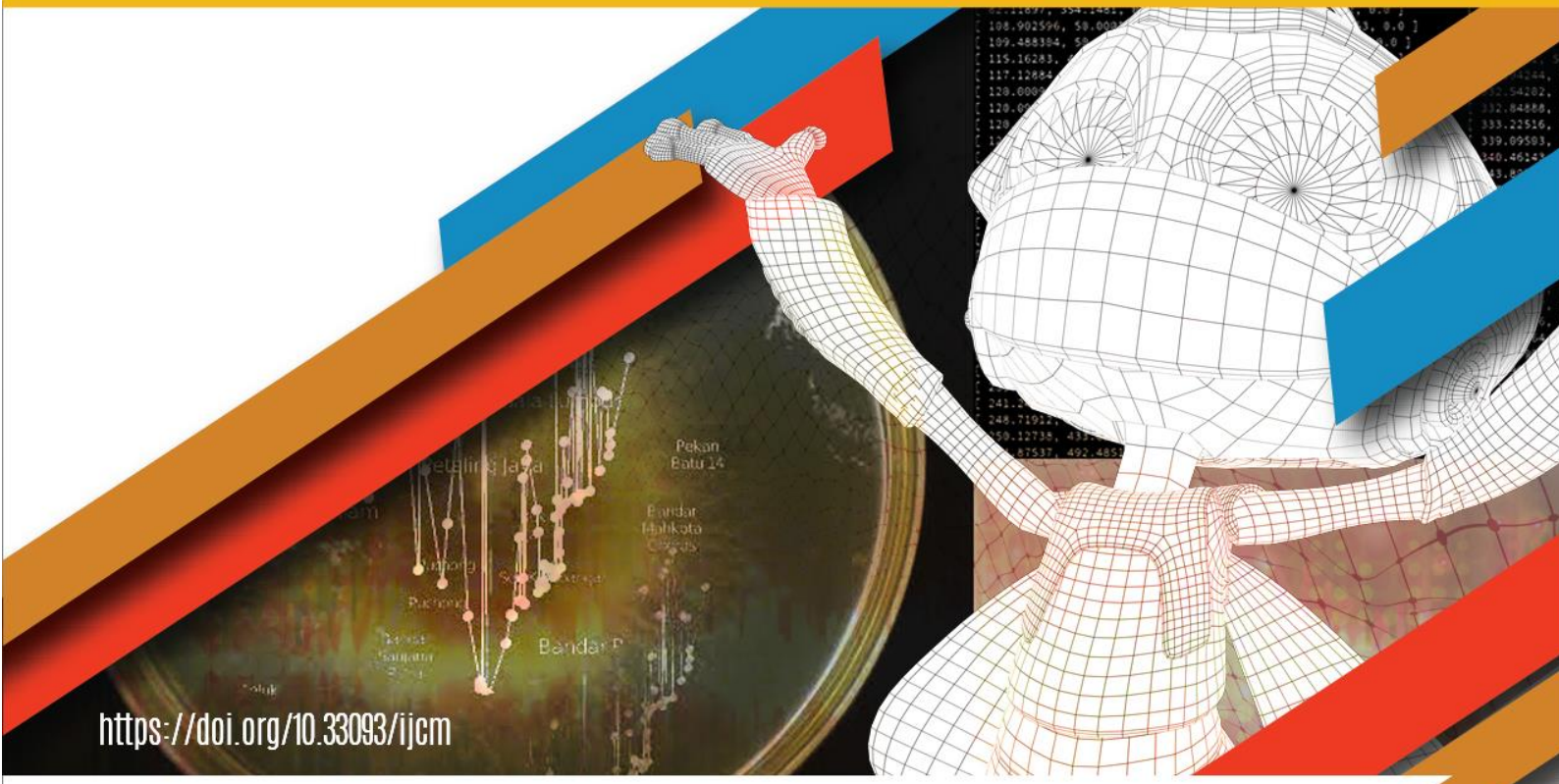

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Editorial Board

Aim and Scope

The International Journal of Creative Multimedia (IJCM) is a peer-reviewed open-access journal devoted to publish research papers in all fields of creative multimedia, including Digital Learning, Film & Animation, Media, Arts & Technology and Visual Design & Communication. It aims to provide an international forum for the exchange of ideas and findings from researchers across different cultures, and encourages research on the impact of social, cultural and technological factors on creative multimedia theory and practice. It also seeks to promote the transfer of knowledge between professionals in academia and industry by emphasising research where results are of interest or applicable to creative multimedia practices. We welcome all kinds of papers that connect academic researches with practical and industrial context in the field of creative multimedia. The scope of the IJCM is in the broad areas of Creative Multimedia following the five major thematic streams, includes but not limited to:

- Digital Learning
- Media, Arts & Technology
- Games and Virtual Reality
- Cinema and Film Studies
- Animation and Visual Effects
- Visual Design and Communication

Foreword from Digital Learning Editorial Team

Greetings from the Editors and welcome to the Special Issue on Digital Learning in the 21st century. In this Issue, we present papers from international and local researchers focusing on research papers in areas of education technology, learning analytics, e-learning, engineering, IT, business and management, creative multimedia and many other domains that seek to improve the learning process of the learner with technologies. These papers were presented in the ELITE 2019 International Conference held in Multimedia University, Cyberjaya, Malaysia on October 2, 2019, in conjunction with the 2019 IDE4TE International Exhibition on Oct 1, 2019. Themed, "Empowering Learning, Innovating Teaching Environments", this event showcased best practices of Malaysian Universities, particularly from the network of Industry Driven Education Alliance (GLU iDE4) comprising of Universiti Teknologi Petronas (UTP), Universiti Multimedia (MMU), Universiti Tenaga Nasional (UNITEN) and Universiti Kuala Lumpur (UniKL), as well as from international presenters from China, India, Bangladesh and Maldives.

The papers presented in this Special Issue centred around 5 sub-themes; 1) Innovative Pedagogies & Instructional Design, 2) New Roles of Teachers, 3) Redesigning Curriculum for Education 4.0, 4) Emerging Technologies In The Classroom, and 5) Designing Learning Spaces for 21st Century Education, and are very timely articles for readers interested in adapting technology in today's classrooms. We hope that these papers will provide further insight and contributions to the knowledge base in these fields and we hope you enjoy reading them.

Prof. Ts. Dr. Neo Mai, Multimedia University, Malaysia

Professor Dr. Neo Mai is the Director for Academic Development for Excellence in Programmes and Teaching (ADEPT) for Multimedia University, and Professor in the Faculty of Creative Multimedia, and the Institute for Digital Education and Learning (IDEAL). Prof. Mai is the Director of the award-winning MILE Research lab and founding Chairperson form the CAMELOT (Centre for Adaptive Multimedia, Education and Learning cOntent Technologies) Research Centre. Prof. Mai's research interests are in the design of constructivist learning environments, micro-learning, team-based learning and web-based education. She was the recipient of the 2014 Excellent Researcher Award, an AKEPT Certified Trainer for Interactive Lectures (Level 1, 2, 3), an HRDF certified trainer and is certified in Team-Based Learning from the Team-Based Learning Collaborative, USA.

Dr. Gan Chin Lay, Multimedia University, Malaysia

Dr. Gan Chin Lay is a Senior Lecturer affiliated with the Faculty of Business, Multimedia University. Her main research interest is in learning analytics, particularly related to technology-enhanced student-centered learning environments. Her research domains include teaching and learning issues such as student engagement, and educational technology integration frameworks.

Dr. Liew Tze Wei, Multimedia University, Malaysia

Dr. Liew Tze Wei is a Senior Lecturer at the Faculty of Business, Multimedia University, Malaysia. He is leading the Human-Centric Technology Interaction Special Interest Group, in addition to serving as the collaboration & innovation coordinator and research & innovation committee member in the faculty. His research interests and contributions fall within learning sciences, human-computer interaction, and media psychology; with a strong focus on experimental research approach.

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International Journal of Creative Multimedia

Enhancing Students' Collaborative Learning Experiences with Laurillard's Conversational Framework

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Abstract

Collaborative learning (CL) is becoming increasingly recognised as a popular pedagogical practice in higher education that promotes socialization and learning among students. However, the use of collaborative learning does risk placing too much responsibility on the learner and reducing face-to-face interaction with the educator. Therefore, there is a need for educators to find a balance in the interaction and engagement with students to help improve their perceived collaborative learning experiences. This paper presents the development of blended learning environment through the use of Laurillard's Conversational Framework (LCF) to facilitate project-based learning, mediated by multimedia and online tools. Students' feedbacks gathered indicated that students experienced meaningful learning and improved socialization when communicating and collaborating with each other. The findings showed that the LCF is very useful in helping to design technology-based learning environments with collaborative project-based activities. However, educators do need to know that factors such as students' lack of collaborative skills, issues on free-riding, student's competency level, and friendship among students are important factors in determining the effectiveness of collaboration among students.

Keywords Collaborative learning; Student perceptions; Project-based learning; Conversational framework; Learning experiences

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Introduction

Technological advancement plays an important role in influencing the change in people's attitudes towards education and how they learn. It has become an important part of higher education where students can learn, collaborate and share ideas with each other through the Internet and the ever-improving technology (Al-Emran, Elsherif, & Shaalan, 2016). The change in technology has widened the gaps in terms of the use of technology in developing students' 21st-century skills. In order to keep up with this situation, HEIs in Malaysia have started initiatives to introduce innovative learner-centred approaches to provide students with meaningful, effective learning experiences and to empower them to be capable and competent lifelong learners through combining online instruction with face-to-face sessions (f2f) that is commonly known as blended learning (BL).

In more developed countries, initiatives have been carried out in researching and introducing technology-enhanced innovative approaches in lesson delivery. They have moved from a teacher-centred approach towards a learner-centred or learner-driven approach, where learning is more about developing students holistically rather than preparing them for examination kind of education. For example, Finland introduced the multi-disciplinary phenomenon-based learning into their education system where students play an active role and are self-regulated, set their own objectives and solve problems independently and collaboratively (Symeonidis & Schwarz, 2016; Silander, 2015).

Herranen, Vesterinen & Aksela (2018) defined learner-centred approach as where the teacher holds the control of determining the choices and learning goals for the learners, although the learners are taken into consideration while the learner-driven approach is where the learners have more autonomy and independence and they take active ownership of their learning. In this study, the learner-centred approach used is as per defined above, with the exception that facilitator holds a certain degree of control on determining the choices and the goals for the learning. Students participated in this study were given the choice of choosing their topic based on certain themes while learning objectives were decided by the facilitator. The intention was to help them to become autonomous and responsible learners. On the other hand, CL is becoming increasingly considered to be an important learner-centred pedagogical practice in higher education as it promotes socialization and learning among students. It provides the opportunity for students to communicate and interact with their peers in solving problems as a group. Therefore, in this study, the learner-centred CL model developed to better engage students comprised of three key integrated components: the LCF; the project-based learning approach (f2f and online); the use of a blended learning

environment. The LCF is used to facilitate project-based learning, mediated by the web 2.0 technologies and f2f sessions. The focus is to investigate the students' perception of the collaboration and communication processes between the facilitator, students, their peers, and technology. The learning was designed around a project as a performance of understanding to provide a platform for students to interact, communicate, and collaborate with their team members, other teams, and the facilitator.

Literature Review

This literature review discusses on CL, LCF and project-based learning. Other than that, it provides an understanding of the use of LCF to support the implementation of collaborative project-based learning.

Collaborative Learning

CL is a collection of strategies used to promote collaboration between students in small groups to optimise their learning (Asterhan & Schwarz, 2016; Redes, 2016). The learning environment emphasizes that each group member needs to have a perception that they are interdependent in achieving the goals of the given group. It requires students to engage in constant communication, establish mutual understanding, dispute opinions, and to negotiate solutions together (Boling, Hough, Krinsky, Saleem & Stevens, 2012; Chu et al., 2017). Learning occurs when students learn from each other through these interactions while utilizing resources made available through the use of technology (Scott, 2015). They are supposed to also learn to communicate their ideas and accept criticism for their ideas. Students' communication skills also play an important role in collaborative learning. It provides opportunities to resolve challenge and differentiation, enhances students' confidence level and self-esteem as well as strengthens their social skills. Students who develop good social skills stand a better chance of adapting to the workforce in their later life as they have the ability to deal with people and have a sharper Emotional Intelligence (EQ) (Binsaeed, et al., 2017; Davis, 2019).

However, many students are unaware of the values and strategies that make effective collaborative learning and they often have misperceptions on collaborative learning (Chu, Zhang, Chen, Chan, Lee, Zou & Lau, 2017). The most common barriers to the student collaboration process are mainly due to students' lack of collaborative skills, perception on student's competency level, issues on free riding and the friendship among peers (Le, Janssen & Wubbels, 2017). The lack of interpersonal and teamwork skills may also have a bad effect on the individual and collaborative learning experiences within a team (Shimazoe & Aldrich, 2010; Le, Janssen & Wubbels, 2017; Stover & Holland, 2018; Chang & Brickman, 2018). Other than

that, collaborative learning will only be effective when students are skilled in collaboration and the lack of it may lead to the issue of free-riding. The students' perceptions of the competency of their peers may also limit their collaborative learning. Students at the low-competence level are usually hesitant or demotivated in participating actively and are often overlooked, while their peers at the high-competence level are more likely to contribute and appear to ignore the contributions of peers they viewed as low-competence. Contrary to common beliefs, the friendship between students may not necessarily improve collaborative learning in a group (Le, Janssen & Wubbels, 2017). Students' resistance to collaborative learning is another obstacle to the process of student collaboration. Tolman and Kremling (2017) mentioned that student resistance is rather a motivational state that can be influenced. Such resistance is motivated by internal and external factors such as students' previous negative experiences with collaborative learning, students' own self-awareness of how they learn, and how they perceive education and knowledge (Stover & Holland, 2018). Studies also found that many university students were reluctant to amend other's works or comment upon other's ideas. They tend to focus on their own work, avoid criticism and conflict to aim for group harmony, and considered interfering with their peers' work as inappropriate (Nguyen, Terlouw, & Pilot, 2005; Chu et al., 2017). The students' reluctance becomes a hindrance to engage them in collaborative activities to optimise their learning. To enhance interaction and collaboration among students, peers, and facilitators, there is a need to have a strong integration of activities for both offline and online environments that would need to be created. As such, combining technology, pedagogy and a framework of learning that emphasizes active learning through conversation and acquiring knowledge through experiencing things would help develop more dynamic and engaging learning environments.

Laurillard's Conversational Framework (LCF)

Diana Laurillard developed the LCF to provide a guide to support teachers in designing learning environments with ICT (Laurillard, 2012). It involved having a balanced set of learning experiences for students and a focus on communication and conversation between students and teachers as well as between students and their peers in the learning process (Laurillard, 2012). The focus of the framework is to help educators to think about teaching and learning from the learners' perspective. In LCF, the learner is at the centre of the framework (see Figure 1), and learning is an activity that developed from concepts and practices. In this framework, concept development is done through the process where teachers and learners communicate about concepts and learners doing the same with their peers. This is shown at the top section of the LCF. Then, the teacher and learners could model and share their practices through actions and

feedbacks in a learning environment created by the teacher. Learners could also integrate their concepts and practices when facing a challenging learning environment.

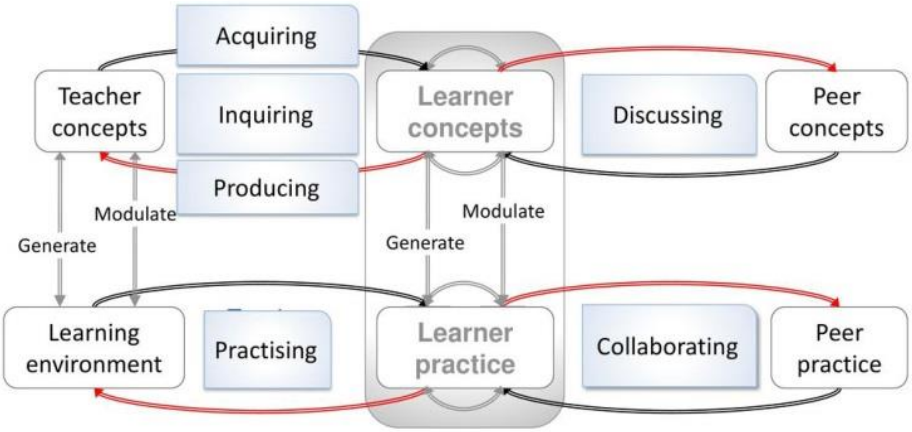

Figure 1 Laurillard's Conversational Framework (Laurillard, 2012)

The framework identified six learning types to categorize learning activities that could be introduced to help learners in their learning process. The six learning types identified in the framework are: learning through acquisition, inquiry, discussion, practice, collaboration, and production, where each type of learning activity is a cycle between the learner and their teacher, or the learner and their peers. The combination of these learning types would help to provide the best possible learning experiences for the learners.

a) Acquiring

This is where learners carry out activities such as reading from books or websites, listening to a lecture, and watching demos or videos to help them develop concepts.

b) Inquiring

This is where learners come out with questions and searches, explores, compares and critiques materials that represent the concepts and ideas being taught or created. It enables learners to continue developing the conceptual process.

c) Discussing

This is where learners express their ideas and concerns, share ideas, challenge and respond to the teacher's and/or peers ' ideas and arguments.

d) Practising

This is where learners adapt their actions to the purpose of the task and use the feedback to develop their next output. Feedback may come from self-reflection, peers, the teacher, the activity itself, or even from external actors from the personal learning network of the learner.

e) Collaborating

This is where learner engages in production together with their peers to produce a shared output such as design or diagrams, reports, etc. Learners need to negotiate the ideas and practices with their peers until they agree on a solution. The idea is about having them debate, challenging each other and providing feedback, integrating and developing concepts and practices to get the best output that they can.

f) Producing

This is where learners integrate things they have learned and practised and to express it through generating an output to be evaluated by the teacher.

Project-based Learning

Project-based learning (PBL) is a pedagogy that helps learners to develop their own understanding by doing, creating, and demonstrating their new skills, and helping them to acquire knowledge and useful skills (Barron & Darling-Hammond, 2008). This is done through a learning environment where learners are to collect information and initiate a project based on the questions provided by the teacher or themselves - inquiry and guided by a driving question; establish a group, discuss possible projects and form a project plan - learner voice and choice; execute the project – critique, revision and reflection; present project results and conclusions - public audience (Li, 2018; Bender, 2012; Krauss & Boss, 2013). This pedagogical approach helps to promote collaborative learning by having learners develop knowledge and skills required to accomplish a project in a real-world context. It helps to promote learner collaboration by working on a project as a performance of understanding (Poonpon, 2017).

Several studies have established that the PBL approaches did affect learners' interest and self-efficacy positively (Bilgin, Kar-akuyu, & Ay, 2015; Brown, Lawless, & Boyer, 2013; Holmes & Hwang, 2016). This is reinforced by the findings that learners appreciate the experience of engaging in authentic projects (Sababha, Alqudah, Abualbasal, & AlQaralleh, 2016; Tseng, Chang, Lou, & Chen, 2013). Another research found that PBL helps slow learner students in improving their self-efficacy (Zainudin, Mohamad Ashari,

& Kosnin, 2017), However, there are some issues linked to the use of the PBL approach in providing effective teaching and learning. This includes issues such as teachers' experience, knowledge, skills, and learners' lack of collaboration among the group members (Zhang, 2019; Song, 2019; Sadrina, Mustapha, Ichsan, 2018; Mohd Hawari & Mohd Noor, 2018). Therefore, there is a need for a framework to guide teachers and learners in optimising the potential of PBL in enhancing learning.

Methodology

Designing the LCF Supported Project-based Learning Environment

LCF seems to be a good fit framework to support the implementation of a project-based learning approach that supports the teaching and learning needs in higher education. It enables learners to be involved in doing, creating, demonstrating their new skills, as well as acquiring knowledge and useful skills while helping them to understand the learning content by having them to reflect and adapt information regarding their tasks, and by input from the teacher and their peers. In implementing the LCF to support PBL, a course from Tunku Abdul Rahman University College was used in this research. The participants (N=78) were second year undergraduates doing the Bachelor of Creative Multimedia degree course from the Faculty of Communication and Creative Industries. The selected course for the study required students to create a database-driven website using server-side scripting, web and database servers, and multimedia tools such as Adobe Photoshop, Adobe Illustrator and Brackets IO within a given timeframe of fourteen weeks to complete the project. The course was conducted in a blended mode where it combined the f2f sessions with interactive materials and videos posted online to allow students to learn at their own time online, a web-based project that is to be developed, collaborative activities carried out via social communication tools, Google Suite for education, and web-blogging to enable students to record and communicate progress of the project, as well as to collaborate online with their team members on the assigned project. The course project was group-based; thirty groups with three to four members each were formed and thirty group leaders were selected for each of these groups. The students were then required come out with a team contract, as well as to prepare a detailed proposal of their fully-functional database-driven website from a list of suggested topics, which they were to develop during the second half of the semester. The groups were required to present their progress to gather feedbacks and suggestions from all students during the checkpoint presentation or sharing sessions during the semester. These sessions were also used as an opportunity for the students to learn from each other on improving their respective outputs.

Each group was required to come out with a group blog to document their project development progress using Google Sites, which is part of the Google Suite for education made available to the students. The blog, which was monitored by the group leader, had to be updated on a bi-weekly basis, up to the completion of the project. The lecturer could get a general idea of the progress of the project and ensure that all members of the group are involved, spot possible problems and interfere if necessary to improve the learning process by reading students' progress records posted on the blog over time and noting their development. The students were then asked to evaluate how they perceived the process of collaborative learning of their respective groups. At the end of the duration of the project, each group was to present their final work to gather feedback and critiques from all students during the final work presentation sessions during the final week of the semester.

Table 1 Technology tools and learning activities.

Tool	**Learning Activities**
Blog	Each group maintained a blog for their project using the Google Sites, which is part of the Google Suite for education made available to the students. The blog had to be updated on a bi-weekly basis, up to the completion of the project. The group leaders were given the task of monitoring their respective group's blog. The blog is used to describe the tasks performed by the group members and the problems they encountered informatively, reflecting on their learning experience, as well as their findings and solutions.
Collaboration	Each group used the Google Suite for education tools to share and work on files collaboratively. This was used as the group's virtual working space for the project that was accessible from any devices online. This facilitated the organisation of information and collaboration where group members could share information and work together on the project online.
Common Learning Platform	The Google Classroom, part of the Google Suite for education, was used as a common platform for all groups to communicate with the lecturer. The lecturer organised and shared materials to assist students in their learning on this platform. It was also used for the lecturer to post announcements and instructions to the groups, and students could also post questions related to the project.
Informal Communication	The Messenger and Whatsapp applications were used as an informal communication platform for the groups to discuss, exchange ideas, coordinate, and undertake decision-making.

Figure 2 illustrates the mapping of Laurillard's Conversational Framework to the class design to support the project-based learning environment.

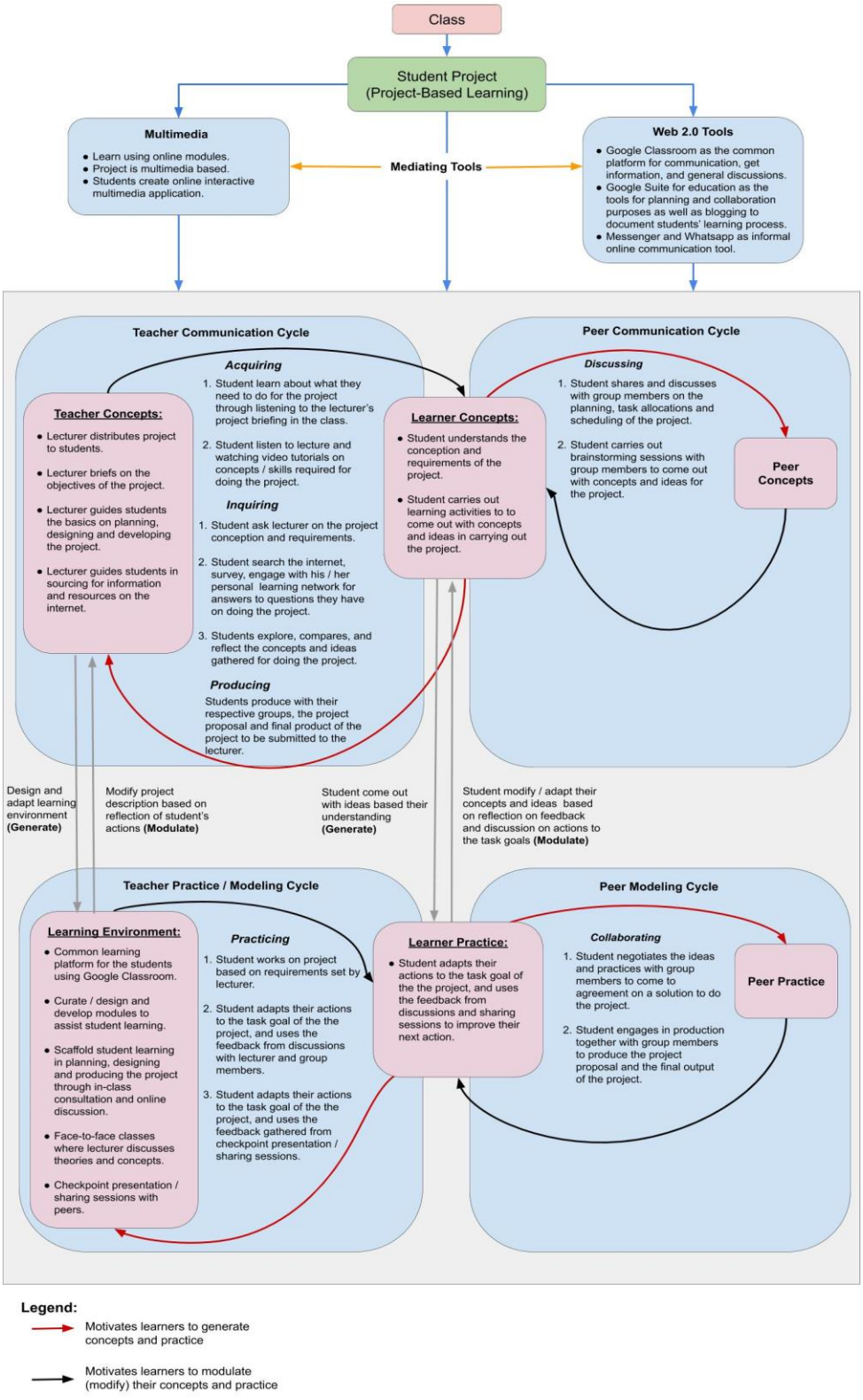

Figure 2 Mapping of Laurillard's Conversational Framework to the Class Design

Figure 3 illustrates an example of a group's project of a student portfolio social website, while Figure 4 shows the group blog that the group has created for the project.

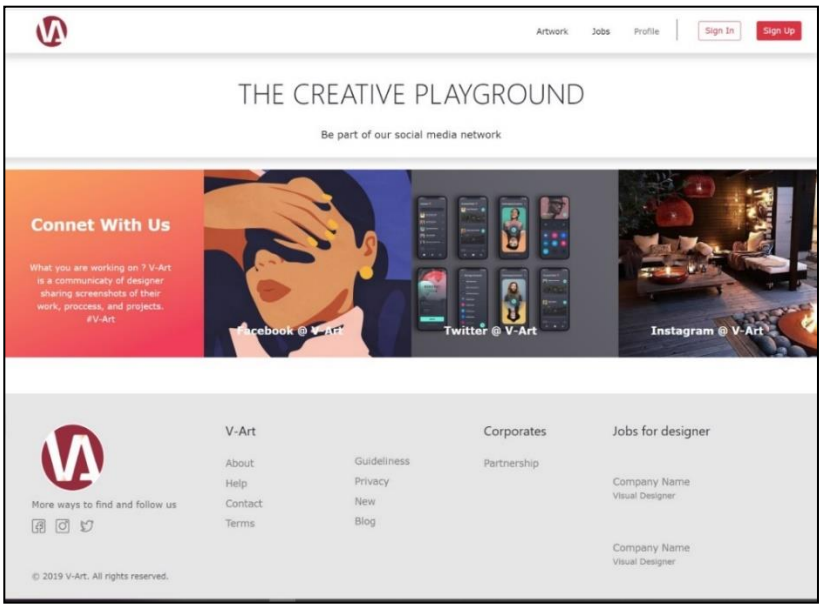

Figure 3 Example of a Group's Final Work – A Student Portfolio Social Website

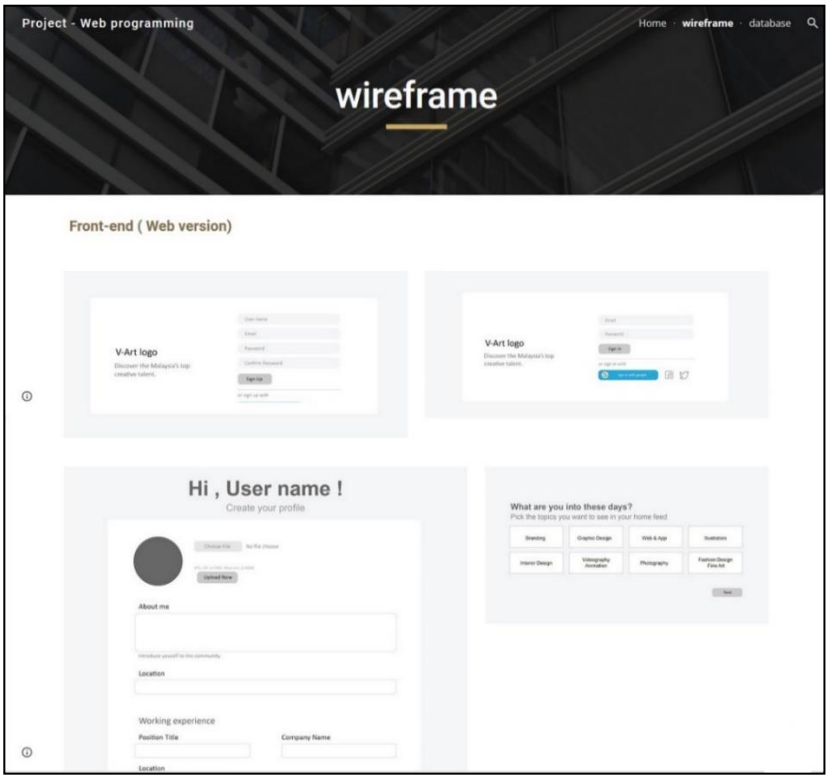

Figure 4 Example of a Group's Project Progress Blog

Results

Students were given a survey questionnaire to assess their perceptions of their collaborative learning experiences in the learning environment. The questionnaire consisted of both open-ended questions and a five-point Likert-scale questionnaire. Their responses were gathered through the open-ended questions to obtain deeper insight into their experiences, as well as to explore their relationships with their peers, the lecturer, and the technologies they were exposed to.

Table 2 Means of survey items on teamwork & collaboration

Items in the survey (N=78)		Mean (M)	Std. Deviation (SD)
1	My teammates have worked hard for the group	4.346	0.6412
2	My teammates have performed well as a group	4.154	0.7572
3	My teammates have worked responsibly so the group will reach the goals and perform the tasks	4.256	0.6920
4	My teammates have organised and coordinated themselves efficiently	4.064	0.7786
5	My teammates have prepared their share of the work successful in meeting the desired result	4.167	0.6530
6	My teammates have encouraged each other in carrying out the tasks	4.026	0.7891
7	My teammates have positively solved the conflicts and problems in the group	4.051	0.7542
8	My teammates have accepted criticism and suggestions positively	4.346	0.7355
9	My teammates have collaborated simultaneously in the performance of the tasks	4.179	0.7515
10	My teammates have cooperated with each other in the performance of the tasks	4.295	0.6858
	Cronbach Alpha = 0.948		

As shown in Table 2, students were measured on their perception of their group teamwork spirit in carrying out their project, their willingness to work with each other, as well as their perception of the overall quality of their collaboration. Many of the students reported that they have performed well as a group (Item 2, M=4.154, SD=0.7572). Many of them reported that their group members have worked well together in terms of organising, coordinated, and completing their tasks successfully in meeting the desired

result (Item 4, M=4.064, SD=0.7786; Item 5, M=4.167, SD=0.6530). Results also showed the majority of the students agreed that they can work with their respective team members (Item 10, M=4.295, SD=0.6858) and many of them encouraged each other in the team (Item 6, M=4.026, SD=0.7891). The students also reported that they handled issues such as problems, conflicts, criticism, and suggestions, in a positive manner (Item 7, M=4.026, SD=0.7891; Item 8, M=4.346, SD=0.7355).

Table 3 Students' comments on teamwork and collaboration

Selection of students' comments
On collaborating with group members: "Pretty Good, easy to understand each other" "I think it is good to work together as a team." "We get along very well and solve the problems we face together." "We both get along with each other because we did work together as a group during our diploma time and everything went pretty good." "very well cooperated" "Appreciate for my group members and my instructor who willing to help us in experience sharing also logical thinking that we must go through within it." "I like my member and the instructor. We have done the project together well and the instructor has given suggestions on the project." **On what has been learned in collaborating with group members:** "Cooperation among group members is very important. We should approach the lecturer or do research when there is something we confused to or do not understand with." "Planning and teamwork is very important" "Learned to overcome issues by working together." "Communication. Having good communication will create good teamwork." "The importance of teamwork and how to get along with group mates." "Teamwork and conversation are important." "Learned how to lead a team and planning" "Learned how to communicate with each other and the importance of voicing suggestions and ideas." "Time management is very important."

The findings of the open-ended questions showed that students were able to meet the learning objectives through the collaboration and interaction process with the lecturer and their peers. Overall, many of the students reported that planning, communication, time management, and teamwork plays an

important role for them to complete their project successfully. These were supported in their comments as shown in Table 3.

Discussion and Conclusion

Overall, there are very optimistic perceptions and attitudes of the learning environment and the process of project development based on the results obtained from the analysis. This provides positive support for the use of dialogue and conversations with project-based activities in technology-based learning environments on improving students' collaborative learning. Results showed that the lecturer had a significant role in the learning environment, a role where the lecturer was that of a mentor, facilitator, consultant or coach to the students. This includes giving out clear instructions to students, facilitates collaborations between students and their team members, and encourages students' learning by providing feedback and support to student learning in f2f sessions and online interactions, monitors the student's learning process through the use of blogs and provide formative assessments as well as to evaluate the performance of the students during the project development. Similar to what other studies found, there were students who were unaware of the values and strategies that make effective group-based collaborative learning. It was mainly due to the lack of interpersonal and teamwork skills among the students. Another common issue found in the study was that students at the low-competence level were demotivated in participating actively in the group tasks as they felt they are not good enough. Therefore, educators need to be aware of how factors such as students' lack of collaborative skills, issues on free-riding, student's perceived competency level, and friendship between students play an important role in fostering the quality of student collaboration.

In conclusion, this study showed that Laurillard's Conversational Framework (2012) is an effective framework for designing a learning environment that would foster better collaborative learning experiences among students. The incorporation of project-based activities in technology-based learning environments motivated students to work together and interact with each other, as well as allow them to enjoy the learning process. However, it is absolutely important for educators to develop both the technical skills and facilitating skills in guiding students on their collaborative learning through the use of LCF to facilitate PBL. It is significant for the institution to train its lecturers to develop both the technical skills and supervising skills. These skills would help to reinforce educators' facilitating skills, and enhance educators' collaboration and communication skills to nurture students' creativity and problem-solving skills.

Although the study did reach it's objectives, there were some potential limitations that should be noted. First, the study was carried out on a student sample limited to second-year bachelor degree multimedia design students. First-year bachelor degree students and diploma students were excluded. Second, the study was carried out over a period of a semester in a university. In future, it is recommended that the study to be expanded to involve more students from different faculties and programmes as well as over a longer period of time. Nevertheless, the study results indicate positive support for educators who seek to improve student interaction in a technology-based blended learning environment to improve their collaborative learning experiences.

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