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Implementation of Chemo-entrepreneurship through Project-based Learning to Determine the Level of Students' Soft Skills and Learning Motivation

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ABSTRACT Many factors in teaching chemistry influence students' soft skills and learning motivation. An attractive model is important in determining students' success in chemistry learning. This research aims to determine the level of soft skill abilities and students' learning motivation in implementing chemoentrepreneurship through project-based learning. The research methodology is quasi-experimental. In this study, 60 students were randomly selected from 162 MIPA class students who were grouped into 30 students in the experimental class and 30 in the control class. To determine the level of students' soft skill abilities and learning motivation, a survey was conducted on their learning activities. The N-gain value of learning motivation in the experimental class and control class was obtained at 0.68 and 0.40 (medium), while the N-gain value of soft skills was obtained at 0.63 (medium) and 0.28 (low). The percentage of learning motivation and soft skills in the experimental class with an average post-test of 84.68% and 80.54% (high), while in the control class with an average post-test of 73.53% and 68.33% (medium). The student soft skill and learning motivation hypothesis test findings show a substantial difference between the experimental and control classes.

Keywords Chemo-entrepreneurship, Project-based learning, Learning motivation, Soft skill

1. INTRODUCTION

Chemistry is a science that cannot be separated from experimental activities. In essence, chemistry learning consists of products, processes, and attitudes that require students to make discoveries and solve problems (Sumarti, Aris & Aini, 2018). All aspects of human life are always related to chemical concepts. However, learning to date has not fully enabled students to understand chemical concepts at various levels of education.

Based on observations made at SMAN 5 Banda Aceh, learning activities have only been teacher-centered. The learning process is rarely in groups or discussions. Students only review the learning outcomes delivered by the teacher without developing knowledge through everyday facts. The computer-based national examination was implemented by the Ministry of Education and Culture, and was held inaugurally in the 2017/2018 school year. Based on data on the percentage of UNBK scores in the 2017/2018 and 2018/2019 school years, chemistry subjects at SMAN 5 Banda Aceh, respectively, especially on acid-base materials, namely 40 and 42%, which are included in the category of less than the percentage at the national level (Puspendik, 2019).

Facts on the ground are one of the issues showing that learners consider chemistry lessons the most difficult lessons. Students' ignorance of the uses of chemicals in everyday life is the cause of their disinterest and getting bored quickly. This disinterest affects learning motivation and soft skills, affecting learning achievement outcomes. The higher the learning achievement, the higher the

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motivation to learn (Dindar, 2016; Hamidah & Kamaludin, 2018; Tukiran, Suyatno & Hidayati, 2017; Sumarti, Aris & Aini, 2018).

The chemo-entrepreneurship (CEP) method will focus learning activities on experimental learning based on practical activities, conversations, and problem-solving so that students may gain practical experience with environmental chemicals. Learning CEP on chemistry helps improve soft skills, entrepreneurship interest, and memory of more topics (Dewi & Mashami, 2019; Tukiran, Suyatno & Hidayati, 2017).

Applying the project-based learning (PjBL) model through CEP can help teachers provide hands-on, active, creative experiences and develop learners' attitudes, skills, and knowledge. The CEP approach becomes more applicable, equipping problem-solving, creative thinking, and good communication skills. In addition, chemistry learning becomes more fun, more active, innovative, insightful, independent, and unyielding, and fosters an entrepreneurial spirit (Aslan, 2017; Hendrawan & Sirine, 2017; Herborn, Stadler & Mustafic, 2020; Sumarti, Aris & Aini, 2018; Swiecki, Ruis, Farrell & Shaffer, 2019; Wibowo & Ariyatun, 2018; Zubaidah, Fuad & Suarsini, 2017).

Learning by applying the CEP approach provides opportunities for students to practice making products that have economic value. Increased learning motivation affects success in the learning process, shapes student soft skills, and can improve the quality of learning (Barba & Atienza, 2017; Karyadi, Paristiowati & Afrizal, 2020; Rodriguez, Diez, Perez, Banos & Cario, 2019).

The appropriate model may be used to instruct learning using the CEP technique by utilizing the PjBL model. In the PjBL paradigm, students actively design a project related to the course topic. To foster critical thinking creativity and enhance problem-solving abilities, the PjBL model is used (Issa & Khataibeh, 2021; Mahasneh & Alwan, 2018; Herborn, Stadler & Mustafic, 2020; Mohamadi, 2018; Saenab, Yunus & Husain, 2019; Wibowo & Ariyatun, 2018).

Relevant research on PjBL learning with the CEP approach is based on real-world activities, tasks, and challenges, emphasizing problem-solving and scientific, logical, and systematic thinking. The CEP technique of the PjBL learning paradigm is good for increasing learners' motivation and soft skills (Devi, Ismanto & Kristin, 2019; Marnita, Taufiq, Iskandar & Rahmi, 2020; Nuha, Febriana & Merdekawati, 2020; Ruliyanti, Supartono & Wijayati, 2018).

Acid-base is the chemical substance used in the application of CEP-PjBL. After the class, learner-centered learning will have produced a product. Because CEP-PjBL can utilize all of its skills to seek and analyze things systematically, critically, logically, and analytically, it is used in acid-base chemistry (Ismuwardani, Nuryatin & Doyin, 2019).

The actual product that can be developed in this study is processing jelly candy from papaya leaves and orange peel. The jelly harvester is very useful for consumption by ulcer sufferers, and it contains vitamin C and can be used as a product in entrepreneurship. The manufacture of these products gives students direct experience to increase learning motivation, soft skills, and entrepreneurial interest (Devi, Ismanto & Kristin 2019; Nuha, Febriana & Merdekawati, 2020; Ruliyanti, Supartono & Wijayati, 2018).

This study will evaluate the PjBL-CEP of student soft skills and learning motivation between the experimental and control classes to see which is more beneficial for success and long-term learning. The research that employs various methodologies also serves as a model for subsequent studies by creating and executing PjBL-CEP learning. Furthermore, this study will be a reference for researchers collaborating to implement innovative learning approaches in scientific education. This study will substantially contribute to the field because research that concurrently evaluates the influence on success and permanent learning is uncommon.

The various research results above show that to determine the soft skills abilities and level of student learning motivation through the implementation of CEP-based PjBL. The successful implementation of a learning model that impacts increasing students' soft skills and motivation is essential for long-term educational goals. This research aims to determine the level of soft skill abilities and students' learning motivation in implementing CEP through PjBL

2. METHOD

2.1 Research Design

The study employed a quasi-experimental design with pre-test and post-test control groups (Karasar, 2003). According to Creswell (2003), the experimental procedure should allocate individuals entirely randomly to either the experimental or control groups. Table 1 provides a summary of the testing process.

Table 1 Group pretest posttest design

Group	Pretest	Treatment	Posttest
Experimental	O_1	X	O_2
Control	O_1	-	O_2

2.2 Participants

The research participants at a high school in Banda Aceh's region for the 2021–2022 academic year are 162 individuals split over 5 classrooms, consisting of 30 students from the experimental class and 30 from the control class. Sampling was done by simple random sampling technique.

Additionally, natural science three 11th serves as the experimental class, and five 11th serves as the control class when choosing samples from the five classes. This sample's characteristics and traits were chosen from populations with a similar variance and a normal distribution. Natural science three 11th and five 11th originate from populations with the same variance.

2.3 Data Collection Tools

Lesson Plan

A scientific design method is used to create the RPP creating process per the 2013 curriculum requirements, followed by the CEP approach's phases via the PjBL learning model.

Student Worksheets

LKPD is a tool for learning that researchers use to provide guidelines or instructional materials for students working on projects. The completed version of the disseminated LKPD is made available to students. Prior to LKPD being adopted in classrooms, content experts must first undergo validation.

Learning Motivation and Soft Skills Questionnaire

This questionnaire was created to evaluate soft skills and learning motivation in line with the questionnaire responses. Questionnaires on learning motivation and soft skills may be known before and after adopting CEP-PjBL in the experimental class and standard teaching in the control class. The learning motivation questionnaire is made up of 42 statement items and ten indicators that were taken from Hamalik (2011). The soft skill questionnaire comprises eight indicators and 48 statement items from Sumarti & Sudarmin (2015).

The pre-test and post-test questionnaires that have been made will then be validated by two validators who aim to find out the validity or invalidity of the questionnaire used. The instrument is validated by expert chemical evaluation and education experts and tested on learners. The trial results are calculated r value and compared with the established criteria (Azwar, 2010). After being validated, pre-test and post-test trials will be conducted at school. It aims to find out the pre-test and post-test to measure learning motivation and soft skills in experimental and control classes.

Research Design

The research process is broken down into three major stages: research preparation, research implementation, data analysis, and conclusion. The initial stage is Research planning, including creating teaching resources and research tools. The second step is putting the study into practice, which includes pre-tests of students' learning motivation and soft skills before CEP-PjBL application, CEP-PjBL application, and post-tests of students' learning motivation and soft skills following CEP-PjBL learning. The third stage is to give conclusions based on the data analysis outcomes.

3. RESULT AND DISCUSSION

3.1 Instrument Validation Process and Results

Experts assessed the study's tools to ensure their validity and suitability. Valid tools show that research, data retrieval, and analysis techniques may be represented accurately (Leung, 2015).

Two professionals verified the RPP used in this investigation. The RPP validation sheet includes language correctness, material coverage, learning techniques, learning resources, learning activities, and identification evaluation and indications that adhere to learning objectives. Based on the validation findings that were acquired, a very valid category had an average score of 1.73 in the validation results.

In this study, LKPD was validated by two experts using an assessment sheet that included three questions for intrinsic cognitive load, external cognitive stress, and typographic load. Based on the validation results, the assessment results show an average score of 1.8, with a very valid category.

Pre-test and post-test assessment questionnaires that evaluate student learning motivation and soft skills are research instruments in the form of non-test instruments that two validators have verified. To ensure that the non-test instruments employed are reliable and appropriate for usage, they are validated by two specialist experts. Aspects such as statement items, structure, and language are evaluated.

3.2 Student Activities in the Application of CEP-PjBL

Students in class XI at SMAN 5 Banda Aceh participated in a learning process where three 11th graders served as the experimental class and five 11th graders as the control class. While the control class uses traditional learning, the experimental class uses the CEP-PjBL technique to create products. The CEP-PjBL approach is applied using six PjBL model syntaxes, including starting with fundamental questions, planning the rules of project artistry, creating an activity schedule, monitoring the progress of the learner's project, evaluating the outcomes of their work, and evaluating their learning experiences (Suranti, Gunawan, Harjono & Ramdani, 2020).

Learners employ PjBL syntax in conjunction with the CEP method during the learning process to boost learning motivation and soft skills in students. According to the CEP method using the PjBL model, the learning model's applicability in this study includes practically relevant material from the RPP and LKPD. The teacher will offer projects for the students to complete based on acid and base materials, namely preparing jelly candies from papaya leaves and orange peels. Students are given the chance to inquire about the assignments they are working on and attempt to connect the material to group projects that the students are working on. The students will gather tools after the information has been obtained.

3.3 Data Analysis of Student Learning Motivation

The markers of learning motivation created for this study were split into two categories: intrinsic and extrinsic. The necessity to learn chemistry, the desire to learn chemistry, interest in chemistry classes, and future goals that studying chemistry would help one achieve make up intrinsic motivation. According to Hamalik (2011), extrinsic motivation includes praise, the environment in the classroom, awards, constructive criticism, and parental expectations. Figure 1 displays the average pre-test and post-test scores given to students.

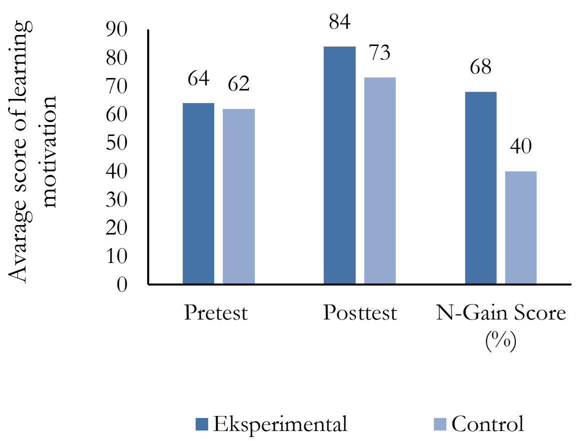

Figure 1 The average pretest-posttest results of learning motivation

Figure 1 shows the average learning motivation pre-test and post-test analysis results in the experimental and control classes. The results of the average value of learners' learning motivation at the pre-test in the experimental class of 64% and the control class of 62% did not differ markedly. That is due to the statistical homogeneity between the experimental and control classes at the time of sample selection before performing research. The results of the homogeneity and normality test indicated that the experimental and control classes had the same variance and were drawn from a population with a normal distribution. The findings of the sample statistical tests concluded that pupils in the experimental and control classes had similar average cognitive abilities.

Figure 2 displays the average of the pre-test and post-test findings of student learning motivation for each indicator in the experimental and control classes.

According to Figure 1's analysis of the average learning motivation of students in the experimental and control classes before and after adopting CEP-PjBL by generating a product, students in the experimental class had higher learning motivation than those in the control class. The average post-test scores of the students in the experimental class ranged from 77 to 91, indicating that the product produced by using the CEP approach via the PjBL model is more capable of increasing learning motivation than traditional learning, as evidenced by the control class's average post-test scores, which ranged from 61 to 71. That is consistent with the study's findings (Muntari, Purwoko, Savalas & Wildan, 2018).

The PjBL model's implementation of the CEP technique can boost students' motivation for learning on each metric. The desire to understand chemistry is the first sign. According to the first indicator of the experimental class's average student pretest-posttest results, which ranged from 65 to 90, the product's ability to increase

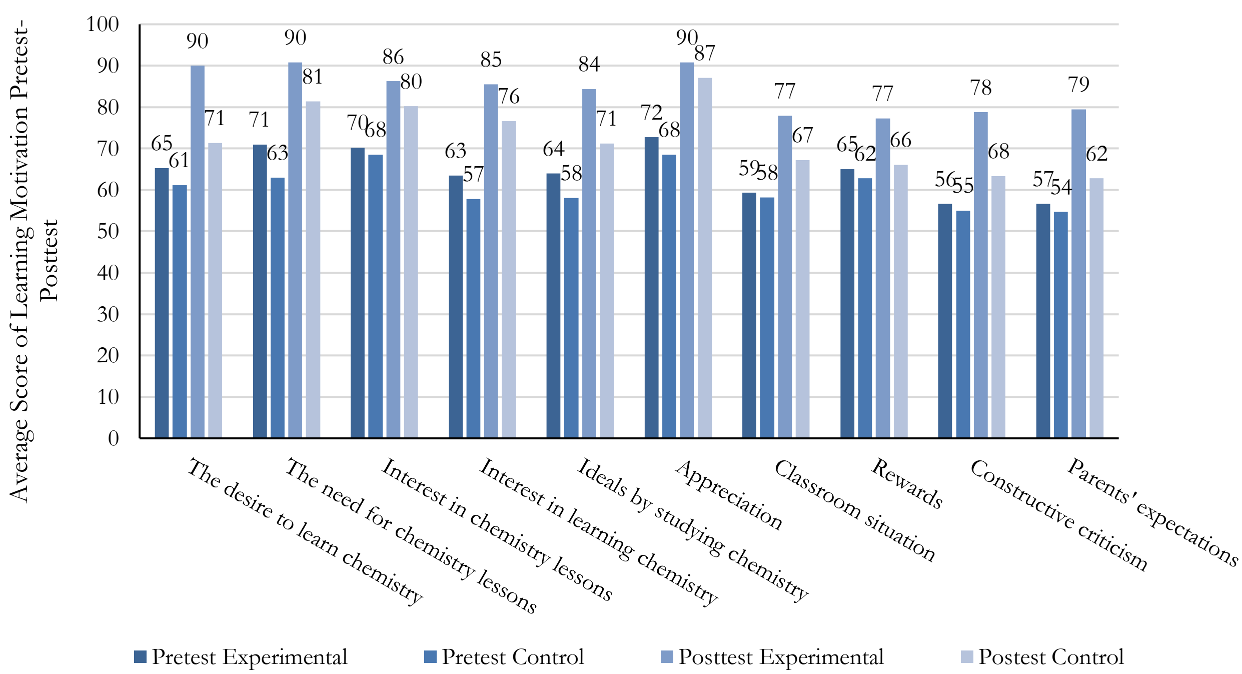

Figure 2 The average pretest-posttest results of learning motivation each indicators

students' desire for chemistry learning is superior to conventional instruction in the control class, where the average pretest-posttest result ranged from 61 to 71. This is because when CEP-PjBL is used in experimental classrooms, students are more motivated to study chemistry and are more likely to work together as a team. A desire to study chemistry develops (Rosita & Leonard, 2013).

The requirement for chemical instruction is the second indicator. The average result of the pretest-posttest indicator for the second control class was a score of 63-81, whereas the second indicator for the experimental class displayed the average result of the pretest-posttest with a score of 71-90. The CEP-PjBL technique may be used to comprehend that chemistry lessons must be learned. Students recognize the need for more in-depth comprehension of chemistry lectures since they know that practically everything around them contains chemicals (Sumarni, Wardani, Sudarmin & Gupitasari, 2016).

Chemistry class interest is the third indication. The average pretest-posttest score for the third indication in the experimental class was 70-86, whereas the average result for the third indicator in the control class was a score of 68–80. That is consistent with Chasanah, Khoiri & Nuroso (2015), who discovered that using entrepreneurial PjBL may spark pupils' keen enthusiasm and curiosity in chemistry.

Chemistry-related interest is the fourth indication. The fourth indicator for the experimental class revealed the pretest-posttest average score of 63-85, whereas the fourth indicator for the control class obtained the average result of the pretest-posttest with a score of 57-76. Applying CEP-PjBL can increase students' enthusiasm for studying chemistry. Students' enthusiasm for studying chemistry classes is greatly influenced by the use of methods of learning based on entrepreneurial projects. One of the key factors in promoting learning success is interest since it will help pupils recall positive experiences. The learning content will be simple to forget when pupils lose interest in studying (Wahida, Rahman & Gongo, 2016).

The fifth sign is my future aspiration to study chemistry. The experimental class's fifth indicator's pretest-posttest average score ranged from 68 to 84, whereas the average result for the fifth indicator in the control class was 57–81. The use of CEP-PjBL may impact students' goals for studying chemistry. According to research by Hemayanti, Muderawan & Selamat (2020), class XI students are urged to show a strong interest in learning chemistry subjects through PjBL because they want to work in chemistry-related fields, such as medicine, pharmacy, agriculture, etc. When students comprehend how chemistry is used, they can accomplish their objectives.

Admiration is the sixth indication. The sixth sign revealed the average pretest-posttest score for the experimental class, which ranged from 72 to 91. The sixth indication for the control group showed the average pretest-posttest score of 68-87. According to studies, instructors should always express appreciation to students, whether one-on-one or in groups, says Tuna (2022). The incentive may motivate students to become more involved in their studies.

The tone of the classroom is the eighth indication. The experimental class had an average score of 59-77 on the seventh indicator pretest-posttest, whereas the average result for the control class was a score of 58–67. PjBL models can help in the cognitive growth of students affected by various factors, one of which can foster a joyful learning environment in the classroom so that students will enjoy the learning process (Daryanto, 2014). One benefit of the PjBL approach, according to Novianto, Masykuri & Sukarmin (2018), is that it may produce a dynamic and enjoyable learning environment.

Reward is the eighth indication. Comparatively to the control class, where the eighth indication pretest-posttest's average score ranged from 62 to 66, the experimental class' eighth indicator displayed the average result of the pretest-posttest with a score of 65-77. The method for teaching compliance and incentives. Students won't commit errors to avoid prizes or penalties. In CEP-PjBL learning, the goal of the reward is to encourage students to make good academic progress (Hazra & Mittal, 2018).

Constructive criticism is the ninth indication. The average pretest-posttest score for the ninth indication in the experimental class was 56-78, whereas the average pretest-posttest score for the ninth indicator in the control class was 55-63. Students who use CEP-PjBL will develop attitudes and sentiments associated with learning, including the openness and freedom to accept constructive criticism to improve (Slameto, 2003; Lukita & Sudibjo, 2021).

Parental expectations are the eleventh indication. The average result of the pretest-posttest indicator 10 for the experimental class was 56-79, whereas the average result for the pretest-posttest indicator 10 for the control class was 54-62. Parents want their children to succeed after learning chemistry, and they also want them to have high grades in chemistry. These obligations must be supplemented by parental responsibilities that include providing guidance, counsel, the necessary resources, and other support to fulfill parental expectations (Hemayanti, Muderawan & Selamat, 2020).

Utilizing an independent sample t-test with a significance value of 0.05, the hypothesis testing to determine an increase in learning motivation was examined. It is necessary first to determine if the data is regularly distributed before testing the hypothesis. Tables 2, 3, and 4 display the findings of the pre-test and post-test data's normality, homogeneity, and t-test results.

Table 2 Normality pretest-posttest learning motivation test results

Score	Group	df	Sig.	Description
Pretest	Experimental	30	0.060	Normal Distributed
	Control	30	0.107	Normal Distributed
Posttest	Experimental	30	0.068	Normal Distributed
	Control	30	0.131	Normal Distributed

Table 3 Homogenity pretest-posttest learning motivation test results

Score	Group	Sig.	Description
Pretest	Experimental Control	0.788	Homogenity
Posttest	Experimental Control	0.461	Homogenity

Table 4 Results of independent sample t-test analysis of learning motivation

Score	Group	Sig. (*2-tailed*)	Description
Pretest	Experimental Control	0.888	No real difference
Posttest	Experimental Control	0.000	Real difference

3.4 Data Analysis of Students' Soft Skills

The tool used in this study to assess students' soft skills is a modified version of a Sumarti & Sudarmin (2015) questionnaire that includes questions about students' self-assurance, integrity, self-control, cooperation, communication skills, responsibility, creativity, and innovation. Students fill out surveys both before and after therapy. Figure 3 displays students' pre-test and post-test scores, and Figure 4 shows each indicator's average soft skill score.

Figure 4 depicts an evaluation of the average soft skills of students in the experimental class before and after utilizing CEP-PjBL to create a product, revealing that the students' soft skills are stronger than those in the control class. The average post-test scores of students in the experimental class ranged from 77 to 84, indicating that the application of the CEP approach through the PjBL model results in a product that can improve students' soft skills more effectively than traditional learning, with the control class's average post-test scores ranging from 61 to 74. This is in line with study findings by Windaniati (2015), who discovered that using a variety of learning models can, on average, boost favorable outcomes.

Soft skill evaluations of the students are done both before and after the CEP-PjBL learning program. Eight soft skill indicators for the CEP learning process via PjBL are evaluated on students using questionnaires. Per the evaluation criteria in the appendix, each indicator's maximum and lowest values are 4 and 1, respectively. Figure 2 displays the proportion of soft skill evaluations conducted before and after learning.

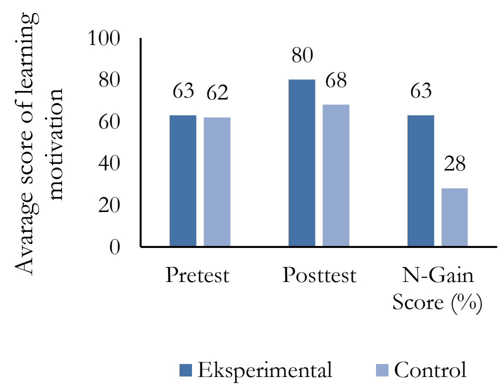

Figure 3 The average pretest-posttest results of soft skills

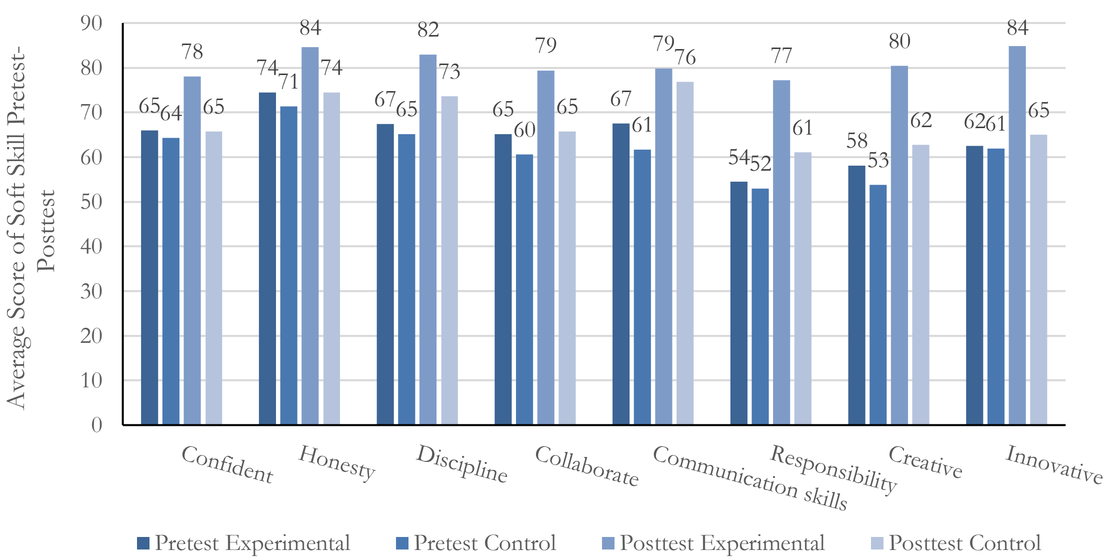

Figure 4 The average pretest-posttest results of soft skills each indicators

The PjBL model, when used to apply the CEP method, may help students develop their soft skills on each indication. Self-confidence is the first sign. According to the first indicator of the experimental class's average student pretest-posttest results, which ranged from 65 to 78, the product's ability to boost students' confidence is superior to that of conventional learning in the control class, where the average pretest-posttest result ranged from 64 to 65. Self-confidence is the most crucial ability that students need to possess to feel more confident in their talents while presenting both individual and group activities (Suwito, 2012).

Honesty is the second sign. According to Robles (2012), honesty is the capacity of pupils to act morally upright, with high morals, and with favorable personality attributes. The second indicator's average pretest-posttest score for the experimental class was 74-84, whereas the second indicator's average pretest-posttest score for the control class was 71-74. That is because every student in the experimental class exhibits high enthusiasm during the learning process. Suwito (2012) claims that this quality encompasses the values of righteousness, faith, honesty, compassion, ethics, and good manners.

Discipline is the third sign. A disciplined person would be able to work correctly and precisely while adhering to the regulations. The average pretest-posttest result for the third indicator in the experimental class was 67-82, whereas the average pretest-posttest result for the third indicator in the control class was 65-73. That is evident by the organized, capable, and well-behaved behavior of the experiment class's students. Teaching and learning activities can help students enhance their interpersonal intelligence, especially regarding discipline (Agustini, Awang & Parida, 2019).

Cooperation is the fourth indicator. According to Robles (2012), cooperation is the capacity of pupils to cooperate, be with others, agree, encourage, help, and collaborate. The experimental class's average pretest-posttest score for the fourth indicator was 65-79, while the control class's average pretest-posttest score was 60-65. This demonstrates a reasonably high excitement and cooperation among all experimental class participants as they work together to solve a specific challenge. One of the soft skills that helps pupils grow emotionally and improve their creativity is cooperation among classmates (Herborn, Stadler & Mustafic, 2020; Ngang, Yunus & Hasyim, 2015; (Swiecki, Ruis, Farrell & Shaffer, 2019).

The capacity for communication is the fifth indication. The best way to conduct learning is to communicate, which involves speaking, writing, presenting, and listening intently (Robles, 2012). The average pretest-posttest result for the fifth indicator in the experimental class was 67-79, whereas the average pretest-posttest result for the fifth indicator in the control class was 61-76. This indicates that learners at all levels can interact effectively when applying what they have learned. Rasyid (2016) made a similar claim and demonstrated that applying the CEP-PjBL learning model had a 73% negative impact on the soft skills of communication in the intermediate category.

Responsibility is the sixth indicator. According to Robles (2012), responsibility is the capacity of pupils to work with a feeling of responsibility, reliability, ability to complete tasks, resourcefulness, personal performance, conscientiousness, and thinking clearly. The average pretest-posttest score for the sixth indication in the experimental class was 54-77, whereas the average pretest-posttest score for the sixth indicator in the control class was 52-61. This is so that all students understand their excellent obligation in this area. Each pupil completes the duties assigned by the teacher with great efficiency (Robles, 2012).

Creativeness is the eighth indicator. Creative students can come up with original ideas (Robles, 2012). This metric reveals that learners possess strong talents. The average result of the seventh indicator pretest-posttest for the experimental class was 58–80, whereas the average result of the seventh indicator pretest-posttest for the control class was 53–62. Due to their ability to immediately put new knowledge into practice, students are quite satisfied with how it is applied to their lives.

The eighth metric focuses on innovation. Student innovation refers to their capacity to put novel concepts into practice (Robles, 2012). The average result of the eighth indicator pretest-posttest for the experimental class was 62-84, whereas the average result for the control class was 61-65. This demonstrates that students are satisfied with how CEP learning is used in the PjBL mode. According to a study by Windaniati (2015), students' positive talents might be increased on average by using various learning models.

Overall, the percentage of students' soft skills is categorized as having strong qualities, or 81.50%. This demonstrates that students' total soft skills are quite strong, and they are expected to continue to cultivate these talents. A person's career is greatly influenced by their soft skills, such as their capacity for social interaction. Companies that hire recent graduates place a high value on this competence. The findings of Seetha's (2014) study revealed that the greatest levels of soft skill qualities were cooperation ability (17%), excellent behavior (24%), and communication skills (28%). Teachers must use more effective teaching techniques to prepare students for their future careers better and meet demand while in the field (Hazra & Mittal, 2018).

The application of the CEP approach through the PjBL model can create a constructivist learning environment that actively engages students in learning activities to improve

Table 5 Normality pretest-posttest soft skills test results

Score	Group	df	Sig.	Description
Pretest	Experimental	30	0.279	Normal distributed
	Control	30	0.872	Normal distributed
Posttest	Experimental	30	0.121	Normal distributed
	Control	30	0.133	Normal distributed

Table 6 Homogenity pretest-posttest soft skills test results

Score	Group	Sig.	Description
Pretest	Experimental Control	0.501	Homogenity
Posttest	Experimental Control	0.152	Homogenity

Table 7 Results of independent sample t-test analysis of soft skills

Score	Group	Sig. (*2-tailed*)	Description
Pretest	Experimental Control	0.061	No real difference
Posttest	Experimental Control	0.000	Real difference

the mindset of students in problem-solving with different points of view, understanding concepts, being able to connect chosen information related to acid-base material in real life, and being able to produce innovations, according to the percentage of soft skill indicators. Consequently, using the findings of each soft skill indicator in conjunction with the PjBL model and the CEP method can be an option for helping students build their soft skills. Students use CEP-based LKPD during the learning process, which directs them to seek knowledge and perform experiments like making sweets from papaya leaves and orange peels.

An independent sample t-test with a significance value of 0.05 was used to assess hypothesis testing to determine whether soft skill development had occurred. It is necessary first to determine if the data is regularly distributed before testing the hypothesis. Table 5, 6, and 7 displays the findings of the pre-test and post-test data's normality, homogeneity, and t-test result..

4. CONCLUSION

The application of the CEP learning approach through the PjBL model results in different student learning motivations between the classes taught using the CEP through the PjBL model and classes taught conventionally, according to the research findings. Between classes taught using the CEP through the PjBL model and classes that are conventionally taught, there are variations in the students' soft skills as a result of using the CEP learning strategy through the PjBL model. When the CEP learning strategy is used through the PjBL model, there is a difference in the positive importance of students' learning motivation and soft skills before and after treatment. Learning motivation and student soft skills are related when the CEP learning technique is used through the PjBL model.

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