

# Sustainable Education in Higher Education: A Systematic Review on Reflective and Cooperative Learning

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## Abstract

Learners have multiple learning styles and educators guide the learners to find the suitable learning strategies according to their proficiency level. Reflective and cooperative learning are interrelated pedagogies as both incorporate active learning for sustainable development to achieve learning goals in Higher Education (HE). In this article, a systematic review of literature about sustainable education in HE is conducted to address reflective and cooperative learning. The focus of this systematic review is towards reflective and cooperative learning in HE. A systematic review is Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA). A total of 26 articles related found in two databases, Scopus and Web of Science (WoS) after being screened and later, exclusion and inclusion criteria were applied to the selected articles for this systematic review article. The results revealed that reflective and cooperative learning has inter-disciplinary connections because both approaches always being integrated together which fosters transformative learning that can improve the effectiveness of the input given by the HE educators. Future research can be

conducted about both strategies in English Language as there are limited research done about integration of both learning strategies.

**Keywords:** Reflective Learning, Cooperative Learning, Higher Education, Sustainable Education, English Language.

### **Introduction**

Reflective and cooperative learning are two learning strategies which are commonly used in higher education. They are complementary strategies as both are always being integrated together in the Higher Education setting. Higher Education (HE) plays a role in preparing graduates to become sustainability leaders, with educational pro-programmes based on Education for Sustainable Development (ESD) values (Godber & Atkins, 2021). Critical thinking, strategic action, collaboration, interpersonal interactions, personal participation, and uncertainty tolerance are all goals of ESD (Acree, 2019). These two learning strategies are widely used and very important to apply in higher education.

Learning strategies like cooperative and reflective learning can help students develop and use their competencies with an emphasis on sustainability. Reflection on beliefs, actions, and objectives, for instance, serves as a foundation for critical thought and analysis. (Howell, 2021; Colomer et al., 2020). In Malaysian higher education level, the classroom are increasingly diverse, therefore higher education practitioners should develop a responsive learning environment to cater different learners to reach an optimal potential (Awang-Hashim et al., 2019). Therefore, reflective and cooperative learning is needed to produce students who are competent for today's world. However, not all undergraduates thought that implementing these strategies are effective to scaffold their learning (Murugaiah et al., 2010). To them, it can be time consuming to be in depth with others. They are more preferred towards individual assignments and find it difficult to reflect on their own learning [Bowers et al., 2021; Gkonou & Miller, 2021; Godber & Atkins, 2021; Acob et al., 2022].

English Language is a subject which is taught until tertiary education. (Hashim & Yunus, 2018). As the second language in our country, being competent in the language is compulsory and evident. A clear example is the implementation of Dual Language Programme (DLP) which emphasises on the use of English. (Yunus & Sukri., 2017). Therefore, English is the medium of instruction to ensure the dissemination of Mathematics and Science in English went well. A study done about which learning strategies suited the gifted students from PERMATA Pintar Education Programme in Universiti Kebangsaan Malaysia (UKM). It was mentioned that these pupils excelled in Mathematics and Science. Therefore, they emphasized a lot of student-centered learning, cooperative learning such as group laboratory, field studies, problem-based learning and many more. (Yunus et al., 2013)

There was a study on pronunciation ability to communicate in English Language. (Yunus et al., 2016). It is proven that to learn a language, one must possess the ability to pronounce well for effective communication to take place. Reflective and cooperative learning settings through mobile technologies such as group discussions through WhatsApp, sharing documents are all part of reflective and cooperative learning. (Hashim et al., 2016). Tools such as Computer Assisted Language Learning (CALL) can be implemented as part of cooperative learning for example to learn vocabulary. (Yunus et al., 2016). There are also pupils preferred to learn through online quiz such as Quizziz because they favoured that type of learning style. (Huei et al., 2021). Environmental support factors such as peers and teachers can have an impact on their attitudes and motivation to learn. (Yunus & Abdullah, 2011). Teachers can

shape learner's autonomy through cooperation and the learning process will bring the learners to reflect, analyse and see what is there to improve. (Yunus & Arshad, 2015).

Both learning strategies undeniably implement interdisciplinary approaches in many fields such as education, sports, business, psychology, dance, and nursing in higher institutions (Buckingham et al., 2021; Danaher et al., 2021; Fernandez-Diaz et al., 2019; Petsilas et al., 2019; Quew-Jones, 2022; Acree, 2019). A recent survey by SOS (2021) found that majority university students wanted to know more about how reflective and collaborative practices can contribute towards sustainable education and can be integrated across all courses (Howell, 2021). This systematic review paper will provide an overview on what and how reflective and cooperative learning is employed for sustainable education in higher education level across all contexts. This paper aims to answer the following research questions:

### **Research Questions**

1. What is the importance of reflective learning and cooperative learning for sustainability in higher education?
2. What is the relationship between reflective and cooperative learning to sustain higher level education?
3. What is the effectiveness of reflective learning and cooperative learning to sustain education in a higher level?

### **Theoretical Background**

#### *Social Interdependence Theory (SIT) by Johnson & Johnson*

Social Interdependence Theory (SIT) introduced by Johnson & Johnson (1989) describes that actions of the group members can affect the outcomes of the group. It can facilitate (positive interdependence) or hinder the attainment of the goals (negative interdependence) (Yaacob et al., 2021). Every student needs to contribute ideas and views and be responsible towards the tasks given to them [Sassenberg & Vlieg, 2019; Naziz, 2019]. Kurt Lewin, one of his colleagues, refined Koffka's notions in the 1920s and 1930s and here's the statements: (1) Interdependence among group members (common goals shared by all) is the basis of the group; as a result, it becomes a "dynamic whole" (2) An inherent state of tension among group members motivates members to work towards the desired common goals (Yusuf et al., 2019; Tindale et al., 2002; Steel et al., 2019).

It can be distinguished from social independence (i.e., people's results are unaffected by each other's activities) and social dependence (i.e., one person's outcomes are affected by another person's actions but not the other way around). Cooperative and competitive social interdependence are different from each other. The absence of social connections and reliance will result in individual attempts (Howlett, 2020). When goal, task, resource, and role interdependence is well understood, people acknowledged that their efforts are essential for the group to succeed (i.e., there can be no "free-riders") and that their contributions are frequently unique. In addition, reward dependency must be designed in a way that precludes one member's efforts from outweighing those of other members (Olsson et al., 2021).

There are six important elements emerged from Cooperative Learning (CL); positive interdependence, face to face verbal interaction, individual accountability, social skills, group processing and appropriate grouping. These are the six principles of Social Interdependence Theory (SIT). Positive interdependence has a close relationship with the Social Interdependence Theory (SIT), according to which interdependence can occur both

independently and collaboratively (Johnson & Johnson, 1989). Mentoring is also one of the themes when feedback is given to further reflect or practice.

There are some past studies that revealed the incorporation of social inter-dependence theory, specifically positive interdependence. An example of local study talks about example of activity incorporating the theory. The study showed that Think Pair Share strategy through actions, observation and reflection helps the researcher to gain information on how to use it (Singh et al., 2020). Massive Open Online Courses (MOOCs), a platform to equip students with collaborative skills but also take charge of their own learning, self-discovery skills, evaluate and interact with one another (Smith, 2003).

### *Dewey Theory of Reflective Practice*

Dewey (1933) introduced the concept of reflective thinking (Houde, 2022). The relationship between reflection and practice is referred to as reflective practice. He suggested that both practice of teaching and learning are incorporated into practice to produce a learning environment through practical experience (Hebert, 2015). Dewey proposed four criteria as follows (Miettinen, 2000; Roche, 2022; Rodgers, 2002):

1. Reflection is a process to create meaning that advances one's experience to the next with deep understanding of its relationships and how it is connected to other experiences and ideas. It enables learning continuity and assures the individual and, ultimately, societal advancement. It serves fundamental moral purposes.
2. Reflection is a methodical, rigorous, and disciplined mode of thought with origins in scientific investigation.
3. Reflection must occur in the community, through interaction with others.
4. Reflection needs attitudes that value the intellectual and personal development of oneself and others.

Based on the following criteria, it can be agreed that it benefits the institution if reflective practice is practiced properly. There can be situational factors which could affect time constraints and motivation (Draissi et al., 2021) Therefore, an institute in the US published the Guide for Reflective Practice based on Dewey's guide for reflective practice mentioned that faculty need to have specific instructions to ensure the engagement of reflective practice and document their reflections (Greenberg et al., 2021).

### *Schon's Reflective Practice*

Schon (1983) expanded on Dewey's (1933) work when he wrote about reflective practice in the fields of education and other professions. According to Schon, reflective practice is a way to bridge the gap through exposure of real theory behind what professionals do, which is opposed to what they said they do. In this regard, reflective practice essentially serves as a method of increasing performance (Mauri et al., 2019; Fook, 2015). To emphasize that it is necessary for environment to provide tools, organizational procedures, and technologies to expressly drive students to develop reflexivity, Schön proposed the idea of the reflective practicum. In the past, he had put forth the metaphor of the "reflective practitioner" to upend professional frameworks created by the technical rationality paradigm, which had previously demonstrated its susceptibility when confronted with the complexity, ambiguities, and difficulties of modern societal demands (Schon, 1983; Allison & Ramirez, 2020).

'Reflection-in-action' and 'Reflection-on-Action' are terms that are intimately associated with Schon's work. Schon said that a certain experience is connected to reflection-in-action. Transferring experience allows implicit or tacit knowledge to be reflected and used in activity. Future experiences gained from new ones are taken into consideration. On the other side, reflection on action takes place at the beginning of the meaning-making process following the experience. It might happen during introspective observation, when the focus shifts from confirming experience to identifying issues or queries raised by the experience. Here, concepts and hypotheses were also deduced and used in an abstract conceptualization process (Schon, 1987; Resch et al., 2022; Ruge & Mackintosh, 2020; Shapiro, 2010).

Reflective practice has been widely incorporated into the field of experience-based learning in higher education, including practicums, work-integrated learning, internships, service learning, and community involvement. According to the first study conducted by (Bubnys & Zydziunaite, 2010) collaborative reflective learning across contexts aided in the development of critical reflecting abilities and gave students a chance to question their own presumptions about moral and ethical teaching methods. An experimental study conducted in a Vietnamese university to test the hypothesis that students that implement cooperative learning method will achieve higher motivation than those in lecture-based method.

Reflective journal writing (RJW) also helps to gain insight how to become reflective practitioners. They are more comfortable to write as way to communicate and it went well (Kruger & Buley, 2022). The experimental group will be more motivated to learn if they work together frequently on learning assignments and are more engaged (Zafeer et al., 2023). Engaging with daily personal reflection to achieve sustainable development. For example, understanding about the project as tool for reflection, reflect with peers, role of instructor to guide re-reflection. They get in-depth and meaningful learning that develops professional development, values and attitudes (Tran, 2019; Diaz-Iso et al., 2019). The university can propose an initiative (example: work-integrated learning, reflective writing, etc.) and included in the curriculum. However, due to considerable amount of recontextualization and potential contestation over the control of the rules of pedagogic may happened, implementation is not an issue. How it is implemented, form part of the pedagogic discourse for this field are what counts as successful pedagogical practice (Uday Younis et al., 2021).

### *Education in higher level*

#### *Reflective learning in higher education*

Reflective learning in higher education places a strong emphasis on reflective thinking to help students make sense of their experiences and create their own meanings. Although the learning process is contextualised, Boud, Cohen, and Walker (1993); Brockbank and McGill (1998); Osterman and Kottkamp (1993), as cited in Ryan & Ryan (2011) claimed that self and subjectivity of the construction of knowledge are important in reflective learning. They also noted that reflective learning attributes an important role to the individual nature of the learning process, which includes emotions and feelings. It sees education as an all-encompassing process with cognitive, emotive, and interdependent components. Reflective activities must run concurrently with the program/course and should be aware of the reflective practice that the students were first exposed to, as well as its growth and ability to make connections across program/course years This enables students to build higher order abilities, reflective exercises should consider students' degrees of professional knowledge and prior experiences with reflection (Fullana & Pallisera, 2016).

Reflective practice is a core attribute to reflective learning (Barnett, 1992a). Schon's theory has been underpinned that all students can participate in reflective practice. All students from whatever discipline can engage in reflective practice can potentially achieve reflective learning (Brockbank & McGill, 1998). There is also a model for reflective learning and assessment for higher education known as Teaching and Assessing Reflective Learning (TARL). This model is associated with reflection to make effective pedagogic choices or task requiring multi-dimensional characterisation (Ryan & Ryan, 2015). An example of employment of reflective learning in experiential learning which engage in "learning through experiences" and it has positive outcomes on learning (Harvey et al., 2016). Autonomous learning also part of reflective learning as pupils learned to be responsible for their own learning. Pupils are taught to reflect and becoming self-aware of their education to achieve their learning goals (Yunus & Arshad, 2015).

A popular method is using reflective journaling as seen in Alt & Raichel (2020), which assess the effectiveness of using reflective journaling and it gives insights about their metacognitive awareness such as students perceptions as self-regulated learners. Another example of reflective journal writing can be seen in college whereby the results showed that students' reflective thinking level increased (Bruno & Dell'Aversana, 2018). Besides that, reflective practicum for student teachers also an example since the outcomes are valuable for sustaining students to become reflective practitioner (Xie et al., 2008). Blogs also used for reflective learning in higher education because feedbacks are provided by the lecturers, quality and quantity of students' work increases, dialogues between students and lecturers also increased (Ali & Byard, 2013). Blogs not only promotes the students' writing skills, but it also works as a platform to express their individual thoughts (Yunus et al., 2013).

#### *Cooperative learning in higher education*

Meanwhile, cooperative learning or cooperative education in higher education setting is another method to ensure active learning takes place. It is a more defined, structured method of learning that calls for active participation from each student. The instructor must function as a "task-setter" by deliberately establishing a highly structured, well-organized learning environment (Loh & Ang, 2020). Weaker students tend to quit when they faced problems but they persevere when they work together. Good students on the other hand always discover holes about their own comprehension especially when being told to give explanation and clarification of certain topics to weaker students (Felder & Brent, 2007).

The difference between collaborative learning and cooperative learning is that collaborative deals with smaller group of students with assigned academic goals and formation of groups are for immediate generation of ideas. But as for cooperative learning, it needs to be planned carefully and appropriate learning groups with specific learning goals (Kaufmann et al., 1997). Educators need to look for an apply strategies for the development of skills and attitudes to move towards self-directed learning. (as cited by Guglielmino, 2013 in Breed, 2016). It is one of the researched teaching-learning strategies because it seems promising to promote the development of self-directed learning which is cooperative learning.

Examples of cooperative learning structures such as Jigsaw and Think-Pair-Share Johnson et al (2000) as cited in (Hermmann, 2013). According to a study, these group of students did Weblogs and they valued group work, the group discussed the concepts, and each participant gave his or her point of view. As a result, the challenges were transferred (Coutinho, 2007). A recent study about integrating social media such as LinkedIn as

cooperative learning tool mentioned that it scaffolds students' learning process and besides giving constructive feedback and reflections through the learning process (Hamadi et al., 2022). Cooperative learning model, ADDIE Model (Analysis, Design, Development, Implementation and Evaluation) on E-assignment as methods for educators to produce an active, participatory and interactive learning to achieve educational goals and also an optimal development of student self-potential (Ningsih et al., 2019).

Another study done by Kagan (2021) as cited in Mogelyang (2022) on Mathematics and Science undergraduates found that when cooperative learning structures employed in any subject at any educational level, especially in higher education because it is designed to facilitate the occurrence of positive interdependence and individual accountability.

### **Methods**

A systematic review of articles published over the last 5 years was conducted following the Preferred Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The process of the systematic review are as follows:

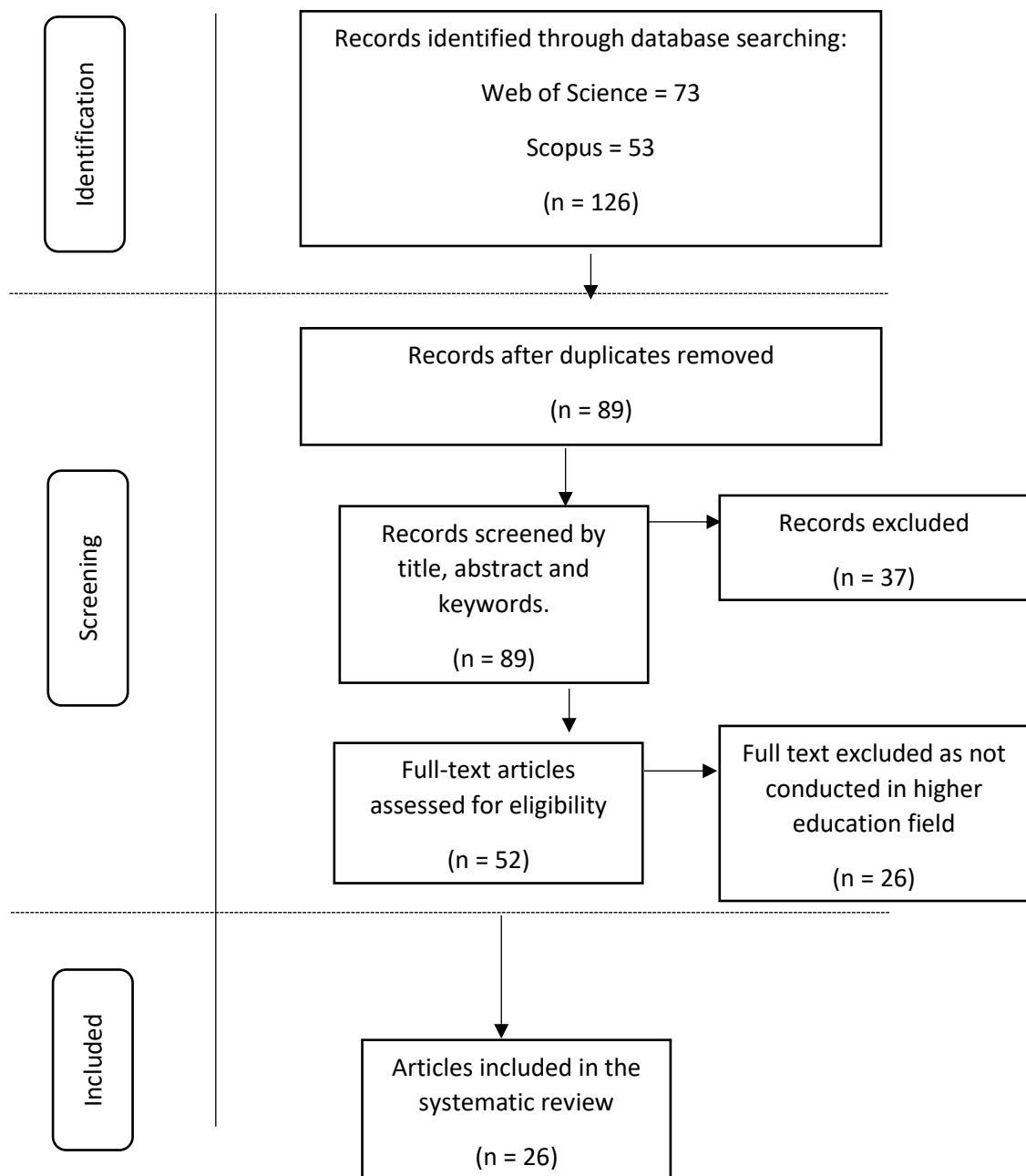


Figure 1. Flow diagram of the study.

### *Identification*

The first phase is called identification. During this process, keywords, synonyms are put together into the two databases. 126 publications were found in the first step which is identification process from the following databases: Scopus: 73 articles and Web of Science: 53 articles. After few articles excluded because they were not conducted in higher institution level, only 52 articles were left. The last stage is excluding articles which are 26 articles were not in the higher education field. Table 1 below shows the search string used in this study from each database.



Table 1

*Search string used in this study*

Database	Title 2
Web of Science (WoS)	TS=(("reflective learning" OR "reflective practice" OR "critical reflection" OR "reflective thinker" OR "reflective education") AND ("cooperative learning" OR "collaboration" OR "collaboration skill*" OR "collaborative") AND ("higher education" OR "university" OR "tertiary level"))
Scopus	TITLE-ABS-KEY(("reflective learning" OR "reflective practice" OR "critical reflection" OR "reflective thinker" OR "reflective education") AND ("cooperative learning" OR "collaboration" OR "collaboration skill*" OR "collaborative") AND ("higher education" OR "university" OR "tertiary level"))

\*: Search string

*Screening*

Once the articles have been located, the screening procedure begins. The first step in this stage was to eliminate duplicate articles from one database. 37 duplicates were eliminated after the screening process, leaving 89 items that qualified for the next stage. The following screening procedure involved screening by title, abstract, and keywords while keeping in mind that it should only cover topics related to higher education. 21 publications were ultimately removed as a result of this process since they had no relevance to the study's goal. The final step of the exclusion process resulted in the 26 articles that remained being screened by inclusion and exclusion criteria, as shown in Table 2.

Table 2

*Inclusion and exclusion criteria*

Inclusion Criteria	Exclusion Criteria
Studies conducted between 2019 and 2023 (5 years timespan)	Studies conducted before 2019
Articles from journals	Conference proceedings, review articles, book chapters, reports
The language used for the text was English	The language used was not English
Related to higher education and English Language	Not related to higher education and English Language

After being carefully selected based on the inclusion and exclusion criteria, 26 articles were included in this systematic review.

*Included*

The articles in this systematic review encompasses about higher education setting and English Language field. Table 3 displayed the studies included in this systematic review. Based on the table below, 22 articles were chosen from WoS and 21 articles were selected because of their qualities, only choosing articles from higher education. Majority of the articles; the settings are in higher education level, including universities, TVET and colleges.

Table 3

*Summary of the selected studies*

<b>Study</b>	<b>Database</b>	<b>Aim</b>	<b>Samples</b>	<b>Findings</b>
Kruger, CG.& Buley, J. (2022)	Scopus, WoS	To figure out how to encourage pre-service teachers from various educational backgrounds to evaluate critically.	Pre-service student teachers from Canada and South Africa	Collaborative reflective learning in many situations aided in the development of critical reflective abilities and gave students the chance to examine their own presumptions about what constitutes moral and ethical teaching practice.
Canabate, D. & Serra, T.	Scopus, WoS	To impart knowledge on the method for integrating cooperative and reflective learning using various pedagogical strategies.	Fourth-year students in the four-year bachelor's degree in Primary School Teacher Education at the University of Girona First set: 63 students, second set: 288 students	The outcomes showed how the non-structured method performed better than the structured one. Cooperative challenges to identify components of their professional identities assist the pre-service teachers to make sure they achieve a successful intake of durable competences.
Houde, P. (2022)	Scopus, WoS	To investigate the impact of collective accompaniment on a group of EFL teachers in Mexico and sense of community and belonging.	9 EFL teachers in Central Mexico	The dialogic setting offered by the Collective Accompaniment Model (CAM) strengthened the reflecting process.
Resch, K. et al. (2022)	Scopus	To close the gap between two "practice worlds." Namely university teacher preparation and school practice	Pre-service teachers	The research demonstrates the value of creating integrated strategies for promoting pre-service teachers' reflective practice as thorough preparation for their ensuing

				professions and offers new suggestions for pragmatic framework to teacher educators.
Quew-Jones, R. (2022)	Scopus, WoS	To deal with complexity, a work-based learning (WBL) apprenticeship course's management education must be translated into the apprentices' workplace.	6 representatives of Action Learning ambassadors	To foster stronger collaboration, value proposition, and ownership expectations; to promote the theory's application; to strengthen the apprenticeship mindset and professional identity; and to gain the support of senior management.
Bowers, S. et al. (2022)	Scopus, WoS	To describe the reflective, iterative methods to learning design used by university teachers	Seven faculty members of faculty learning design	Constant reflection is used to constructively process emotions in support of design solutions and in search of more beneficial learning outcomes.
Gkonou, C., & Miller, E. R.	Scopus, WoS	To investigate the idea of emotional capital in relation to the emotional labour of language teachers and the importance of reflection in comprehending their emotional experiences.	25 teachers in higher institutions in the United States and United Kingdom	The study demonstrates the importance of teacher reflection in the development of emotional capital as well as social and cultural capital and the contribution that emotion labor can make to emotional capital.
Howell, R. A. (2022)	Scopus, WoS	To talk about how students felt about an interdisciplinary social science ESD course that combined reflective and active learning with a "flipped classroom" concept	39 third year students on the four-year undergraduate MA (Hons) Sustainable Development degree at University of Edinburgh	The outcomes show a strong student response to the course's design and highlight a number of benefits of incorporating active learning and reflective practices to involve students in ESD.

			and cutting-edge assessments.	
Olsson, M. E. et al. (2021)	Scopus, WoS	To investigate how a teaching team applied pedagogy to the knowledge claims and ideological commitments in Academic Literacies.	Four members of IR teaching team	Formative feedback, peer review, and reflective journaling were used to fulfil the requirements of the students and deliver instruction that they found relevant.
Treacy, D. & Gaunt, H. (2021)	WoS	To investigate the possibility of a reflective matrix emphasising teamwork, collaborative learning, and ensemble practises.	12 professors and lecturers of dance, music, theatre and visual arts from University of Arts Helsinki, Finland.	The matrix offered chances to deepen our understanding of collaborative practices, notably the collective creativity that occurs inside them.
Ruge, G. & Mackintosh, L. (2020)	Scopus, WoS	To facilitate professional learning workshops with a methodology for group reflection and the formation of teaching philosophy,	22 and 26 participants from two workshops	A crucial foundation for enhancing teaching and learning is provided by reflective practice, as well as by developing one's own teaching philosophy and teaching portfolio.
Naziz, A. (2019)	Scopus and WoS	To develop a model of collaboration between polytechnic institutes and universities, one must critically consider the TVET literature already in existence, the experiences of students, and the opinions of TVET experts.	2 TVET experts, 4 TVET students and 4 students from a public university in Bangladesh.	The environment requires them to collaborate in order to maintain a flexible pathway from polytechnic institutes to universities because there is a resource dependency between them.
Mauri, T. et al. (2019)	WoS	To determine how students' roles and learning opportunities in real teaching situations	27 student teachers of Primary Education	Working together and with shared roles can increase the practicum's usefulness for teacher training.

		during their degree in 3	practicum are schools	perceived by the	The discussion and introspection can help build larger practice communities and more beneficial relationships between schools and universities.
Fernandez-Diaz, E. et al. (2019)	Scopus and WoS	To introduce the ideas of "standards" and their global development and application.	A geography minor of Bachelor Secondary Education degree at Central Queensland University		The experience's protagonists and indirect participants go through alterations that redefine their personal narratives in the context of collaborative work and professional development
Howlett, KM. & Nguyen, HL. (2020)	Scopus and WoS	To investigate the experiences of a foreign graduate teaching assistant who was co-teaching an undergraduate course.	An undergraduate at a U.S. public university		The research revealed how an IGTA's personal awareness was developed and maintained as a result of co-teaching.
Christensen, J. et al. (2021)	Scopus and WoS	To recognise and investigate the strengths and weaknesses of academic interdisciplinarity.	4 researchers from universities in Sweden		Knowledge balance involves both critical and creative thinking and behaviour. Interdisciplinary collaboration's synergies expand knowledge capacity.
Ayers, J. et al. (2020)	Scopus and WoS	To study two reflective pedagogies in a programme for sustainability leadership in a higher education setting and to emphasise the experience from the viewpoints of both students and staff.	65 students, 4 former and 1 current teacher		The reflective structure directs students' reflection towards the development of their own skills, and the utilisation of group reflection fosters productive interaction and relationships between students and teachers.

Danaher, M. et al. (2021)	Scopus and WoS	To offer a critical reflection while employing personal experience as a lens for analysis.	A geography minor in Bachelor Secondary Education degree at Central Queensland University	Collaboration between university teachers of school-based pedagogy and sustainability education content will increase the effectiveness of sustainability education in schools.
Godber, K. A. & Atkins, D. R. (2021)	Scopus and WoS	To highlight the lecturers' interpretation of theirs and their university students' responses to the unprecedented measures imposed on their lifestyle, livelihood and higher education experience (online learning).	Two lecturers, Anna and Hana (pseudonyms) in New Zealand	Professional self-observation and self-reflective practice are opportunities provided by a collaborative autoethnographic method. Reflective practice is advantageous to both professors and students.
Acree, J. (2019)	Scopus and WoS	To discuss how the collaborative approaches to evaluation (CAE) principles were applied in the conception, execution, and management of a collaborative assessment.	Southeast United States	The CAE principles promote contemplation, putting more focus on specific principles based on context-specific considerations, and posing problems when applying the ideas that arose throughout the review.
Buckingham, LR. et al. (2021)	Scopus and WoS	To investigate how co-teachers' professional relationships influence teacher learning, particular learning processes, and professional development areas.	Two professors in a private university in Madrid, Spain	The primary driver of participant learning, as well as reflection, negotiation, and transfer, centres on teaching strategies, resources, and technological application.
Uday Younis, H. A., et al. (2021)	Scopus	To assess the effectiveness of a teacher-led group	122 medical students at University	RWD, or reflection-based whole-batch discussion, is a

		discussion that followed the students' practise exercises that required reflection.	Sultan Zainal Abidin	potential method for raising academic performance, particularly when it comes to responding to essay topics.
Steel, K. M., Thompson, H. & Wright, W. (2019)	Scopus	To conceptualise and reflect on the nature of new kinds of researcher collaboration that are emerging from this altered research ecosystem.	University, externally focused research centre (eRC) & Australian National Data Service (ANDS).	To encourage small-scale changes in research culture and to showcase creative collaborations and results.
Acob, J. R. U., Dewi, Y. S., & Arifin, H. (2022)	Scopus and WoS	To investigate how nursing students perceive the COVID-19 epidemic in their day-to-day lives.	41 nursing students in a university in Phillipines	Five organising themes emerged from the thematic analysis: collaboration, caring, communication, commitment, and transformation.
Petsilas, P., et al. (2019)	WoS	To talk about the purpose of reflection in dance training and to think about embodied reflective practise in particular.	Second year dance students	In order to revolutionise dance pedagogy, reflective practice training should be treated equally to technical training and carried out through creative and embodied approaches.

Based on the table below, 26 articles were chosen from WoS and Scopus. These articles were carefully selected and examined thoroughly the quality on how the articles are related particularly in higher education and specifically in English Language subject or field.

#### *Data Analysis Procedure*

The articles were exported to Mendeley and analysis were conducted to answer the following research questions:

1. What are the academic disciplines that integrate reflective and cooperative learning in higher education level?
2. What is the importance of reflective learning and cooperative learning for sustainability in higher education?
3. What is the relationship between reflective learning and cooperative learning in higher education level?

To answer the research questions, thematic analyses were carried out. The classification of the theme based on the first research question about the disciplines that implement reflective

and cooperative learning was mentioned in the literature review. The importance of reflective and cooperative learning was classified after being identified in the articles. As for the third research question, it was classified with reference to the relationship between reflective and cooperative learning. The following section discussed the findings from the articles.

## Results

*RQ1: What are the academic disciplines that integrate reflective and cooperative learning in higher education level?*

This systematic review reveals that reflective learning and cooperative learning has been integrated across various disciplines in higher education level [1-4,6,7,9-11,13,14,16-18,20,22-25,27,29,36,39,45-51]. The table below shows the 26 articles chosen and the disciplines they are in

Table 4

*Disciplines in higher education implementing reflective and cooperative learning*

Article	Discipline/Discourses
1	Leadership education
2	Pre-service teacher training
3	History of Education, Education, Biology and Media and Communication Skills (MCS)
4	Pre-service teachers
6	English as a Second Language (ESL)
7	Faculty Learning Design
9	Bachelor of Sport and Recreation
10	Nursing
11	Education and Translation and Interpreting
21	Educational Technology
22	Dance
24	Transforming Teaching into Technology
25	Social Science
26	English Language Teaching
28	Diploma graduates and TVET
30	Social Psychological
31	Technical, Policy infrastructure and general research data management (RDM)
32	Teaching English to Speakers of Other Languages (TESOL)
33	Academic Language
35	English as a Second Language (ESL)
38	English as Foreign Language (EFL)
40	Coaching
42	Doctoral students'
43	Faculty of education
45	Social work and social care
47	Teacher educators
53	Pre-service student teachers
54	Service learning
55	Science



56	Extracurricular activities
57	Faculty of Medicine
58	English for Communication
59	Arts

Based on Table 4, English Language contributed the most number of studies related to reflective and cooperative learning which are six articles [Murugaiah & Thang, 2010; Yaacob et al., 2021; Howlett, 2020; Singh et al., 2020; Hebert, 2015; Ryan & Ryan, 2011], four articles from the education field [Christensen, 2021; Hashim & Yunus, 2018; Fernandez-Dias et al., 2019; Greenberg et al., 2021], technology contributes three articles, [3,21,24], two articles about pre-service teachers (Canabate et al., 2019; Kruger & Buley, 2022) and others contributed to one article each. These conclude that both strategies has strong relationship. The combination of these two learning strategies makes the learning more optimised, more impact and transformative learning process takes place. Therefore, interdisciplinary approaches between these two learning strategies are very advisable in HE context.

*RQ2: What is the importance of reflective learning and cooperative learning for sustainability in higher education?*

#### *Importance of reflective learning*

The second research question discussed about the importance of these two strategies for sustainable education purposes in HE.

As for reflective learning, it helps to produce results that are pertinent and helpful for solving local problems (Gkonou & Miller, 2021; Howlett, 2020). Besides, it is also in order to guarantee pedagogical proficiency for students' learning (Buckingham et al., 2021). This is as supported by an action research which used reflective entry to reflect on the ability of Think-Pair-Share to improve the speaking problem among weak ESL learners (Singh et al., 2020). Necessary changes and other improvements are made to improve speaking ability among weak ESL learners and it is found that the teacher was able to detect the events causing the problems and later reflect on suitable approaches to tackle the issue.

Moreover, through reflection on action and reflection in action, it develop an awareness of tacit knowledge and to learn from experience (Bowers et al., 2021; Petsilas et al., 2019). Reflection also cultivate a sense of belonging, curiosity, and inquisitiveness, and learn to reconcile critical and creative thinking through risk-taking (Christensen et al., 2021). It also develop a sense of community and belonging according to Houde (2022) because the students felt more at ease talking in English even there was still Malay language used, but they are willing to participate in the Question and Answer (QnA) session (Harvey et al., 2016). It also serves the purpose to select best practices that served to communicate the pedagogical approach, meet the needs of students, and provide instruction that students perceived as meaningful (Olsson et al., 2021; Fullana & Pallisera, 2016). This is supported by a local study about intergration of online quiz-games like Kahoot! and Quizziz. The pupils perceptions and elevation in motivation in learning English has shown their acceptance of the language learning because the elements of fun, enjoyment and competition makes them interested (Ryan & Ryan, 2015). An environment conducive to the development of reflective teaching practice through discipline-based capacity building (Ruge & Mackintosh, 2020) is also built as well as to encourage pupils to participate in Education for Sustainable Development (ESD) (Howell, 2021).

*Importance of Cooperative Learning*

On the other hand, the importance of cooperative learning is seen most in articles (Ayres et al., 2020; Canabate et al., 2019; Buckingham et al., 2021; Danaher et al., 2021) which is for sustainability transformation and development. Cooperative learning is one of the general principles of sustainability pedagogies which emphasises student-centred and interactive teaching and learning strategies (Yunus & Arshad, 2015). Besides, it open a space for reflecting on the actions that promote participation, collaboration and exchange between students (Danaher et al., 2021; Mauri et al., 2019; Kruger & Buley, 2022). For big sized classes, it is more practical to give feedback on their peers' works and exchange of ideas during discussion (Ryan & Ryan, 2011). Massive Open Online Courses (MOOCs), a platform to equip students with collaborative skills but also take charge of their own learning, self-discovery skills, evaluate and interact with one another (Hashim & Yunus, 2019) because the findings give insights on the usage of MOOC as one of the tools to develop ESL learning through the reflective processes (Godber & Atkins, 2021). Another digital innovation, Coggle also serves the same purposes: conduct presentations, brainstorming in groups and features corrective feedback from peers and instructors (Arulchelvan et al., 2019).

It also provides a socially constructed environment that fostered reflective practice for improved lesson planning, observations, instructional delivery and course outcomes (Howlett, 2020). A study done for Year 1 UKM students for MUET test, the instructor outlines the Information Sharing component from doing preparation until giving feedback on the topic from their discussion (Alt & Raichel, 2020). In addition, cooperative learning also ensure flexible transition opportunities to access universities (Naziz, 2020). Beside that, internships programme doing collaboration with schools seen as beneficial strategy to combine the demand for more practical experience in teacher education and offer opportunities for reflective practice (Resch et al.2022). It helps to promote effective learning as collaborative learning is interactive and assignments are in the form of reflective practice (Uday Younis et al., 2021). For instance, editing before posting comments in Padlet is a form of reflective practice because they have to be self-conscious about their posts and interactive as the instructor and their classmates can respond online (Xie et al., 2008). Last but not least, successful outcomes from the collaboration create greater awareness of open research practices (Steel et al., 2019).

*3.3 RQ3: What is the relationship between reflective learning and cooperative learning to sustain education in a higher level?*

Both learning strategies are interdisciplinary learning approaches and has cause-effect relationship when implemented in higher education. Moreover, these two practices helps to find problems, challenges and later devise solutions (Bowers et al., 2021; Canabate et al., 2019; Christensen et al., 2021; Qew Jones, 2022). When applied in a higher education level, it brings sustainability in education (Ayres et al., 2020; Howell, 2021). Continuous reflective and cooperative learning foster professional development (Christensen et al., 2021). It also contributes towards pedagogical approaches for example in Arts (Fullana & Pallisera, 2016; Brockbank & McGill, 1998) and innovative pedagogical tools like Padlet, MOOC and Coggle [50,57,59]. A more comprehensive understanding is achieved (Acree, 2019; Houde, 2022) Continuous reflective learning makes the learners make an action plan for improvements such as in teaching style (Acob et al., 2022).

Cooperative learning also develop knowledge capacities (Christensen, 2021; Ruge & Mackintosh, 2020). Besides that, it does contribute to individuals competences (Christensen et al., 2021). In addition, it does improve relationships when there's collaboration between

university and other institutions like schools, TVET (Danaher, 2021; Naziz, 2019). It does help improve knowledge, skills and attitudes through subjects or even degree programmes (Ruge & Mackintosh, 2020). Beside that, it is also important for lesson planning, instructional delivery and lesson outcomes (Howlett, 2020; Xie et al., 2008). Relationship building due (Kruger & Buley, 2022; Mauri et al., 2019; Acob et al., 2022; Steel et al., 2019) can happened because of collaboration, communication and shared understanding. Partnership programme for example between university and school is helpful to build own's educational experience through collaboration (Resch et al., 2022). Last but not least, it also promotes independent learning (Uday Younis, et al., 2021) as the learners' felt responsible towards their own learning and not dependable much on their instructor.

Both learning strategies has cause-effect relationship towards each other. As seen in articles (Ayres, 2020; Canabate et al., 2019; Godber & Atkins, 2021; Acob et al., 2022; Buckingham et al., 2021; Fernandez-Diaz et al., 2019; Quew Jones, 2022; Naziz, 2019; Steel et al., 2019; Howlett, 2020; Mauri et al., 2019; Resch et al., 2022; Kruger & Buley, 2022; Uday Younis, 2021), they are discussing about how reflective learning happens because of cooperative learning. The reflective learning is used to sustain cooperative pedagogical tools (Ayres et al., 2020) for beneficial self-reflective practice (Godber & Atkins, 2021), to improve instructional practices (Acree, 2019), to support transformative learning (Kruger & Buley, 2022) and so on. In general, reflection happens during cooperative learning to address the cooperative learning environment and to improve areas lacking in the sector. On the other hand, articles (Christensen et al., 2021; Bowers et al., 2021; Gkonou & Miller, 2021; Danaher et al., 2021; Quew-Jones, 2022; Acree, 2019; Howell, 2021; Olsson et al., 2021; Houde, 2022; Ruge & Mackintosh, 2020; Fullana & Pallisera, 2016) focused on how collaborative or cooperative learning happened because of reflective learning. The reasons are because the engagement during cooperative learning will provide critical reflection (Danaher et al., 2021), raise critical thinking for sustainable development (Christensen et al., 2021), assist communication (Bowers et al., 2021), improve educational practice (Ruge & Mackintosh, 2020) and so on. To summarise, the whole purpose was to facilitate cooperative learning so that reflective practice processes can sustain the educators' efforts for sustainable education purpose.

### **Discussion**

The results from the first research question shown the number of disciplines that integrate reflective and cooperative learning is a lot and diverse. The focus is not on education only, but it goes across various disciplines, for most subjects taught in the university.

The interdisciplinary learning strategies between reflective and cooperative learning has given benefits and are important for sustainable education across various disciplines in the university (Ayres et al., 2020; Canabate et al., 2019; Murugaiah & Thang, 2010; Bowers et al., 2021; Danaher et al., 2021; Acree, 2019; Howell, 2021; Steel et al., 2019; Naziz, 2019; Yusuf et al., 2019; Howlett, 2020; Smith, 2003; Rodgers, 2002; Diaz-Iso, et al., 2019; Uday Younis et al., 2021; Fullana & Pallisera, 2016). The first importance is these strategies develop innovative pedagogical tools such as digital learning tools Murugaiah & Thang (2010); Ryan & Ryan (2011); Halim et al (2020); Thambirajah et al (2022); Arulchelvan et al (2019) to serve the purpose of cooperative learning and reflective learning because assessment and feedbacks from educators or instructors are one form of reflective learning. Feedbacks can be written in paper or even in digital era now, lecturers can provide feedbacks for the students to review via online such as Blogs or Google Classroom. New pedagogical approaches are

established (Yunus et al., 2013; Hashim et al., 2019; Ali & Byard, 2013) to ensure the effectiveness of the strategies so that the lesson delivery, instructions and learning outcomes are achieved. Innovation such as in technology are becoming more widespread now as the instructors thought using technology is more time efficient, continuous constructive feedback and students can review the comments given at their own space which is after the lecture. Besides that, it offers improvisation of teaching and learning which supports the engagement and reflective practice.

Teaching and learning are no longer done traditionally, newer innovations kept coming in, and students eventually become more engaged because their interest and motivation increased because it is a new experience and they love the lectures more than the traditional delivery. It also brings towards professional development and competencies of the students (Awang-Hashim et al., 2019) When talking about undergraduates or postgraduates, they are trained to become professionals and this 21<sup>st</sup> century needed them to be equipped with competencies sufficient to face today's world tasks and challenges. Therefore, competencies and professional development are very important and can be developed through reflective learning when they reflect on their learning process and through social development with others, they will know how to work with other people. Moreover, it is also important for redesigning curricula or lesson planning to suit every member after receiving feedbacks (Fernandez-Diaz et al., 2019; Sassenberg & Vliek, 2019; Olsson et al., 2021; Mauri et al., 2019; Thambirajah et al., 2022).

The current curriculum can be revised, and feedbacks will become new changes. It is also important for the group members reflected on their knowledge (Colomer et al., 2020; Roche, 2022) and activities done together for sustainable competences. Sustainable competences are important to sustain higher education so that the lesson is optimised, and students understand the whole purpose of their education. The students also get deeper understanding about the learning (Colomer et al., 2020; Yaacob et al., 2021; Rodgers, 2002; Fullana & Pallisera, 2016). They understand the reasons behind why they should learn, why the event happened, and when in groups, they can do reflection together. Besides, reflective practice of their own learning is important to rebuild knowledge based on what they have learned, (Murugaiah & Thang, 2010; Fernandez-Diaz et al., 2019; Steel et al., 2019; Schon, 1983; Zafeer et al., 2023; Halim et al., 2020) what can be improved (Petsilas et al., 2019; Schon, 1987; Bubnys & Zydziunaite, 2010) and what is their next action. Cooperative learning means having common goal with similar efforts (Canabate et al., 2019; Christensen et al., 2021; Awang-Hashim et al., 2019; Sassenberg & Vliek, 2019; Naziz, 2019; Steel et al., 2019; Arulchelvan et al., 2019). It also helps in developing competences among individuals (Christensen et al., 2021; Roche, 2022; Diaz-Iso et al., 2019) and professional development through continuous learning (Christensen et al., 2021; Houde, 2022; Ruge & Mackintosh, 2020).

A significant amount of research reviewed in this analysis has shown that the relationships between reflective and cooperative learning have an impact towards one another. When reflection happens in a cooperative or collaborative learning environment, it fosters independent learning (Murugaiah et al., 2010; Greenberg et al., 2021; Harvey et al., 2016; Yaacob et al., 2021; Yusuf et al., 2019; Kruger & Buley, 2022; Bruno & Dell' Aversana, 2018). Independent learning or known as self-directed learning or also known as learner centered

learning can be developed through reflective and cooperative learning. Students are responsible for their own learning and the learning goals they shared with their group members. Moreover, it also elicits critical and creative thinking (Acree, 2019; Howell, 2021; Schon, 1983; Shapiro, 2010) to handle problems and challenges (Colomer et al., 2020; Bowers et al., 2021; Quew-Jones, 2022; Olsson et al., 2021; Miettinen, 2000). These thinking skills are important in higher education because most tasks require higher order thinking skills. Group tasks also need all the members to think of solutions together.

On the other hand, communication and interaction is the key feature of cooperative learning (Murugaiah et al., 2010; Godber & Atkins, 2021; Fernandez-Diaz, 2019; Yaacob et al., 2021; Sassenberg & Vliek, 2019; Ruge & Mackintosh, 2020; Coutinho, 2007; Hamadi et al., 2022) When cooperation or collaboration takes place during reflective learning, the sense of belonging, togetherness, (Awang-Hashim et al., 2019; Singh et al., 2020) and feeling comfortable sharing of ideas despite their differences within the groups are developed (Howell, 2021; Sassenberg & Vliek, 2019; Yusuf et al., 2019; Houde, 2022; Uday Younis et al., 2021). The students felt like they belonged to the group and they will not feel left out because what they learned matters and equal for all. Undeniably, students' participation and motivation increased when doing work together. (Awang-Hashim et al., 2019; Murugaiah et al., 2010; Treacy & Gaunt, 2020; Thambirajah et al., 2022; Arulchelvan et al., 2019).

### **Conclusions**

From this systematic review, both reflective and cooperative learning have an impact towards each other for sustainable education and has strong relationships because both inculcate important elements into higher education. These two strategies are important because they both offered benefits in the field they are applied to, either education, arts, business, doctoral, nursing, communication and many more. The articles from the two databases used, the Web of Science (WoS) and Scopus after the inclusion and exclusion criteria has finalised them into 26 articles. The main findings from this systematic review found that reflective and cooperative learning has strong relationships because both can have interdisciplinary connections with each other. The cause and effect between them when reflective approach is implemented in cooperative learning and vice versa can be proven in the articles included in this review. Both cause and effect are visible towards the individuals or the group. The importance of these two strategies to sustain education is also obviously stated. They serve the purpose of knowledge building, self-directed learning, to develop competencies which later move towards successful learning outcomes. There are still some areas for future researchers such as the integration of reflective and cooperative learning among polytechnic students, undergraduates or postgraduates, for example undergraduates majoring in Teaching English as a Second Language (TESL) or even other majors.

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