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Implementing Feedforward-based Collaborative Assessment in Higher Education

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The study examines the use of feedforward-based collaborative assessment (FbCA) for students majoring in foreign languages at a tertiary institution in Vietnam. A mixed-method research approach was utilized to collect both quantitative and qualitative data from 306 English major students and eight teachers. Research instruments such as questionnaires, reflective diaries, observations, and interviews were employed to assess the perceptions of students and instructors regarding the significance of implementing FbCA, its impact on students' learning engagement and academic achievement, and students' expectations for changes in assessment mechanisms to ensure the effective use of FbCA. The findings highlighted several benefits of FbCA in terms of skill, knowledge, and practice development. This evaluation approach enhanced students' learning motivation and positively contributed to their academic performance. However, the qualitative data also revealed various challenges related to the effective implementation of assessment practices and the maintenance of academic integrity. Based on these findings, recommendations were made for improving teaching, learning, and assessment practices.

Keywords: academic performance, collaborative assessment, feedforward assessment, foreign language-majored students, learning motivation

Introduction

Identifying that learning is a process, instructors have recently taken progress-based assessment into consideration to be employed in classroom instead of outcome-based assessment (Dawson et al., 2019; Winstone & Carless, 2020). However, effectively implementing this assessment approach has emerged as a pressing issue. Several noteworthy questions revolve around the topic such as "What assessment models are applied to align with the current learning and teaching approaches? How can teacher and students implement the assessment practice effectively? How students' academic outcomes change after utilizing this assessment method?". Educators, researchers, and instructors have shown concern for these inquiries, investing more efforts to explore optimal solutions to these issues. The term "feedforward" has recently become prominent in assessment landscape, existing and utilizing alongside "feedback". While feedback emphasizes reflection and looking back at what has been done, feedforward is recognized as a process of moving forward to improve the products and to obtain the goal (Winstone & Carless, 2020). Southall and Wason (2016), Thorpe (2008), and Tong (2011) acknowledge that feedforward provides opportunities to receive comments before summative assessments. Through feedforward, learners not only revise knowledge

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but also to improve skills such as planning ability, critical thinking capacity, or self-assessment practice competence. Students use the strategies to analyze, monitor, and subject their work to teacher requirement (Huang, 2016; Robson et al., 2015).

Collaborative assessment in classroom has been predominantly adopted in cooperative learning environment, in which a test or project is completed collaboratively by group members under the framework of group-based assessment, with the entire group receiving a shared grade. To fulfill the required assessment tasks, students collaborate, exchanging their knowledge, skills, and expertise. The advantage of this evaluation method is to facilitate the development of their domain-specific knowledge, skills, and collaboration. In a study by Meseke et al. (2009), chiropractic students who participated in a group evaluation stated that collaborative assessment boosted their confidence and improved their critical thinking. When students cooperate to debate and discuss the exam questions during group assessment, it serves as a learning experience (Klecker, 2002; Zipp, 2007). Additionally, with a collaborative assessment, examiners reduce the time needed for grading students (Ahern, 2007; Augar et al., 2016)

Especially, with the assistive technology tools in smart educational environment, assessment in the classroom has significantly improved. Teachers have more opportunities to access the innovative assessment approach.

Few previous studies have proposed a novel assessment approach that integrates feedforwards and collaboration to facilitate online learning and teaching. To formulate an appropriate assessment approach in an interactive online learning environment, the instructors design the feedforward-based collaborative assessment approach (FbCA). Using the mixed-research methods, including qualitative, quantitative, and quasi-experimental approaches is also an outstanding facet of this study.

The following research questions were highlighted to clarify the paper's objectives:

1. What is significance of implementing FbCA in foreign language classrooms from students' perspectives?
2. How does FbCA influence students' learning engagement in the course and academic achievement?
3. What are students' expectations about changes in the assessment procedure to facilitate the effective implementation of FbCA?

Literature Review

Feedforward and Implementation of Feedforward in Classroom

Researchers and educators have recently given feedback in higher education more substantial attention in terms of practice and research developments (Dawson et al. 2019; Nicol & Macfarlane-Dick 2006; Winstone et al. 2017). Winstone and Carless (2020) reconceptualize feedback as a product provided to students that comprises information about their performance in the form of teacher comments through the assessment. In contrast, from the perspectives of the socio-constructivist,

feedforward is identified as a process in which learners receive the comments on performance, make a critical reflection, and take actions to improve their academic products (Reimann et al., 2019). The term "feedforward" is generated from the process of reflection and the undertake of actions to improve the achievement. To elucidate the techniques in assessment, Hattie and Timperley (2007) demonstrate the related notions, such as feed up, feedback, and feed forward. The term "feedforward" is associated with one stage of feedback; however, feedforward is emphasized as a process of moving forward to improve the products and obtain the goal.

A distinct conceptualization of feedforward is provided by Sadler (2010), connecting the term "feedforward" to transmission and teacher-focused techniques, including pre-assessment guidance and future-oriented remarks. In a phased approach, Walker and Hobson (2014) examined an assessment criteria workshop followed by an exemplar grading task, both designed to contribute to the module's summative assignment. Feedforward is recognized as a reflective tool that empowers students to extend their thinking and performance beyond the objectives of modules (Crook et al., 2012; Calonge et al., 2013). Correspondingly, through feedforward, learners not only have opportunities to reflect on their knowledge, but also enhance various skills such as planning ability, critical thinking capacity, or self- assessment practice competence. Students employ the strategies to analyze, monitor, and align their work with the requirements set by teachers (Robson et al., 2015; Huang, 2016).

Engaging in active learning through feedforward provides students with the chance to envision and shape their upcoming activities. Based on constructivist ideas, teachers can influence how their students learn and promote active engagement (Artvinli, 2012). The feedforward interview is explored as a method to generate effective behaviors adaption in learning process (McDowall, Freemann, & Marshall 2014; Grlitz, Schmidmaier, & Kiessling 2015). This approach is portrayed as a means of guiding future performance by facilitating goal-setting and enhancing self-efficacy. In a separate study, the use of a feedforward self-modelling video is applied to enact desired performance (Ste-Marie et al., 2011; Robson, Blampied, & Walker 2015). In Huang's study (2016), foreign language students listened to audio recordings of their previous oral exams transcribed and meticulously analyzed their performance in accordance with standards. They surpassed their teachers' feedback by identifying areas of excellence and potential improvement. According to Huang (2016), feedforward play a pivotal role in feedback, enabling students to determine what they need to do to enhance their own performance.

Collaborative Learning and Implementation of CA in Classroom

Collaborative learning is recognized as a learning phenomenon where individuals within a group or team collaborate on the same or distinct aspects of a shared task to achieve the ultimate learning objectives, including knowledge and skills (Strijbos, 2016). According to Strijbos (2011), the design of collaborative learning must adhere to two fundamental principles: (1) individual accountability and positive interdependence, which are crucial in any collaborative learning environment; and (2) alignment of the eight core components for collaborative learning design identified by Strijbos et al., (2016). The Group Learning Activities Instructional

Design (GLAID) framework developed by Strijbos et al., (2016) serves to assist educators in creating collaborative learning environments that are more likely to produce the desired learning outcomes by explicitly requiring teachers to design the alignment between collaborative learning components. The framework comprises eight elements, including interaction, learning objectives and outcomes, assessment, task characteristics, structuring, guiding, group constellation, and facilities. The assessment component of GLAID appears to be understudied (Strijbos, 2011; 2016; Forsell, Forslund Frykedal, & Hammar Chiriac, 2020). This study provides a comprehensive insight into the implementation of feedforward-based collaborative assessment in cooperative learning process from the stakeholders' perspectives.

Collaborative assessment is conducted in classroom with the goal of achieving cognitive outputs (e.g., knowledge), social outcomes (e.g., communication and collaboration skills), and motivational outcomes (e.g., attitudes (Strijbos, 2011). Sharing educational materials and cutting down on the amount of time needed for instruction and grading students are the advantages of implementing collaborative learning (Ahern, 2007; Van Aalst, 2013; Augar et al., 2016). Cooperative assessment is employed in collaborative learning environment to enhance effectiveness in academic outcomes. Nevertheless, Chiriac (2020) argues that peer learning will not be fully realized if evaluations convey the message that only individual performance is recognized and that collaborative effort is equivalent to cheating.

Collaborative assessment existing, often employed in parallel with individual tests in the classroom, is predominantly utilized in cooperative learning settings. In this approach, a test or project is collectively completed by group members within the context of group-based assessment, resulting in a shared grade for the entire group. In order to fulfill the assessment requirements, students engage in collaborative efforts, sharing their knowledge, skills, and expertise. The advantage of this evaluation method is to facilitate pupils develop their domain-specific knowledge and skills, and also impart valuable lessons in cooperation. According to a study by Meseke et al., (2009), chiropractic students involved in group evaluation reported increased confidence and improved critical thinking. When students cooperate to discuss the exam questions during group assessment, it serves as a valuable learning experience (Klecker, 2002, Zipp, 2007). Additionally, collaborative assessment has the benefit of reducing grading time for examiners (Ahern, 2007; Whitefield & Winchester, 2016).

However, several challenges hinder the successful implementation of collaborative assessment. The primary issue lies in the devaluation of individual success within a group-based evaluation framework. The fundamental drawback of group assessment is its occasional inability to accurately gauge individual achievement. Many examiners are skeptical about the accuracy of the shared score in a group in comparison with the score leaners would have achieved if they had taken the test separately. Ewald (2005) acknowledges that the shared outcome of a group-based performance is not an accurate or reliable predictor for the individuals' evaluation. In an experimental study by Nafziger and Meseke (2010) with group quizzes conducted in a neuroanatomy course, the authors discovered no significant difference in the grades of the final examination between the two control and experimental groups although students doing the questions jointly achieve the better results than the control group

in the progress tests. This adds further evidence to the argument that group assessments often fall short in measuring individual achievement.

While existing studies shed light on collaborative and feedforward-based assessments and their impacts on academic performance, there has been limited integration between collaboration and feedforward assessment. This study aims to bridge this gap by exploring the implementation of feedforward-based collaborative assessment for foreign language major students in higher education.

Methodology

Research Design

The mixed-method research incorporating quantitative, qualitative, and quasi-experimental approaches was undertaken to ensure a general view of the issue and specific insights (Howard, 2019). Questionnaires were handed out to collect the quantitative data. The answers from the in-depth questions and interviews provided the detailed information for the qualitative data. The techniques for interview are not only the direct inquiries in which students reveal what they themselves thought and did, but also the exprience-based questions (Hard et al., 2016). To ensure the reliability of the students' revelation, the interviews were conducted after the course when the assessment completed and the results were announced. The ethical problems were addressed with a participation agreement sheet covering participant's consent to involvement in the survey. The author asserted that all the information is kept confidential with the hidden names or codes. The Paired -Sample test will be conducted to examine student academic performance in the control and experimental groups. The Paired-Samples t-test is a statistical method used to determine whether there is a significant difference between the means of two related groups.

Participants

The study included 306 first and second-year students from the English department at a university in Hanoi. These students were enrolled in the general English course during the academic year 2021-2022, along with eight teachers from the English department. Of the students, 29.1% were male, and the rest were female, with ages ranging from 20 to 22 years. Following agreement with other teachers, the students were divided into two groups: control and experimental groups, representing FbCA-based classes and traditional assessment-based classes. The data supporting the study's findings are available upon request from the corresponding author, but they are not publicly accessible due to privacy and ethical considerations.

Instruments

Questionnaire

On the basis of the research questions, literature review about feedforward-based assessment and collaborative assessment, the author generated the questionnaire to collect the quantitative data. The questionnaire was designed consists of 29 items. In this study, the main content of the questionnaire survey covers four sections following: Background information (8 questions); Students' evaluation towards the significance of FbCA (15 questions), the influence of FbCA on student learning engagement in the course (2 questions), the influence of FbCA on students' academic achievement in the course (4 items). The options of each answer were formulated based on the 5 – Likert scale with 5 levels: Strong Agree – Agree – Neutral – Disagree – Strongly Disagree.

In-depth questions: To provide more information and details for the answers in the questionnaire the in-depth questions were exposed to participants.

(1) How beneficial is the FbCA online assessment implementation in your course? Explain and provide more evidence.
(2) How does your learning engagement and academic achievement change when applying FbCA? Clarify your ideas.

Observations and Reflection

The author observed and took students' learning attitude, contribution, engagement, and feeling in the classroom into consideration, and noted in the reflection diary to obtain the data for the second study question connected to learning engagement in the classroom.

Interview

For the third research question related to students' expectations about changes in assessment mechanism to ensure employing FbCA effectively, data was collected through interviews with both students and instructors. The researcher required students to clarify the following queries to address the research question:

(1) What challenges are encountered in implementing FbCA, and how can they be addressed for improvement?
(2) What are students' expectations about changes in assessment mechanism to ensure the effective implementation of FbCA?
(3) What measures should teachers and students take to ensure academic integrity in FbCA?

Tests

Tests consist of pretest and post-test. Pretest is provided to student to check the initial knowledge before the intervention of FbCA in control and experimental groups. Post-test is the final test conducted at the end of the course in order to check students' academic achievement.

Data Collection

Data for the study were gathered using a mixed-methods approach integrating qualitative and qualitative approaches. Two ways of data collection were used by the researcher: giving out questionnaires to participants in-person in the classroom, or using other tools. The researcher then tallied the number of respondents who selected each option and displayed the results as a percentage. Direct communication (face-to-face) or indirect communication were the two methods of interviewing the subjects (via social networks or mobile phones). Direct talks were noted, and then transcribed.

Data Analysis

To realize the aims of the study, quantitative and qualitative research methods have been used. The quantitative data were analyzed through descriptive statistics IBM SPSS 25.0 software. The demographic information of the participants was analyzed, based on the frequency descriptive test. Exploratory factor analysis (EFA) was implemented to explore a satisfactory reliability of dependent variables.

The data about students' evaluation towards learning objectives and challenges through FbCA implementation will be treated through descriptive test. Independent-samples T-test will be used to compare the difference between students' learning engagement in classes with the implementation of FbCA and without any intervention. The Paired -Sample test will be conducted to examine student academic performance.

The coding technique "Auto-Coding" was used to treat the qualitative data. Auto Coding finds text passages, selects a specified amount of text, and then codes the passage with a previously selected code. The information collected from the in-depth questions, interviews, and reflection notes was sorted based on the repetition of key words in context; comparison and contrast, metaphors, and analogies must be gathered into codes and common themes (Gibbs, 2010; Bernard & Ryan, 2010).

Description of FbCA

Feedforward-based collaborative assessment was implemented in a general English course at foreign languages department at a university in Vietnam with the assistance of Skype, Zoom, Google docs and other technological tools. This application transpired during the first semester of 2021-2022 academic year. The course spanned 15 weeks encompassing both theoretical and practical sessions, featuring two principal assessments: a progress test and a final test. The progress test, constituting an integrated assignment, was evaluated through FbCA approach.

This test involved a combination of reflection diary and oral presentation, structured across three stages: initial manuscript submission, paper revision based on the teachers-peers' feedforward, presenting the final outcome and submitting the reflection diary. The instructor introduced the topic at the beginning of the course and organized the class into groups of 3-4 students. This group size is appropriate for the task distribution among members. Besides, the teachers and leaders could observe and manage the activities easily. Leaders of each group randomly selected topics related to the lecture content. The teacher provided relevant documents and materials to each group to gather information and knowledge. Collaboratively, group members discussed, allocated tasks, and carried out their responsibilities. In the third week, all groups submitted initial versions including the topic outline, introduction about the group, detailing work distribution, and the group's plan. Upon receiving submissions, the teacher reviewed and offered feedback, serving as a feedforward for students to revise and align their work with the lecture content and course requirements. Utilizing feedback from both teachers and peers, group members engaged in discussions and took steps to fulfill the assignment. The adaptation process, individual contributions, and plans for editing the task were documented in a reflection diary for each group, which was attached to the final presentation. The teacher used the presentation and reflection diary to evaluate the final product of the groups.

Results and Discussion

English-majoring Students' Evaluations of the Significance of FbCA

The results from Table 2 illustrate the beneficial significance that FbCA brought about in terms of skills development, critical reflection, collaboration, and learning motivation. Particularly, the first ranks lie in the benefits like promoting students' group-working skills (M=3.98, SD=0.932), developing students' problem-solving skills (M=3.94, SD=0.912), upsurging student learning motivation (M=3.80, SD=.925 and empowering active learning (M=3.80, SD=0.854). These items received the positive evaluation from many students who realized that FbCA developed their group-working skills since they collaborate and together think the ways to address the issues. A high number of participants highly appreciated the role of FbCA in transmitting the shared knowledge, inspiring collaboration and cooperation, increasing self-evaluation and peer assessment, enhancing interaction among students with the values M=3.73; 3.55; 3.52; 3.76 respectively, and the values of Std. Deviation are higher than 0.70. This figure dedicates that there is a great disparity in the options the participants chose.

Successively, the significance of FbCA is illustrated in reinforcing students' communication skills; boosting critical thinking skills; improving students' learning outcomes; improving planning skills and giving decision with the values of means at 3.46; 3.42; 3.39, and 3.39 correspondingly. The items with the lowest agreement are enhancing students' critical reflection, rising students' creativity, and reinforcing students' confidence.

Table 1. Students' Evaluations towards Benefits of FbCA

	Minimum	Maximum	Mean	Std. Deviation
Enhancing students' critical reflection	1	5	3.08	.903
Reinforcing students' communication skills	1	5	3.46	1.026
Promoting students' group-working skills	1	5	3.98	.932
Boosting critical thinking skills	1	5	3.42	.863
Transmitting the shared knowledge	1	5	3.73	.754
Developing students' problem-solving skills	2	5	3.94	.912
Improving students' learning outcomes	1	5	3.39	1.125
Rising students' creativity	1	5	2.97	.983
Inspiring collaboration and cooperation	2	5	3.55	.752
Improving planning skills and giving decision	2	5	3.39	.867
Increasing self-evaluation and peer assessment	1	5	3.52	1.020
Upsurging student learning motivation	2	5	3.80	.925
Enhancing interaction among students	2	5	3.76	.992
Reinforcing students' confidence	1	5	2.90	.923
Empowering active learning	2	5	3.80	.854

In addition, in the in-depth questions, participants acknowledged that they highly approved FbCA because in addition to getting more shared knowledge with less time spending on reading materials they have more chances to reinforce their skills and ability that they could not receive when performing the tasks individually. Also, students admitted that involvement in the FbCA activities made them more active in learning. This is really a dynamic learning environment that constantly stimulated them to take academic actions in order to obtain the ultimate goals of their group. In the interviews with the questions relevant to the significance of the FbCA on student learning motivation, students revealed that FbCA practice are beneficial and inspire them to learn constantly. FbCA prompts them to be more active and autonomous to obtain the ultimate academic objectives. Cooperation makes the assessment process more convenient and more effective, so they have more motivation to engage in learning. They can create our own learning path to identify what they should do next, what should not, what should be changed, and how do they meet the requirement from teachers. This practice made them go beyond emphasizing on the current mistakes. *"We have to focus on how to solve the problems, and adapt in a collaborative learning environment. We can evaluate the others and self-evaluate our academic performance*." (L.B., female).

The qualitative data demonstrate that students' willingness to engage in the activity to discover the most suitable solution to challenges was significantly improved. Student H.N acknowledged *"Before, I was so afraid of being involved in problem-solving tasks in classroom, especially, in real situations, because we cannot make any response promptly or I was too embarrassed and nervous to think the language and ideas immediately."* After embarking into the FbCA, students feel more confident because they had more chances to interact with the others. The discussion and communication are meaningful and interesting. This helps students revise the old knowledge, look at their performance to self-evaluate themselves and make the vital changes.

Student L.A. said "*Problem-solving skills are crucial for learners. Now we enhance our skills through the activities*". Student perspectives about the assessment are various, but all emphasize one significant influence of FbCA that makes students more confident to participate in the social and community activities. N.T. (23 years) told that before there had been many web pages of academic or voluntary activities in communities or institutions on social network. However, we did not dare to enroll in them because the lack of knowledge and confidence. After experiencing the FbCA, we gained the strategies and skills to react in public activities, so we felt less nervous. H.K said that practice makes perfect is a true in this case.

The Influence of FbCA on Learning Motivation and Academic Achievement

Students' Evaluations towards Learning Motivation in FbCA-based Classes Compared to Traditional Assessment-based Classes

Table 2. Learning Motivation in FbCA-based Classes and Traditional Assessment-based Classes

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
V1	Equal variances assumed	12.983	.000	-2.596	304	.010	-.183	.070	-.322	-.044
	Equal variances not assumed			-2,596	291,413	.010	-.183	.070	-.322	-.044

As it can be referred from Table 2, The Sig value of Levene's Test is lower than the preset (0.000< 0.05). As a result, the independent t-test is analyzed, based on the value of Equal variances assumed. Obviously, that the value of Sig. (2-tailed) is at 0.01 less than the significance level $\alpha = 0.05$. This result came to conclusion that there is a difference between learning motivation in FbCA-based classes and traditional assessment-based classes. The difference is *slight with the value of* Mean Difference at -0.183.

The in-depth questions revealed students' opinions about their learning motivation in FbCA-based classes. They unfolded that they had to opt the learning approaches to adapt to the particular assessment method that teachers informed from the beginning of the course. FbCA requires students' collaboration and problem- solving ability to address the issues or feedback teachers found in their tests, and to accomplish the tasks. The duties of students in FbCA must go beyond recognizing the mistakes in comments by teachers. They had to make reflection, planned specific steps to review,

edit, and complete the final academic product "*We feel that our responsibilities are twofold. With respect to feedforward, we not only have to look back to the feedback, but also have to look forward to the next procedure to improve the assignment*." In terms of collaborative assessment, there need to be the effort by teams, the attempt of each individual, but also, are of importance. Consequently, students found their responsibility in autonomous learning and cooperative performance should be urged, or their engagement into academic activities must be enforced "*We think that our learning motivation has increased since the assignment volume was more enormous and team-working liability was more highly required. We must constantly keep moving forward, we did not have rights to stop or delay carrying out the tasks*". Additionally, thanks to collaboration and sharing work, students could lessen the difficulty and obstacles. If students did not feel disappointed and stressed with the work, they had more interest and motivation in work.

The data from the observations in the classroom and reflective diary after the course indicate that the number of students were engaged in contribution to the lessons and raised their voice to answer questions in FbCA-based classes is significantly higher than in the traditional assessment-based classes. The number of students who accomplished their reflective diaries and tasks in response to each teachers' requirement, which were intended to grade students' performance and contributions, was different from the conventional one. In the reflective diary, students take notes of the steps and procedure for editing the assignments based on the teachers' feedback, in which the tasks of each person will be detailed. The diary as a portfolio provided teacher the information on how the student addressed the comments, how they assigned their tasks to each member, and how they planned the steps to accomplish their product. The teacher followed and kept track with the performance of each group, so the students were motivated to perform their tasks properly.

The Effect of FbCA on Student's Academic Achievement

Paired -Sample test was utilized to examine the difference between the effect of FbCA on student's academic achievement in the control and experimental groups. A hypothesis was proposed: there is no difference between academic achievement between the experimental group involved in FbCA activities and the control group without the intervention.

Table 3. The Effect FbCA on Student's Academic Achievement in the Control and Experimental Groups

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Dv	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pretest Scores of control and experimental groups	.007	1.016	.082	-.156	.169	.080	152	.937
Post-test Scores of control groups	-.386	1.225	.099	-.581	-.190	-3.892	152	.000
Post-test Scores of experimental groups	-.451	1.390	.112	-.673	-.229	-4.012	152	.000
Post-test Scores of control and experimental groups	-.843	1.401	.113	-1.067	-.619	-7.445	152	.000

As can be seen from Table 3, the Pretest Scores of control and experimental groups are not different with the value of Sig. (2-tailed) at 0.937. This illustrated that students from 2 groups took the place- tests with the similar scores. These results indicated valuable input conditions for carrying out the FbCA intervention experiment. The Sig. value of 0.000 lower than 0.05 in the Post-test Scores of the control and experimental groups shows a little difference in the scores of the experimental group and control group. The hypothesis that the group utilizing FbCA and the group not using FbCA in learning achieve the same academic levels of success is, therefore, rejected. Higher average scores (Mean=7.15) in comparison to the group not receiving support from the FbCA (M=6.7) clearly show that students from experimental groups made academic improvement with the intervention of FbCA.

Changes in Assessment Mechanism to Ensure Employing FbCA Effectively

In order to ensure the reliability and adaptability of feedforward-based assessment (FbCA) in a collaborative learning environment, it is essential to address certain issues within the assessment process. There are various perspectives on the changes in the assessment mechanism to effectively implement Feedforward Collaborative Assessment (FbCA). To achieve this in higher education, it is essential to transition from conventional summative assessment methods to more formative, process-oriented practices. Feedforward emphasizes providing guidance aimed at enhancing students' future performance rather than merely assessing their past work. Teachers should prioritize future tasks, delivering specific recommendations on how students can improve their performance. Explicit insights and suggestions should be provided to direct students' focus toward their upcoming assignments.

Reflection is essential; therefore, fostering discussions between students and instructors to clarify expectations and identify areas for improvement should be encouraged. Teachers must ensure a collaborative learning environment by involving students in assessing each other's work and providing constructive suggestions for

future assignments. Utilizing collaborative formats such as workshops or seminars allows students and faculty to collectively discuss feedback and future strategies. Shared responsibility should also be encouraged, fostering a sense of joint ownership of the learning process among students and educators while emphasizing common objectives.

A continuous assessment process should be implemented with iterative assignments, including creative tasks that build upon one another. This approach enables students to apply feedforward in subsequent tasks, allowing them to submit drafts, receive feedforward, and make revisions before the final submission. Progressive assessment over time allows students to incorporate improvements based on prior feedforward.

With technological advancements, the use of advanced assessment tools such as e-portfolios, Learning Management Systems (LMS), and interactive platforms should be frequently integrated into classrooms. E-portfolios enable students to chronicle their educational experiences, integrating feedforward to illustrate their development. LMS can support continuous feedforward, facilitating feedback for both individuals and groups. Collaborative platforms, utilizing discussion boards, shared documents, or video conferencing, can generate group-oriented feedforward initiatives.

Building a feedforward-driven teaching and learning environment in the classroom should be prioritized. It is important to advocate for the understanding that feedforward facilitates ongoing improvement. Additionally, creating classrooms where students feel comfortable sharing and receiving feedback is imperative. Teachers should acknowledge and appreciate students' critical thinking and assessment efforts.

Discussion and Recommendations

Pertaining to students' evaluation toward the benefits of FbCA, FbCA is beneficial in enhancing students' critical reflection, reinforcing students' communication skills, promoting students' group-working skills, boosting critical thinking skills, transmitting the shared knowledge, developing students' problem-solving skills, improving students' learning outcomes, Inspiring collaboration and cooperation, improving planning skills and giving decision, increasing self-evaluation and peer assessment, upsurging student learning motivation, enhancing interaction among students, and empowering active learning. These findings are consistent with the study by Calonge et al. (2013) and Huang (2016). The way teacher applied FbCA to assess students' performance influences the way students learn and perform. By prioritizing feedforward, students gain insights on how to improve their future performance, fostering a growth mindset and promoting ongoing learning. When students identify areas for improvement, they engage more thoroughly with their educational journey, cultivating self-regulation and a sense of ownership over their learning.

On the basis of correlation between FbCA and learning engagement levels, the data reveal that FbCA has a positive influence on learning engagement. Participation in peer assessments and group discussions increases student engagement, as they

actively contribute to and gain from shared learning experiences. A focus on constructive feedback creates a supportive atmosphere, alleviating the anxiety often linked to traditional assessments and boosting motivation. Particularly, students took more time to engage in the learning activities in FbCA-based classrooms than in the traditional ones. These findings coincide with the investigations by Zipp (2007), and Calonge et al., (2013) that manifested that CA is much more than individual or peer assessment in terms of motivation.

Pertaining to the correlation between FbCA and academic achievement, the study reveals that using FbCA has positive influence on academic achievement. Regular feedback enables students to make gradual enhancements, resulting in improved academic performance over time. Students not only refine specific tasks but also cultivate transferable skills such as critical thinking, collaboration, and problem-solving. This results are in accordance with the studies Calonge et al., (2013), Hammar Chiriac (2020), and are in contrast with the investigation by Ewald (2005) and Meseke (2010) who found that CA is not a reliable predictor of academic achievement for individuals, even, is a cheating tool in learning. Apparently, FbCA with a the feedforwards-based activities that are performed with collaboration of the group members, brings about many benefits. However, to optimize the effect of the assessment approach, there need to be strict disciplines, honest, and responsibility amongst group members. If not, FbCA causes negative impacts, for instance, cheating, argument or irresponsibility. In this study, teacher conducted the assessment project performed by student under the control of teacher, and there is always the timely reflection from students and the supervising from teacher, so, students had the good academic performance.

To implement FbCA effectively in higher education environment, the comprehensive solutions should be recommended to facilitate the stakeholders, including teachers' attempt to illuminate the duties, assessment, and criteria that students had to base on to accomplish the project. The teacher also has to adapt FbCA to the current teaching-learning approaches and syllabus, understand students' difficulties they face and their expectation to facilitate them to align with the new assessment method. Additionally, students should make more effort to collaborate with the partners in the FbCA activities, frequently reflect the performance to adjust it properly and design it more impressive. University managers and administrators will formulate appropriate management and education policies, creating a well-designed activities in assessment process to ensure academic quality and integrity.

Conclusion

The paper concludes that the benefits of FbCA are acknowledged in terms of in enhancing students' critical reflection, reinforcing students' communication skills, promoting students' group-working skills, boosting critical thinking skills, transmitting the shared knowledge, developing students' problem-solving skills, improving students' learning outcomes, Inspiring collaboration and cooperation, improving planning skills and giving decision, increasing self-evaluation and peer

assessment, upsurging student learning motivation, enhancing interaction among students, and empowering active learning. FbCA has a positive influence on learning motivation. This result is illustrated through the increased learning engagement levels in students' learning. Particularly, students took more time to engage in the learning activities in FbCA-based classrooms than in the traditional ones. The study also investigates that using FbCA has positive influence on academic achievement. Additionally, several changes in the assessment mechanism to effectively implement feedforward collaborative assessment are provided such as ensuring transition from conventional summative assessment methods to more formative one, process-oriented practices, intensive reflection, collaborative learning environment, continuous assessment cycle, the use of advanced assessment tools, building a feedforward-driven teaching and learning environment.

This research presents several limitations that could pave the way for additional exploration. Future investigations should prioritize the comparison of diverse assessment techniques and their effects on student learning outcomes, engagement, and overall performance.

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