

Peer Assessment - A Way to Enhance Students' Learning Capacity

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ABSTRACT

The goal of the EMVITET project is to support lecturers in creating a student-centered and competence-based learning environment in the direction of Education 4.0, whereby assessment is considered a way of learning. This article explains the importance of “assessment as learning” and illustrates how to implement this concept through five cases from project partner colleges and universities, where peer assessment was implemented in class sizes with a maximum of 70 students. All case descriptions follow the same structure: First, contextual information and rationale of peer assessment are given. It is followed by a description of how peer assessments were organized. Finally, the observable impact was also mentioned with available data. Through the analysis of typical cases, the authors offered key principles for implementing peer assessment successfully: (1) Clarify the purposes and expectation of peer assessment; (2) Pay enough time and attention to the design of the evaluation criteria; (3) Anonymize peer assessment so that students feel comfortable evaluating each other; (4) Ensure multiple peer assessors to reach a higher reliability and validity - ensure each student is assessed by at least two or three fellow students. More importantly, the article also suggests: the lecturer gives students more responsibility and control, and the degree of the giving responsibility and control shall match the learning goals and level of students' prior knowledge and their learning ability. With the wonderful impacts of peer assessment, most students expect the method to be applied widely and it is highly recommended to be continued in the near future.

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1. Introduction

Assessment guides and drives students' learning. What and how students learn is largely determined by their expectations about the assessments (Clement & Laga, 2005; Lizzio, Wilson, & Simons, 2002). Given the huge impact of assessment for teaching and learning, EMVITET (Empowering Vietnamese VET teachers for transformation towards Education 4.0) project pays explicit attention to it. In order to realize the project goals, that is, to support lecturers to create student-centered and competence-based learning environments towards education 4.0, assessment is perceived as a way of learning. The goal of this article is to explain the importance of “assessment as learning” in Education 4.0 and illustrates how

to implement this concept through five sample cases from project partner colleges and universities, where peer assessment was implemented with digital tools with relatively small class sizes.

Assoc. Prof. Dr. Nguyen Cong Khanh (Director of the Center for Quality Assurance of Education, Hanoi National University of Education) has said: “The weakest point of educational assessment in Vietnam today is that the philosophy of assessment has not been clearly defined: what is assessment for, why should it be assessed? What is the purpose of assessment and assessment to promote and form students' abilities?... as well as in assessment, teachers often evaluate through grading without giving feedback to learners” (Khanh, 2016). This quotation indicates the current assessment pitfall in Vietnam is that many teachers lack conceptual insight in the potential functionalities of assessment. This brings the necessity to illustrate the three well established assessment concepts from literature: “assessment of learning”, “assessment for learning” and “assessment as learning”.

Assessment of learning

Assessment of learning (“Assessment”, 2019), often referred to in the literature, summative evaluation, focuses on the judgment function of assessment. What has the student learned and to what extent does this correspond to the predetermined learning objectives?

Assessment for learning & instruction

The concept of “assessment for learning” emphasizes formative evaluation or formative feedback (Gikandi, Morrow, & Davis, 2011). The focus of assessment is to find out where a student stands with regard to the formulated learning objective and use feedback to support learning: "Feedback gives students insight into their own learning process so that they can adjust so that learning becomes more efficient. "

Assessment as learning

In education 4.0 the assessment is seen as learning. The emphasis is on *building students' capacity to make accurate judgements on their own learning*. To make self-judgements students not only use the information and feedback from the assignments or tests or learning activities offered by lecturers or tutors, but also are able to create their own strategies and self-test tasks/questions in monitoring accurately how effectively they learn and how well they master the targeted content. With ‘Assessment as Learning’ the ultimate purpose is to *make students adaptable, flexible and independent learners & decision-makers* (L. Earl, 2007). This puts students in the center of learning. Moreover, not only subject-related competences are needed for accurate monitoring, adaptation and self-judgment, students are also expected to develop lifelong learning ability (learn how to learn).

Two essential lifelong learning ability are: being able to use *feedback effective to self-regulate learning*

- Effective feedback: assessment as learning meaning that students are motivated, can and be able to use feedback to make adaptations in their understanding and to decide their next step in the learning process (L. Earl, 2013). To be able to do so, it implies that

- Students understand and internalize the assessment criteria and standards,
- Students are open for feedback as they understand the benefits and how to use the information to direct their learning,
- More specifically, students can handle feedback from multiple perspectives (even sometimes this feedback may conflict with each other).

- Self-regulated learning: In an effective self-regulated learning process, students need to reflect upon, monitor and adapt their thinking processes (cognitive activities) to relate information to prior knowledge and construct new learning (L. Earl, 2013; Lee & Mak, 2014). Reflection and monitoring are key for successful life-long learning.

To achieve the aforementioned points, peer assessment can be seen as an effective way to develop students' learning ability - students are in charge of monitoring, judging and reflecting on each others’

performance and really become the critical connector between assessment and their own learning (L. Earl, 2013).

Peer assessment

In the literature, peer assessment is defined as a procedure whereby students, according to prior evaluation criteria and standards drawn up (by the lecturer or in consultation with students) indicate the extent to which fellow students ('peers') have achieved the learning objectives (Dochy, Segers, & Sluijsmans, 1999).

As mentioned before, the EMVITET project strongly emphasizes the essence of students' learning ability of monitoring, judgment and adaptation ability for life-long learning in Education 4.0 (Kunnari, Jiang, Myllykoski-Laine, & Thuyen, 2021). Peer assessment can be a promising way to teach students to play the role of assessor in order to achieve deeper understanding and advanced learning (Lee & Mak, 2014).

Pitfall and challenges

One shall be aware that it is NOT for granted that the potential benefits of peer assessment can always be reached. Several social processes might influence peer feedback.

- Friendship or other power relations may influence how critically students assess each other.
- Students' perceptions: if students do not see peer assessment as an effective learning approach, or trust their own ability for assessing others (Pearce, Mulder, & Baik, 2009), they may not be happy to spend time and energy giving good feedback. Students also often doubt whether their peers are able to give them feedback.

The significance of this study is to use example cases to illustrate how in daily teaching practice, attention can be devoted to two essential aspects of assessment for life-long learning ability development through peer assessment: effective feedback and self-regulation. Moreover, recommendations are given for successfully implementing assessment as learning.

2. Materials, Methods and Results

2.1 Research Methodology

Five peer assessment cases organized in 4 EMVITET project partner institutions between 2020-2021 were reported. These cases were based on voluntary reporting. The qualitative and quantitative data reported were collected by co-authors with different survey instruments.

All case descriptions follow the same structure: First, contextual information and rationale of peer assessment are given. It is followed by a description of how peer assessments were organized. Finally, the observable impact was also mentioned with available data.

2.2 Case study results

Case 1

Context & rationale

In the school year 2021, online assessment (Truong & Aves, 2021) and project-based learning were applied in a number of courses (students/per course: 30~50) at Lac Hong University: Mobile device programming, Linux operating system, open source software development, Java Programming. Peer assessment was used for two purposes: (1) enable students who had not yet been involved in projects to observe how project-based learning works and (2) encourage students to learn from each other's project work. It was expected that via peer assessment, students would more actively listen to all project reports and critically review them.

Organization

To support the peer assessment process. Rubric (the grading criteria) was announced by the teacher at the beginning of each course. At the end of each course each group was requested to ask questions and give advice to the reports of other groups. To encourage students to listen and ask insightful questions,

the teacher also gave detailed instruction and deployed two stimulation strategies: 1. Require all students in the class to be present (get attendance points) and 2. Individual points rewarding: the more insightful questions a student asks another group, the more points this student can gain for his/her own (the total score = individual points + project points). Moreover, students also function as assessors- they grade each other's projects based on the group projects presentation using the Rubric announced at the beginning of the course.

To implement the aforementioned peer assessment, teachers used a number of interactive tools such as mentimeter and Discord. Discord (DC) is a free phone or computer chat, video or messaging application. During the group's presentation, students used this tool to ask questions and make comments. To facilitate the communication online, teachers created a reporting thread per project so that students can discuss the topic while the group was presenting. During the group reporting, the presenting team shared the questions asked by peers and answered them. After the project presentations, students also needed to assess the project. The teacher sent a link of the recorded questions raised and their corresponding answers so that all students can score the project quality using the available criteria. Below is a screenshot to demonstrate how the peer assessment is done via mentimeter (see figure 1). This assessment slide was prepared by the teacher in advance. On the left of the figure, the 3-students image and the title indicate which team/project it was. On the right side, each bar presents a criteria, the number on the bar is the average score given by peers.



Figure 1. The audience, after asking questions, giving comments and receiving answers from the reporting group, will grade the report group based on the criteria given by the teacher.

Evaluation

In order to assess students' perception of peer assessment and how well they learnt from the peer assessment process a survey was conducted with 189 students. The results are shown in Table 1 & 2.

Table 1. Students' responses to the question "Through asking questions, comments (peer-assessment), what do you think you have learned from other groups/others?"

Item	Result
New knowledge beyond the lecture	102 (54%)

Own group's presentation and question-answering style	101(53,4%)
Learn through your own questions for other groups	93(49,2%)
Learn through new explanations from other groups and teachers	106(56,1%)

Table 2. *Students' responses to the question 2 "Which peer-assessment method do you prefer?"*

Criteria	Result
Ask and give suggestions to other groups and vice versa	146 (77,21%)
Evaluate by criteria (using applications such as: menti, pollev...)	72 (38,1%)

Case 2

Context & rationale

Digital Pedagogy in Education 4.0 has been applied at HCM Industry and Trade College (HITC) and shown very good results in teaching and students' engagement (Nam & Thang, 2021). Despite scientific documentation on the potential benefits of peer assessment, it is still rare for lecturers to implement it. As the students indicated on a survey that they appreciated and welcomed peer assessment, the peer assessment was integrated with multiple teaching and learning activities of a bachelor soft-skill course (Nrs=50).

Organization

During the course, various learning activities were organized. Students were divided into groups with 5-7 members. These are rather stable working groups throughout the course. However, for some particular topics, to help students develop their collaborative ability with different people, they are also from time to time assigned to new short-term working groups randomly.

Depending on the content and assessment purposes, students worked in groups with the same content or each group worked on different parts of targeted learning content. For both types of groups, peer assessment was used. Within the temporary random groups, group members could vote openly for 1 or a few best students (criteria such as "Students' attitude when participating in teamwork- initiative, positive, focusing, listening and respecting others' opinion; the quality of given ideas for group and Strengths to develop and weaknesses to overcome"). Students' vote results were used as extra points given to the nominated individuals in addition to the points the group gained based on their group work products. Within the fixed groups, students have worked together throughout the course so they got to know each other well enough to give comments (formative assessment) as well as giving points (summative assessment) on each other's work. For instance, in presentation activities, peer assessment was used to stimulate groups to give feedback and evaluate others' presentations. The peer assessment results can serve as baseline points; a lecturer can flexibly add extra points based on lecturers' judgment on individual or group work.

Evaluation

In order to assess students' perception of peer assessment and what they learnt from the peer assessment process a survey was conducted at HITC (N=61). Below is a brief summary of the survey results.

Question "In your opinion, which skills and attitudes do peer assessment methods help you develop?"

The students highly appreciated communication skills (70.5%), teamwork skills (63.9%), fair assessment (62.3%), critical thinking skills (57.4%) and responsibility (55,7%) that they received from peer assessment.

Question “In your opinion, which of the following factors affect the quality of learning when applying peer assessment?”

Students indicated "Orientation and support of lecturers" as important (60.6%) – this once again confirms that the teacher's organizational role in the classroom is very important. In addition, the characteristics of the subject were perceived as a second important factor (54.1%) – learning activities that require exchange and critique among students are most suitable for using peer assessment.

Questions “How satisfied are you with the subjects where peer assessment is applied?” and “Do you want to take part in courses that apply the peer assessment method in the near future?”

Up to 88.5% of students answered satisfied/very satisfied and 82% of students wanted peer assessment in the near future.

Case 3

Context & rationale

Through the EMVITET project, the peer assessment was widely applied in the courses for the second-year students at the Faculty of Electrical-Electronic Engineering of HITC (class size < 50 students). The main reason for using peer assessment *was* that the assessments at HITC were quite heavy and stressful for students. Students mainly focus on getting good grades. Not enough attention was on self-assessing what they have learned and done after completing the course. In order to change this, peer assessment was implemented for stimulating learning, particularly for encouraging effective self-study.

Organization

The peer assessment was applied for theory, practice or integration (blended) courses. In the first week of a course, the evaluation methods, assessment criteria and grading policy were clearly communicated together with the *assignment* announcement. The assessment areas were in line with the course learning outcomes. To ensure successful peer assessment and group work, students are divided into small groups with at least one good student. Lecturers formulated the criteria on a Google Form to distribute the information. Moreover, peer assessment was always combined with self-assessment and lecturers assessment to ensure the reliability and validity of assessment results.

Evaluation

At the end of the course, a survey was delivered to get the students’ responses, the results were shown in table 4.

Table 4. *Students’ responses to the the peer assessment*

Criteria	Result
Students felt more confident, active and interested in the courses	42/50 (84.0%)
The lessons were better understood	41/50 (82.0%)
Students were interested in learning and increasing their self-study ability	39/50 (78.0%)
Students needed short-time for reviews before the final exam and felt less stressed for the exam	44/50 (88.0%)
Students felt satisfied and comfortable with this way of assessment	43/50 (86.0%)

For the lecturers, the load of preparing for the final exam was significantly reduced. The lecturers also gained more insight of students' learning process thanks to feedback generated from the self and peer assessment.

Case 4

Context & rationale

At Ho Chi Minh City University of Technology and Education, the course of Organic Chemistry (2 credits) was applied for the freshmen students with a class size of a maximum of 70 students. There were multiple forms and compositions for calculating the total mark of this course, such as formative assessment (including homework, mindmap, 15 min chapter test, midterm test, and presentation) and summative assessment. One of the course assignments was a group work presentation. For a long time, this activity had been evaluated only by a teacher. When the teacher plays a role as the sole assessor, there are some disadvantages. The most commonly observed issue was that only a presenting group focused on their presentation, other groups were often still busy preparing their own work or doing other tasks. Through the EMVITET project, various assessment methods have been introduced and shared (Trang et al., 2021). Seeking ideas about assessment methods from the workshop organized by EMVITET project, the peer assessment method was considered to apply for this case.

Organization

At the beginning of the course, the class was divided into about 24 groups, with 3 students in each group. Each group chose a topic and prepared a presentation. The lecturer explained clearly about the evaluation method and showed the rubric form with assessment criteria. The final mark was calculated based on the composition of the lecturer's mark (50%) and the students' mark (50%).

Evaluation

Using the peer assessment method, the students took an active assessor role (giving feedback & grading) and benefited more from the assessment for learning. They gained a better understanding of the information from each others' topics: As peer assessors, they were more attentive to the errors from peers' works, and also learned to avoid the mistakes themselves. Furthermore, the students found strong and interesting points from peers' presentations. Through the peer assessment, they improved critical thinking and built capacity for appropriate judgment.

Case 5

Context & rationale

Implementing digital tools to motivate students for Graphic Design courses has been successfully applied at College of Technology II (HVCT) since 2020 (Hoa & Ngan, 2021). Peer assessment was also used for a Graphic Design on Computer class at HVCT with 25 students, for 3 specialized subjects that are Multimedia Technology, Interior Design and Web Design, in the 2nd and 3rd years. Before the study, the lecturer assessed the competency of the students by midterm practice test and final exam. Presentation on topics is also a common activity. They presented their topic quite well, but they paid little attention to the presentation of other groups. The form of Peer assessment both helps lecture assess students' ability and is a learning method that helps students practice more skills, including listening, observation, and commenting and evaluation skills.

Organization

There are two types of assignments that students must perform in each specialized subject: (1) Individual assignments: each student must complete a required product; (2) Group assignments: each group has three students, must give a presentation on a given topic. The lecture clearly explains the assessment method and assessment criteria. The final score of an individual or a group is calculated as the average of the teacher's scores and the scores of other students/groups. For individual assignments, the lecturer uses the Padlet tool to collect and display student work; Students will comment and rate their friends'

products below. For group assignments, depending on the topic, each group will give a presentation and other groups will ask questions and evaluate; or groups post their presentations on the Padlet for other groups to comment and evaluate. In the first two subjects, students were not brave enough to comment and evaluate each other, so they often gave good comments and gave high marks. In the following two subjects, students commented on each other more actively and in more ways, and discovered many interesting problems. Students also know based on the criteria to score more accurately.

Evaluation

With the peer assessment method, students must be active: must complete their own product/presentation, must observe, listen to other people's/group's work/presentation to give feedback, review and evaluate. As a result, students better understand information from each other's topics, find strengths and interests in their colleagues' presentations, pay more attention to errors in their colleagues' work, through which to draw experience for themselves. It can be said that peer assessment helps students improve their listening, observation, communication and critical thinking skills very well. More than 85% of students surveyed agree that applying peer review helps them learn more actively and improve many skills. However, in order for this method to be highly effective, lecturers must spend a lot of time designing assignment and assessment criteria in accordance with the subject's objectives. It is also very important to explain to students the meaning and how to comment and evaluate each other, contributing to creating good learning motivation for students.

3. Reflection and Discussion

3.1. Lesson learnt

The aforementioned successful cases have a number of common features:

1. *Clarify purposes and expectations of peer assessment:* At the beginning of peer assessment assignment, set up a clear perspective, that is, students shall see peer assessment mainly as a learning opportunity to get a better idea of their own learning process and performance. Concrete examples (e.g. previous year students give an anecdote) on peer assessment benefits, for instance, how assessing others' work can give insight into monitoring the quality of their own work (see all cases).
2. *Pay enough time and attention to drawing up the assessment rubric* (if possible, in consultation with students). Organize activities to help students fully understand Rubric. This can be done by using a demo: Analyze a few examples or cases with your students (for instance a paper or presentation from last year) to clarify the assessment Rubric (criteria and standards). If time allows, it is even better to let students try out and give feedback on these try-out activities (see all cases).
3. *Make the peer assessment anonymous* when students still feel not at ease to judge each other (see the case 2).
4. *Ensure multiple peer assessors* to reach a higher reliability and validity - ensure each student is assessed by at least two or three fellow students (see all cases).

3.2. Attention points for implementing peer assessment

Compared to traditional assessment, when implementing peer assessment, lecturers give students more responsibility and control. Many educational studies have suggested that the degree of control given to students shall match the learning goals and level of students' prior knowledge and their learning ability.

Peer assessment probably appears harder for students in the first year. This can be due to the fact that they do not know yet how to approach it in a most appropriate manner, i.e., to carry out peer assessment according to the academic culture in the discipline, and they often do not know how to direct their own learning process with peer assessment. Of course there are individual differences between students, but in general, when students have no or little experience in peer assessment or/and at the earlier stage of

their academic study will require more guidance than students who have sufficient experience in peer assessment or/and in later phases of their study. The more they gain experience or/and progress in their study programme, the less guidance they need, and they will be able to stimulate themselves, work independently, and direct their own learning process with the feedback from peer assessment.

According to (Vermunt & Verloop, 1999) (see table 5), learning to think independently can be seen as an evolution from strong guidance by lecturers to a more lenient way of guidance (see table columns ‘degree of lecturers’ control in students’ learning), which goes hand in hand with an evolution from basically low engagement and learning ability by students, to students being able to give constructive feedback to each other and using the peer support to monitor and adapt their learning entirely on their own to meet the given requirements (a successful case of peer-supported learning).

Table 5: Make an appropriate match between the degree of teaching’ control in students’ learning

Degree of students’ learning ability	Degree of teaching’ control in students’ learning		
	Strong	Shared	Loss
High	x (inappropriate, has negative consequence)	x	Appropriate
Intermediate	x	Appropriate	Less ideal
Low	Appropriate	Less ideal	x

(based on (Vermunt & Verloop, 1999))

In general, the peer assessment design for students who are low in learning ability may have some differences compared to the ones for high learners (i.e. knowledgeable and more skillful). For the former groups of students, lecturers need to give more and stronger guidance on how to implement peer assessment and how to make the best out of the peer feedback.

4. Conclusion

EMVITET project pays a lot of attention to support lecturers to create student-centered and competence-based learning environments towards education 4.0, assessment is perceived as an important way of learning. Some case studies showed the feasibility of peer assessment in theory, practice courses demonstrating the active role of students in their learning process.

Through the seminars of the EMVITET project on assessment in general and peer assessment in particular, one of the big changes is that the project members have better understanding and know how to implement peer assessment supporting learning experiences and course outcomes. The good news is that, based on the survey results as presented above, the learners have accepted and felt comfortable with peer assessments, and they wanted this kind of assessment to be widely implemented in many courses in the near future. The use of technology for implementing peer assessment contributed to students’ positive attitudes towards peer assessment.

Based on the literature and experience gained from the cases, there are some suggestions for effective implementation of peer assessment in Vietnam context:

- Compared to traditional assessment, when implementing peer assessment, lecturers give students more responsibility and control. It is suggested that the degree of control given to students shall match the learning goals and level of students’ prior knowledge and their learning ability.
- Guidelines and content of peer assessment have to meet the course outcomes,

- Digital tools are recommended to be utilized,
- The peer assessment can be best prepared by a group of lecturers teaching the same course,
- Effectiveness of the peer assessment was shown at the class size of maximum of 50 students. When the number of students exceeds 50, extra attention shall be put in ensuring the organization is clear for students.

Most importantly, to make assessment as learning, lecturers shall adopt the following two perspectives:

First, assessment is no longer seen as merely a tool/element that is separated from teaching and learning process but as a part of instruction and learning - *assessment needs to be integrated with all learning assignments/tasks* as they can help generate data and evidence for students and lecturers to proceed.

Secondly, taking “assessment as learning” perspective, (integrated) assessment is no longer solely educators’ (lecturers or tutors) responsibility. Rather, the ultimate goal is that by *engaging students in integrated meaningful assessment tasks and processing constructive feedback*, students learn the evaluation criteria and standards, be fully aware of the learning foci and final performance expectations and be able to deploy similar standards and criteria to perform valid peer-assessment or self-assessment. In other words, students need to learn how to monitor, collect and use internal and external feedback to suggest to their classmates or/and to make appropriate adoption of others/own learning for better learning outcomes.

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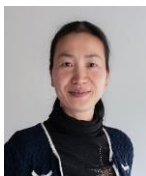
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