Indonesian Journal of Classroom Action Research

Journal homepage: https://journal.das-institute.com/index.php/ijcar

Research Article

The Development of learning activities linking life skills and Bio Circular Green Economy (BCG) in Biology subjects for High school students of Mahasarakham University Demonstration School (Secondary), Thailand

Wutthisak Bunnaen[1]*, Nichapat Jirapangoonrachat[2], Nathamon Sangsaikaew[3] , Phanat Phothibat[4], Wittaya Worapun[5], Autthapon Intasena[5*]

[1,2,3] *Teacher of Mahasarakham University Demonstration School (secondary), Thailand.*

[4] *Faculty of Fine-Applied Arts and Cultural Science, Mahasarakham University, Maha Sarakham, Thailand.*

[5] *Faculty of Education, Mahasarakham University, Thailand*

Article Info

Article history:
Received 14 November 2024
Revised 9 December 2024
Accepted 5 January 2025
Available online 30 January 2025

Keywords:
Professional Learning Community (PLC), Life skills, Bio-Circular-Green Economy (BCG).

Abstract

This research focuses on the development of learning activities that integrate life skills and the Bio-Circular-Green Economy (BCG) concept within the biology curriculum for upper secondary students at the Mahasarakham University Demonstration School (Secondary). The objectives of the study were to develop learning activities, enhance students' reflective thinking processes, promote their self-development, and assess student performance. The target group consisted of Grade 10 students from classes 4/1 and 4/2. The classroom action research methodology was employed, integrated with the Professional Learning Community (PLC) model, referred to as the Professional Learning Community Classroom Action Research (PLC-CAR). The research found that the comparison of the mean scores of students' reflective thinking skills between Group 1 and Group 2 showed a statistically significant difference at the .05 level. However, the comparison of mean scores for student performance evaluation in specific areas between the two groups showed no significant difference. Similarly, the analysis of the mean scores of students' self-assessment indicated no significant difference between the two groups, with both groups reporting a high level of self-assessed performance. In conclusion, the learning activities developed to integrate biology content with life skills and the BCG economic model effectively encouraged students to engage in self-directed learning, collaborate with others, develop reflective thinking abilities, and apply knowledge for personal and community benefit. These outcomes align with the principles of effective 21st-century learning.

Introduction

In the digital age of the 21st century, change occurs rapidly and constantly. It is an era in which individuals must be highly adaptable and capable of coping with continuous transformations. Essential competencies in this context include technological literacy, innovation skills, vocational abilities, and most importantly, life skills. These life skills are crucial for living and functioning effectively in an increasingly complex and competitive socio-economic environment. The term "skill" refers to a person's clarity and proficiency in a specific area, which can be developed through learning, action, or practice. Skills that are essential for daily living are referred to as livelihood skills or skills for living. These differ from life skills, as defined by Prasert Tansakun (2008). Life skills are defined by the World Health Organization (WHO) as "a group of psychosocial competencies and interpersonal skills that help people make informed decisions, solve problems, think critically and creatively, communicate effectively, build healthy relationships, empathize with others, and cope with and manage their lives in a healthy and productive manner. Life skills may be directed toward personal actions or actions toward others, as well as actions to change the surrounding environment to support health." Taking WHO's definition into account, a basic life skills curriculum equips youth with the emotional, social, and intellectual tools necessary for personal success—whether at the individual level, within interpersonal relationships, or in community and workplace settings. These skills prepare learners to meet the daily challenges and demands of life, from emotional regulation to informed decision-making. Moreover, life skills help foster the development of students' personalities, abilities, and physical and mental capacities. They empower learners to recognize their true potential by learning about themselves and others, making effective decisions, and living harmoniously in society. Incorporating life skills into essential learning tools is vital for survival, potential development, and quality of life. It has also been recognized that all young people and adults have a fundamental human right to benefit from education that includes learning to know, to do, and to live together—emphasizing the importance of coexistence alongside academic knowledge UNICEF, (2024).

Accordingly, the Mahasarakham University Demonstration School (Secondary) is an educational institution that emphasizes a learner-centered approach, based on the belief that all individuals are capable of learning and reaching their full potential. Learning in each subject should involve integrated instructional activities that promote the development of 21st-century skills in Grade 10 biology, a foundational course, students explore diverse topics and engage in laboratory activities that connect their learning to living organisms and the environment. In light of this, the researcher is interested in developing learning activities that

* [1] Corresponding author.
E-mail address: wutthisakcomplete@gmailcom (Wutthisak Bunnaen).

integrate life skills and the Bio-Circular-Green (BCG) Economy, with the aim of fostering both knowledge and life skills. Connecting learning with the BCG economy encourages creativity and the innovative use of biological resources. This initiative targets Grade 10 students at the Mahasarakham University Demonstration School (Secondary).

Methodology

The sample were 2 classroom from Grade 10 students at the Mahasarakham University Demonstration School (Secondary) they were selected using a cluster random sampling technique. The research design was based on a form of classroom action research integrated with a Professional Learning Community (PLC-CAR), which is a type of qualitative research. This approach involves teachers engaging in professional learning communities, combining inquiry-based processes with data collection and reflection to address problems and improve classroom teaching practices, thereby enhancing student learning effectiveness. The study followed the action research framework by Kemmis and McTaggart (1988), comprising four cyclical phases 1. Planning: Content exploration, literature review, identification of relevant phenomena, instructional activity design, and development of lesson plans aligned with the identified phenomena. 2. Acting: Implementation of instructional activities using a phenomenon-based approach. 3. Observing: Observation and recording of students' learning development through instructional activities and student performance assessments. 4. Reflecting: Reflection on the instructional process in each phase, with student participation in both reflection and self-evaluation.

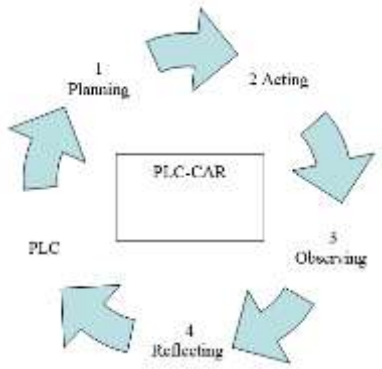

Figure 1. Step of PLC-CAR

Research Instruments:

1. Lesson plans integrating life skills and the Bio-Circular-Green (BCG) Economy concept.
2. Performance assessment forms and student reflection tools linked to life skills and the BCG Economy.
3. Student self-assessment tools.
4. Project-based assessment tools aligned with STEM and the BCG Economy, adapted from Wiriya Woraphan and Assoc. Prof. Dr. Prasart Nueangchalerm (2019

Instrument Development and Validation

The instruments (lesson plans, performance assessments, reflection tools, self-assessments, and project-based assessments) were developed collaboratively through teacher meetings within the Professional Learning Community (PLC). The tools were analyzed and validated by content experts using the Index of Item-Objective Congruence (IOC), with the following scoring criteria:

+1 = Clearly appropriate
0 = Uncertain
–1 = Clearly inappropriate

Only items with IOC values ≥ 0.50 were retained. Additionally, the tools' suitability was assessed by experts using a five-point Likert scale:

5 = Most appropriate
4 = Very appropriate
3 = Moderately appropriate
2 = Slightly appropriate
1 = Least appropriate

Mean scores were interpreted based on Boonchom Sisa-at (1992: 100) as follows:

4.51–5.00 = Most appropriate
3.51–4.50 = Very appropriate
2.51–3.50 = Moderately appropriate
1.51–2.50 = Slightly appropriate
1.00–1.50 = Least appropriate

Instruments with average scores ≥ 3.51 were considered suitable for use. Interpretation of the Research Instrument Evaluation Scores:

4.51–5.00	**indicates**	**highest level**
3.51–4.50	**indicates**	**high level**
2.51–3.50	**indicates**	**moderate level**
1.51–2.50	**indicates**	**low level**
1.00–1.50	indicates	lowest level

Data Collection

Phase 1:

1. The conference was held with biology teachers participating in the project who were teaching Grade 10 students. The objective was to collaboratively plan instruction, set goals, and define learning objectives.
2. The Professional Learning Community (PLC) meeting was conducted, during which participating teachers jointly analyzed and developed assessment tools—specifically, a student reflection evaluation form integrating life skills and the Bio-Circular-Green (BCG) Economy, as well as a student self-assessment form
3. The academic experts in science and biology were invited to join the PLC meetings to help develop learning activities and co-design lesson plans that integrated life skills and the BCG Economy. These experts also participated in open-class sessions.
4. Instructional activities were implemented through classroom action research based on the following steps: (1) Planning – design of learning plans based on real-world phenomena; (2) Acting – implementation of learning activities as planned; (3) Observing– monitoring and documenting student learning progress; (4) Reflecting–students reflected on their learning experiences and presented their projects or practical work related to life skills and the BCG Economy. Open-classroom activities were conducted simultaneously, allowing peer teachers, school administrators, and subject-matter experts to observe and provide feedback.
5. The post-instruction meeting was conducted to analyze classroom observations and discuss whether the expected student learning outcomes were achieved in tangible terms.

Phase 2:

1. The observation results and meeting discussions with experts were used to improve the learning activities. Revisions were made, and new lesson plans for Unit 2 were developed based on those improvements.
2. The another round of open-classroom learning activities was conducted, following the same action research cycle: (1) Planning, (2) Acting, (3) Observing, (4) Reflecting.
3. Students reflected on their experiences, presented projects related to life skills and the BCG Economy, and participated in classroom sessions observed by teachers, administrators, and experts. Student performance was evaluated using the previously developed assessment tools.
4. The second post-lesson meeting was held to assess classroom implementation and discuss whether student learning outcomes were becoming more concrete. Observational data were analyzed for this purpose.

Phase 3:

1. The Results from observations and expert discussions were again used to revise the instructional design. Lesson plans and learning activities for Unit 2 were refined accordingly.
2. A third round of open-class learning sessions was conducted using the classroom action research model, repeating the four steps of the cycle. Students continued to present project or design work related to life skills and the BCG Economy, and open-classroom observations were carried out with participation from teachers, administrators, and experts. Student engagement and performance were evaluated using the assessment instruments.
3. The final discussion was conducted to reflect on instructional practices, observations, and student learning outcomes, emphasizing the extent to which those outcomes were clearly achieved.
4. Students completed self-assessment forms based on their experiences across all five instructional units.

Data Analysis

Descriptive statistics including mean and standard deviation were employed. Hypothesis testing was conducted using the independent t-test at the 0.05 level of significance.

Result

Development of Biology Learning Activities Integrating Life Skills and the BCG Economy. The researcher developed five biology lesson plans for Grade 10 students that integrate life skills and the Bio-Circular-Green (BCG) Economy. Each lesson plan incorporates biology laboratory activities as a core component of the learning process. These practical activities are designed to promote students' learning skills and reflective thinking. They also encourage students to engage in hands-on experimentation, conduct research, and expand their knowledge by creating mind maps and designing connections between learning outcomes and the principles of the BCG economy.

The learning activities emphasize the application of biological knowledge and living organisms in daily life and community contexts. Furthermore, students are guided to recognize and develop the value and benefits of biological resources in accordance with BCG economic principles.

Table 1 Assessment of student reflection by t-test (independent)

Issue	Group 1			Group 2			*t*	P
	$\overline{X}$	S.D	Level	$\overline{X}$	S.D	Level		
Assessment of student reflection	4.47	0.63	High	4.66	0.58	Very high	-5.608	.001*
Assessment of student performance	4.42	0.56	High	4.50	0.54	High	-1.539	0.131
Self assessment of students	4.08	0.71	High	4.24	0.66	High	-.948	.362

* Statistical significance at the .05 level

The table 1, the results of the comparison of the average value of the assessment of students' reflective thinking skills from the learning activities linking life skills and the BCG economy (Bio Circular Green Economy) in the Biology subject of students in Group 1 and Group 2 found that students in Group 1 and Group 2 had significantly different reflective thinking skills at a statistical level of .05, with students in Group 2 having an overall average score of 4.66, which is at the highest level, higher than students in Group 1 who had an overall average score of 4.47, which is at a very high level.

Table 2 compares the average scores of the evaluation results of each aspect of the students in group 1 and group 2 (n=35) using the t-test (independent) statistics. Table 2 found that of the comparison of the average results of the evaluation of each aspect of the students' work from the learning activities linking life skills and the BCG economy (Bio Circular Green Economy), Biology subject, of students in Group 1 and Group 2, found that students in Group 1 and Group 2 had scores for the evaluation of each aspect of the students' work that were not different, with students in both Group 1 and Group 2 having average scores at a very high level.

Table 3 compares the average scores of the learners' self-assessment of the students in group 1 and 2 (n=35) using the t-test (independent). Table 12 found that the average scores of the learners' self-assessment from the learning activities linking life skills and the BCG economy (Bio Circular Green Economy) in the biology subject of the students in sample group 1 and sample group 2 were not different. The self-assessment of the learners was at a high level in both groups.

Discussion

The results of the Development of Biology Learning Activities Integrating Life Skills and the BCG Economy in researcher developed five lesson plans for Grade 10 biology that integrate life skills and the Bio-Circular-Green (BCG) Economy. These included: (1) Microscopy and Cell Practices; (2) Biomolecules in Living Organisms and Biochemical Testing; (3) Invertebrates and Dissection of Insect Anatomy and Physiology in the Environment; (4) Vertebrates and Frog and Fish Anatomy Dissections; and (5) Plant Diversity and Ethnobotany of Dry Dipterocarp Forest Plants. The research found that integrating life skills and the BCG Economy into biology learning activities effectively enhanced students' reflective thinking, communication, and life skills. This was particularly evident in their ability to link biological knowledge

with real-life contexts and apply their understanding in community-based settings.

These outcomes are consistent with the perspective of Trilling & Fadel (2009), who emphasized that 21st-century education should equip learners to apply knowledge in real-world problem-solving, engage in self-directed learning, and collaborate effectively with others. All five developed lesson plans featured inquiry-based and hands-on learning activities grounded in Model-Based Learning and systems thinking. These encouraged students to investigate, analyze, and design models linking biological knowledge with BCG principles. Notably, the ethnobotany lesson on dry dipterocarp forest plants enabled students to reflect on the value of local biological resources and propose sustainable conservation and utilization strategies. This approach aligns with the findings of Phothisak Phothisen and Chatree Faikhamta (2017), who highlighted the efficacy of model-based learning in fostering scientific thinking, conceptual integration, and reflective reasoning. The evaluation of students' reflective thinking skills in both study groups indicated high to very high average scores. Group 2 demonstrated statistically significantly higher mean scores, which may be attributed to classroom dynamics or leadership factors that promoted collaboration and cooperative learning Johnson & Johnson, (2009).

Nevertheless, both groups exhibited clear trends suggesting that participatory, practice-based, and reflective learning activities are beneficial across multiple skill domains. These findings align with Kolb's (1984) experiential learning model, which emphasizes a cycle of concrete experience, reflection, abstract conceptualization, and active experimentation. In terms of STEM-based performance assessments connected to the BCG economy, students demonstrated strong abilities in teamwork, communication, and active participation. This suggests that the researcher-designed activities fostered high-quality collaboration and met the goals of integrated learning, which aims to highlight interdisciplinary knowledge connections. The comparison of students' performance scores across both groups showed no significant differences. Both groups achieved high average scores, indicating the stability and consistency of the learning activity design. The equivalence in student experiences—through similarly structured hands-on activities—led to comparable learning outcomes. This trend supports Slavin's (1995) theory that well-structured cooperative learning, when facilitated appropriately, enhances both academic achievement and collaborative behavior across diverse learning environments.

Furthermore, the results align with Bybee (2013), who advocates for learner-centered STEM education that promotes active learning and analytical thinking in real-world contexts. The consistency in outcomes suggests that learning activities rooted in BCG-biological integration can be equitably applied across various contexts, providing all students with opportunities to demonstrate their full potential. The absence of statistically significant performance differences between groups indicates that creative, hands-on activities integrating BCG and biology are sufficiently robust to bridge academic disparities and promote equitable development of life skills. This supports educational equity, as emphasized by UNESCO (2015), which advocates for high-quality learning designs that reduce disparities and ensure all learners achieve meaningful outcomes. Additionally, students' self-assessment results showed a strong understanding of their roles in the learning process and their ability to apply knowledge to their lives and communities. This reflects growth in lifelong learning skills and readiness to become 21st-century citizens UNESCO, (2015). In conclusion, the BCG-integrated biology learning activities developed in this study promoted self-directed learning, collaboration, reflective thinking, and the application of knowledge for personal and community benefit. These outcomes provide strong support for effective 21st-century learning models.

Conclusion and Recommendation

Assessment Results of Students' reflective thinking skills from Biology Learning Activities Integrating life skills and the BCG (Bio-Circular-Green Economy) The assessment of reflective thinking skills among Grade 10/1 students (Group 1, n = 35) who participated in biology learning activities integrating life skills and the BCG economy revealed that the students achieved high average scores in several areas. These included: reflective thinking and analytical skills in information-seeking and explanation; communication skills in terms of content comprehension; and life skills in relation to understanding and linking biological knowledge with BCG economic principles, which were rated at the highest level.

Meanwhile, the students scored at a high level in communication skills related to verbal and written reporting, media and presentation formats, and in reflective thinking skills concerning the application of scientific principles, task completion, and the ability to link learning content with life skills. Furthermore, students demonstrated the ability to apply life skills in practice and produce creative work reflecting BCG economic principles. Overall, the average score across all reflective thinking skill dimensions was 4.47, indicating a high level. In Group 2 the assessment results showed that students achieved the highest level across all aspects of communication, reflective thinking, and life skills, including the integration of BCG principles. The overall average score across all dimensions was 4.66, which is at the highest level.

The comparison of the mean scores between Group 1 and Group 2 revealed a statistically significant difference in students' reflective thinking skills at the 0.05 level. Specifically, Group 2 had a higher average overall score of 4.66 (highest level), compared to Group 1, which had an average of 4.47 (high level). Assessment of Student Performance Based on STEM Approaches Integrating Life Skills and the BCG Economy for Group 1, the overall average score of student performance based on the STEM approach integrating life skills and the BCG economy was 4.42 (high level). The highest scores were observed in teamwork evaluation, particularly in item 6 (cooperation and task-sharing among team members) and item 8 (listening to and exchanging ideas with others). Communication and performance scores in all other criteria remained at a high level. In Group 2, students showed the highest scores in teamwork evaluation for item 6 (cooperation and task-sharing), item 7 (engagement and interest during the task), and item 8 (listening to and exchanging ideas with others). The overall average score of performance across all dimensions was 4.50, which also indicates a high level. All aspects of communication and STEM-integrated performance were rated at high or highest levels. The comparison of the mean scores between Groups 1 and 2 showed no significant difference in student performance evaluation across dimensions. Both groups achieved average scores at a high

level, suggesting that the learning activities provided consistent and equitable learning experiences.

Students' Self-Assessment Results

The average scores of students' self-assessment from both Group 1 and Group 2, who participated in biology learning activities integrating life skills and the BCG economy, were rated at a high level for all items. The overall average score was also at a high level. The comparative analysis of self-assessment scores showed no significant differences between Group 1 and Group 2. Students in both groups evaluated themselves at a high level, indicating that the designed learning activities successfully promoted self-awareness and the application of knowledge in personal and community contexts.

Therefore, the instructional process should aim to develop both academic knowledge and life skills simultaneously. Learners should be encouraged to apply the acquired knowledge in their daily lives or in connection with their surrounding environment and learning activities should be developed to integrate life skills and the Bio-Circular-Green (BCG) economy with the Project-Based Learning (PBL) approach, in order to enhance practical application, problem-solving, and contextual understanding.

Reflective Thinking and Information Processing

The observed high average scores in "reflective thinking and analytical skills in information-seeking and explanation" (Group 1) underscore the effectiveness of the integrated biology learning activities in fostering higher-order thinking. This aligns with Dewey's (1933) concept of reflective thought, which emphasizes active, persistent, and careful consideration of any belief or supposed form of knowledge in light of the grounds that support it and the further conclusions to which it tends. Students demonstrated an ability not merely to recall facts but to process, analyze, and synthesize information, a crucial skill in the age of information overload (Jonassen, 2000). The integration of life skills and the Bio-Circular-Green (BCG) economy likely provided authentic contexts for this information processing, allowing students to see the practical relevance of biological concepts beyond textbook definitions (Herrington & Herrington, 2006).

Communication Skills and Knowledge Transfer

The varying levels of communication skills observed between groups provide valuable insights. While Group 1 achieved "high level" in "verbal and written reporting, media and presentation formats," Group **2** attained the "highest level across all aspects of communication." This disparity could be attributed to a multitude of factors, including prior exposure to communicative tasks, instructional design variations between the groups, or even subtle differences in teacher facilitation (Means et al., 1993). Effective communication is not merely about conveying information but also about articulating understanding, engaging in critical discourse, and collaborating effectively Sfard, **(**2008). The success in communication, particularly in "content comprehension," suggests that students were able to internalize complex biological and BCG principles and translate them into understandable language, indicative of deep learning rather than superficial memorization (Hattie & Timperley, 2007**).**

Integration of Life Skills and BCG Principles. The consistent high scores in "life skills in relation to understanding and linking biological knowledge with BCG economic principles" across both groups highlight a significant achievement of the curriculum design. This outcome is particularly pertinent given the growing emphasis on 21st-century skills which include critical thinking. The successful integration of BCG principles within biology provides a tangible framework for students to apply their knowledge to real-world challenges such as sustainable development, resource management, and circular economy models. This practical application fosters a deeper understanding and appreciation for the interdisciplinary nature of scientific knowledge Kolb, (1984). The ability to produce "creative work reflecting BCG economic principles" further demonstrates the transformative potential of such integrated learning approaches, moving beyond rote learning to innovative problem-solving.

STEM Approach and Collaborative Learning

The assessment of student performance based on the STEM approach further reinforces the positive impact of the learning activities. The high scores in teamwork evaluation, particularly in "cooperation and task-sharing" and "listening to and exchanging ideas with others," underscore the effectiveness of collaborative learning environments. Vygotsky's, (1978). The consistent high scores in communication and performance across various STEM criteria suggest that the integrated approach successfully cultivated a holistic set of skills, encompassing not only scientific knowledge but also practical application and interpersonal effectiveness. The lack of significant difference between Group 1 and Group 2 in STEM performance indicates the robustness and equitable nature of the designed learning experiences.

Self-Assessment and Metacognition

The high levels of student self-assessment across both groups are a strong indicator of developing metacognitive abilities. Metacognition, defined as "thinking about thinking," involves the ability to monitor and regulate one's own learning Flavell, (1979). When students accurately assess their own understanding and application of knowledge, it demonstrates self-awareness and a capacity for reflective learning. The consistency in self-assessment scores between the groups suggests that the learning activities were uniformly effective in promoting this crucial skill. This outcome is particularly important as self-directed learning and continuous personal development are vital for navigating an increasingly complex world Zimmerman, (2000).Pedagogical Implications and Future Directions. The findings strongly support the integration of life skills and the Bio-Circular-Green (BCG) economy within biology education, particularly when combined with a Project-Based Learning (PBL) approach. This pedagogical strategy fosters: Deeper Conceptual Understanding: By connecting abstract biological concepts to real-world issues, students develop a more profound and lasting understanding. Development of 21st-Century Skills: The emphasis on critical thinking, problem-solving, communication, collaboration, and creativity prepares students for future academic and professional challenges. Enhanced Student Engagement and Motivation: Authentic tasks and relevant contexts increase student interest and intrinsic motivation. Promotion of Metacognitive Skills: Self-

assessment and reflective practices empower students to take ownership of their learning.

Future research could explore the long-term impact of such integrated curricula on students' career choices, civic engagement, and commitment to sustainable practices. Further investigation into specific instructional strategies that optimize the development of particular reflective thinking sub-skills would also be beneficial.

References

Boonchom, S. (1992). Basic research (2nd ed.). Suweeriyasarn.

Dewey, J. (1933). How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process. *D.C. Heath and Company*.

Bybee, R. W. (2013). The case for STEM education: Challenges and opportunities. NSTA Press.

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist,* 34(10), 906–911.

Hattie, J., & Timperley, H. (2007). The Power of Feedback. *Review of Educational Research,* 77(1), 81–112.

Herrington, J., & Herrington, A. (2006). What is an authentic learning environment? Authentic Learning Environments in Higher Education, 1–13.

Johnson, D. W., & Johnson, R. T. (2009). An educational psychology success story: Social interdepend dence theory and cooperative learning. *Educational Researcher*, 38(5), 365–379. https://doi.org/10.3102/0013189X09339057

Kemmis, S., & McTaggart, R. (1988). The action research framework. In S. Kemmis & R. McTaggart (Eds.), T*he action research planner* (pp. 1–28). Deakin University Press.

Kolb, D. A. (1984). Experiential learning: Experience as the source of learning and development. *Prentice-Hall*.

Means, B., Borys, J., & Olson, K. (1993). The performance of students in problem-solving research projects. *SRI International.*

Phothisak, P., & Chatree, F. K. (2017). How should I develop high school students' conceptual models on the rate of chemical reactions? A classroom action research. *Journal of Research Unit on Science, Technology and Environment for Learning*, 8(1). Faculty of Education, Kasetsart University, Bangkok.

Prasart, N. (2017). Instructional research. *Chulalongkorn University Press.*

Prasert, T. (2008). Self-maintenance skills. *Khaofang Publishing*, *Suweeriyasarn.*

Slavin, R. E. (1995). Cooperative learning: *Theory, research, and practice (2nd ed.)*. Allyn & Bacon.

Sfard, A. (2008). Thinking as communicating: Human development, the growth of discourses, and mathematizing. *Cambridge University Press*.

Trilling, B., & Fadel, C. (2009). 21st century skills: Learning for life in our times. Jossey-Bass. *https://curriculumredesign.org/wp-content/uploads/21st-Century-Skills-Book-Excerpt.pdf*

UNESCO. (2015). Rethinking education: Towards a global common good?. *United Nations Educational, Scientific and Cultural Organization.* https://unesdoc.unesco.org/ark:/48223/pf0000232555

UNICEF. (2024). Knowledge brief: Basic life skills curriculum. https://www.unicef.org/azerbaijan/media/1541

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. *Harvard University Press.*

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–39). Academic Press