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TASK-CENTERED INSTRUCTION WITH HARD AND SOFT SCAFFOLDING TO EMPOWER ACADEMIC SELF-EFFICACY AND CREATIVITY

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Abstract

This study aims to empower students' academic confidence and creativity through task-centered instruction. The research method used is ADDIE with a pre-experimental design (posttest-only design). The research subjects involved were 26 fourth-grade elementary school students in Blitar City. The instruments used were a questionnaire to measure academic self-efficacy, which had been developed from previous research, and a rubric for assessing student creativity. The data were analyzed descriptively and quantitatively and classified into five categories (excellent, good, fair, poor, and very poor). The results of the data analysis showed that the students' academic confidence was, on average, in the good category. Student creativity tended to vary from very good, good, fair, and poor. Classically, student creativity was quite good. This study shows that guidance needs to be provided appropriately to support student learning progress, especially to support confidence, so that students are motivated to learn. The results of this study still need to be followed up by researching a larger sample and using an experimental method by comparing the experimental class and the control class. Then, the relationship between academic self-efficacy and the level of student creativity and how it affects learning outcomes needs to be studied.

Keywords

Academic Self-Efficacy, Creativity, Hard Scaffolding, Soft Scaffolding, Task-Centered Instruction.

INTRODUCTION

21st-century skills require students to master critical thinking, creativity, collaboration, and communication skills. Students need to be accustomed to analyzing, interpreting, making accurate decisions, solving problems, and reasoning in order to think critically. Effective communication skills are essential for students' future careers (Geisinger, 2016). Collaborative skills are demonstrated by the ability to work effectively, mutual respect, flexibility, and willingness to help achieve common goals, equality, and appreciation of contributions (Gibson & Chesterman, 2022). Creative and innovative abilities are characterized by the ability to explore creative ideas, be open to other people's views, and apply innovations according to the needs in the field (Tijsma et al., 2020).

21st century skills are closely related to the Pancasila Student Profile, which includes being faithful, devoted to God Almighty, and having noble character, being independent, critical thinkers, creative, cooperative, and globally diverse. Efforts to strengthen these skills are carried out through projects that are not integrated with school subjects or are carried out thematically. However, one elementary school encountered the problem that the time allocated for projects at school was not sufficient, so students had to complete them at home. As a result, the projects that students initially worked on at school became very different from those they had worked on at school.

Self-efficacy in learning is very necessary for elementary school students. This is because self-efficacy determines that a student plays an active role in learning. First, during the preliminary activity, students can respond to the stimulus given by the teacher, regardless of whether the student's response or answer is correct or not (Nafea, 2022). Second, throughout the learning process, students remain actively engaged and can further maintain motivation when facing more complex learning tasks or challenges (Shi et al., 2025). Third, confidence in learning can encourage students to think or empower high-level thinking skills, show actions and creative thinking skills, and be able to convey information to their peers and accompanying teachers straightforwardly. Finally, student confidence also affects the achievement of learning achievement (Zhang et al., 2025).

When the observation of planning for completing the task of making a transportation mockup at school, the students' ideas or ideas have not fully developed, and they still imitate many examples of products on YouTube. The process of completing assignments at school also tends to be long, so that mock-up assignments must be completed at home. When peer assessments also show that each student does more assignments in the finalization process, such as coloring and

decorating. In addition, there is a striking difference in design when the task is done at school and at home. Based on interviews with students, there is still a lot of interference from parents in the projects they work on. Referring to the above problem, it can be seen that students still lack confidence in creating their own work, so they tend to depend on others. This affects students' creativity in producing original and new ideas. Akter (2021) explains that self-confidence determines a person's willingness to learn. Self-efficacy determines student learning performance, learning management strategies, and student academic achievement.

A confident person believes that they have the skills and ability to act effectively to achieve specific goals (Puozzo & Audrin, 2021). Academic self-efficacy refers to students' belief in their ability to achieve learning objectives (Dogham et al., 2022; Ulfert-Blank & Schmidt, 2022). Low academic self-confidence tends to cause stress and limit the ability to create solutions to problems (Zhu et al., 2017). Challenging academic tasks can only be overcome by students who have academic confidence and high resilience (Ayala & Manzano, 2018). Thus, there is a close relationship between academic self-confidence and student performance levels (Schuldberg & Guisinger, 2021). Someone who believes in their own creativity will be able to produce new things, perform, or complete tasks in creative ways (Beghetto & Karwowski, 2017; Tierney & Farmer, 2017).

According to information processing theory, individuals must understand task demands, self-capacity, and strategies for completing tasks, which is referred to as self-regulation. Self-regulation is related to motivation and control of learning progress. Motivation drives the activation of goal-achievement strategies (Corebima, 2017). This motivation encompasses all phases, namely self-confidence, performance control, and self-reflection (Dent & Koenka, 2016). Students who possess self-regulation skills view themselves as competent to complete tasks and achieve goals. Thus, self-regulation and motivation influence each other (Vrieling et al., 2017).

In research conducted by Musengimana et al. (2022), Task-based learning improves positive perceptions of chemistry learning, but this effect is inconsistent among male and female students, so teachers need to use different techniques to motivate students. This inconsistency is evident in the low perception of the usefulness of chemistry lessons for future careers. In the context of English lessons, task-based learning has been proven to increase students' confidence in reading. However, it is still necessary to strengthen classroom support to create interaction between students and social feedback (Wordofa et al., 2025). The assignment design also has a significant impact on student anxiety, particularly in terms of communication, so teachers need to provide emotional

encouragement and media assistance (Wang et al., 2025). Thus, task-based learning still needs to be reinforced by learning support methods.

Guidance can now be provided through technology. This guidance helps students reflect on their learning and encourages them to improve their performance (Menekse et al., 2025). Mentoring also encourages students to think more creatively (Jin et al., 2024). Flexibility in thinking, learning achievement, and student motivation can be strengthened through technology-facilitated mentoring (Yu, 2024; Yu et al., 2025). Guidance in small group discussions has also been proven to be effective in mathematics learning (Calor et al., 2024).

Considering the limitations of task-based learning models in terms of scaffolding fulfillment and considering the positive impact of scaffolding in learning design, further research is needed in relation to the demands and learning needs of students today. It is important to develop students' academic confidence in learning, which is expected to contribute to academic achievement, one of which is creativity. Thus, this study attempts to develop a task-based learning model by integrating hard scaffolding (guidance facilitated through storybooks and student worksheets) and soft scaffolding (guidance provided through feedback, opportunities to ask questions, and reflection).

One factor that supports students in their self-directed learning skills is the provision of guidance (Gorbunovs et al., 2016). Guidance is needed when students encounter unfamiliar problems. Guidance is effective when teachers know the level of their students' abilities (Hsu et al., 2017). Guidance can take the form of hard and soft scaffolding (Broadbent et al., 2020). Hard scaffolding helps students in cognitive processing through visualization, such as concept maps (Li et al., 2025) . Soft scaffolding is provided by teachers as facilitators by creating social systems, questioning strategies, elaborating thoughts and connecting them, and encouraging students to identify difficulties or misconceptions. Training and modeling can also be done by teachers and peers to encourage problem-solving (Ruggiero & Green, 2017).

Student self-efficacy, intrinsic motivation, self-regulated learning abilities, and creativity can be developed through student-centered learning (Reigeluth et al., 2017), for example, problem-based learning. However, in order to balance the resolution of real problems around students with the level of effective guidance, it was decided to implement task-centered instruction (TCI). Complex tasks encourage students to explore new ideas and apply their competencies. The TCI learning model is thought to be effective in learning that requires students to complete tasks within a certain period of time while still considering the clarity of the learning structure and guidance, and, above

all, avoiding the frustration that occurs in pure problem-based learning (Meng et al., 2016). Thus, this study was conducted to develop a Task-Centered Instruction model with Hard and Soft Scaffolding to empower elementary school students' academic self-efficacy and creativity.

METHOD

This study is a research and development (R and D) study using the ADDIE method. The data collection method during the needs and problem analysis stage was through observation of learning at the Laboratory Elementary School, State University of Malang. The next design stage was carried out based on the problems found. At this stage, a learning model was designed, complete with five components, namely syntax, social principles, reaction systems, support systems, and instructional and accompanying impacts. This design was specifically developed from the learning model framework (Joyce et al., 2016) and Phase C Learning Achievement documents for grade 5.

During the development stage, the designed model was validated by learning experts, including modules, storybooks, student worksheets, questionnaires, and creativity assessment rubrics. The validation process used a 1-5 Likert scale. Specifically for the academic self-confidence questionnaire, the researchers adapted it from previous research of Schmitz & Rowbotham (2013). The questionnaire consisted of 10 statements with a rating scale of 1-10. The teaching materials, which had been validated by experts, were then tested on five fifth-grade elementary school students at the Laboratory School of State University of Malang to obtain suggestions and feedback from teachers and students.

The fourth stage was implementation. The learning model that had been developed with its five components was then tested on 26 elementary school students at the UM Laboratory to determine whether the model could empower students' academic confidence and creativity. The sampling technique used was purposive sampling. The testing used a pre-experiment (without a control group) with a post-test only design because academic confidence was assessed at the end of the learning process, and creativity was also assessed during the third meeting when students developed products to support natural resource conservation. Data collection techniques used academic confidence questionnaires and observations using student creativity assessment rubrics. The data on students' academic confidence and creativity were analyzed descriptively and quantitatively using five categories according to Widoyoko (2017) namely excellent, good, fair, poor, and very poor. The final stage is to evaluate all stages of research and development to ensure that

the research has answered the problems and examined the limitations found for further follow-up or improvement.

FINDINGS AND DISCUSSION

Findings

In the needs analysis stage, the researcher used learning observation techniques while students were learning to complete tasks to produce problem-solving products, specifically in ecosystem learning. The observation results showed that students were not yet skilled at developing ideas independently, as evidenced by the fact that the tasks planned to be done and completed at school still had to be completed at home.

Based on the results of the needs analysis, students still need gradual support in order to complete complex tasks. The design stage is based on the Learning Outcomes in phase B, namely that students can identify problems related to the conservation of natural resources in their environment and their connection to efforts to preserve living things. Based on these learning outcomes, the following learning objectives were formulated: students can distinguish between renewable and non-renewable natural resources; students can identify the use of fossil fuels; students can identify substitutes for fossil fuels; students can analyze the impact of pollution; students can analyze efforts to prevent pollution; and students can explain strategies for conserving natural resources. These learning objectives serve as a reference for developing a digital book entitled The Mystery of the Sandalwood Forest: Science Adventure Storybook and Student Worksheets as a form of hard scaffolding in the task-centered instruction model. In addition, the academic self-efficacy assessment questionnaire was adapted from an instrument developed by Schmitz & Rowbotham (2013). The questionnaire consists of 10 statements with a rating scale of 1-10. The academic self-efficacy instrument has met the validity aspect with a calculated r > table r, and its significance for all statements is less than 0.05. In addition, the instrument has also met the reliability aspect with a Cronbach's Alpha value of 0.875 (greater than 0.6). Creativity is assessed using a rubric for assessing student creativity in natural resource conservation. The rubric consists of assessment components for material selection, product design, product manufacturing process, and product creativity, with a Likert scale of 1-4.

During the development stage, the designed teaching materials were validated by two experts in science subject matter and learning. In the picture storybook shown in Figure 1, there were several inputs, namely 1) checking for typos, 2) adding leading and guiding questions for students to think more critically, 3) adding material in the form of text and images in between the adventure stories, 4) improving the storyline by combining problems and conceptual understanding in accordance with the sequence of concepts, 5) removing text or images that did not support the learning objectives.

Figure 1. Design of the Mystery of the Sandalwood Forest: Science Adventure Storybook

Hard Scaffolding is also presented in the form of student worksheets with tasks ranging from simple to complex, namely analyzing renewable and non-renewable natural resources, analyzing the impact of natural resource utilization, and developing products for natural resource conservation. The guidance provided takes various forms, such as problem stimuli, simple experiments to prove answers, and questions to reinforce understanding, as shown in Figure 2.

Tugas Belajar 1

APA YANG TERJADI JIKA TANAH LAPISAN ATAS TIDAK TERLINDUNGI?

Tanaman tumbuh di bumi lapisan atas yang kaya akan unsur hara, yang disebut tanah lapisan atas. Tanaman membantu menjaga tanah lapisan atas tetap di tempatnya dengan melindunginya dari angin dan hujan. Lakukan percobaan berikut ini untuk mengetahui apa yang terjadi ketika tanah lapisan atas tidak terlindungi!

1. Gunakan **campuran pasir lembab dan tanah pot** untuk membuat miniatur daratan dalam **baskom plastik atau loyang aluminium-foil**. Bentuklah bukit dan lembah.
2. Gunakan **sekumpulan lumut** sebagai tanaman untuk menutupi sebagian area bukit dan lembah. Sisakan beberapa bagian yang miring tanpa tutupan tanaman.
3. Simulasikan hujan badai di atas bukit dengan menyemprotkan **air** ke atasnya dari **botol semprotan** atau dengan menuangkan **aliran air** secara perlahan ke atasnya **dari gelas**.
4. Catat hasil pengamatanmu mengikuti pertanyaan di bawah ini dan jelaskan apa yang terjadi pada lahan yang tidak terlindungi oleh tutupan tanaman. Komunikasikan hasilnya di depan kelas saat pembelajaran.

Bagaimanakah kondisi lahan yang tidak tertutup tanaman sebelum terjadi hujan badai?

Bagaimakah kondisi lahan yang tidak tertutup oleh tanaman setelah terjadi hujan badai?

Prediksikan hasil pengamtanmu jika terjadi dalam kehidupan nyata

Figure 2. Example Assignment for Meeting 1: Maintaining Ecosystem Balance

The Soft Scaffolding approach was implemented by providing opportunities for students to ask questions in small groups, facilitating small group discussions, and strengthening the social system between teachers and students and among students themselves.

The implementation stage used a pre-experimental design with a post-test only design and consisted of 26 fifth-grade students from a laboratory elementary school. The results of the assessment of students' academic self-efficacy and creativity were analyzed descriptively and quantitatively using score conversion according to Widoyoko (2017).

The following is a learning concept using the Task-Centered Instruction model with Hard and Soft Scaffolding to empower students' academic self-efficacy and creativity.

Table 1. Task-Centered Instruction with Hard and Soft Scaffolding

Syntax	Social System	Principles of Reaction	Support System	Instructional Impact	Accompanying Effects
Learning task	Students in groups discuss to complete assignments and answer questions.	Teachers present assignments with a gradual level of complexity	Problem stimuli on student worksheets and provision of tools, materials, and procedures for problem solving	Students can identify issues related to natural resource conservation in their surrounding environment Students can develop efforts to preserve living things.	Students may have perceptions of academic capability. Students are actively involved in learning.
Activation of prior knowledge	Students in groups share their initial knowledge on the topic, choose whether they agree or disagree with the given statements, and work together to prove the correctness of their answers.	Teachers give students the opportunity to seek the truth behind the answers that have been given.	The Mystery of the Sandalwood Forest: Science Adventure Storybook and Student Worksheets		Students are able to devise strategies to complete tasks. Students have independence in completing tasks
Demonstration/modelling	Students and their groups check the suitability of the tasks they have completed from the teacher's demonstration.	The teacher demonstrates how to complete the task and answers questions. The depth of this guidance	Tools and materials, procedural information, and supporting information in the Mystery of		

Syntax	Social System	Principles of Reaction	Support System	Instructional Impact	Accompanying Effects
		decreases as students' understanding and skills improve	the Sandalwood Forest: Science Adventure Storybook to demonstrate tasks and evidence and answer questions.		
Application	Students work in groups to answer follow-up questions on the assignment they have completed.	Teachers provide feedback on students' task completion as a form of soft scaffolding.	Hard Scaffolding through follow-up questions on student worksheets		
Integration	Students and their study groups summarize the concepts they have learned and relate them to everyday contexts.	Teachers reinforce students' understanding as a form of soft scaffolding.	Hard Scaffolding through follow-up questions on student worksheets		

Source: Researcher Development

Based on the implementation of the Task-Centered Instruction model using Hard and Soft Scaffolding, the following research results were obtained. Students' academic self-efficacy after participating in three learning sessions was good on average for nine statements and very good for one statement, as shown in Table 2 below.

Table 2. Results of Student Academic Self-Efficacy Assessment

Statements	Average	Category
I am confident that I can successfully learn all the concepts in science, even though it is difficult.	7.31	Good
I can still maintain a positive attitude toward learning science even when tension suddenly arises.	7.00	Good
When I try hard, I can learn even the most difficult material.	8.08	Good
I am sure that the longer I study science, the more my abilities will improve.	8.08	Good
I am confident that I can continue to study well even though I get distracted in class.	7,81	Good
I am sure I can still study well even though I am having a bad day.	6.81	Good
If I try hard enough, I can achieve my desired learning goals.	8.42	Very Good
I am confident that I can develop creative ways to cope with stress	7.62	Good

that may arise while studying science.		
I know that I can still be motivated to participate in science learning.	7.08	Good
I know that I can complete the assigned project and get the grade I want, even though others think I can't.	7.96	Good

In addition to assessing academic self-efficacy, this study also measured the empowerment of students' creativity in efforts to preserve natural resources. Table 3 below presents the results of the performance assessment using a student creativity assessment rubric. This assessment was conducted in groups. Group A chose materials from plastic bottle waste to make toy cars with complex car frames, group B chose the same materials but used them to make pencil holders, group C made jars from mineral water glasses with simple designs, group D made airplanes from plastic bottles, and group E only used plastic bottles to make vases with simple designs. These materials were chosen because the students themselves considered that there was a lot of plastic bottle waste in the school environment. The students understood that plastic waste pollution is a very serious problem. They also understood that these materials can be recycled into new items, reused as environmentally friendly bricks, and their use can be minimized by using cloth bags and refillable water bottles. Based on the analysis of each group, only one group's creativity was rated as excellent. When analyzed from each aspect of creativity assessment, the choice of materials was good, while the other three aspects were rated as adequate.

Table 3. Results of Student Creativity Performance Assessment

Groups	Component of Assessment				Average	Category
	Material Selection	Product Design	Manufacturing Process	Creativity of Product		
A	4	3	4	4	3.75	Very Good
B	3	3	3	2	2.75	Good Enough
C	2	2	2	2	2	Poor
D	4	4	3	3	3.25	Good
E	3	2	1	2	2	Porr
Average	3.2	2.8	2.6	2.6		
Category	Good	Good Enough	Good Enough	Good Enough		

Based on the results of the final product presentation and student reflections, students need to be given more time to develop group ideas and decide on one idea that is considered the most creative, and to design a more varied product. In the manufacturing process, one group's product was still very simple without any additional complementary materials, resulting in a very simple product. This was because the group's collaboration tended to be lacking, even though the teacher

had provided guidance and explained the product assessment criteria.

Discussion

Based on the research results, students' academic self-efficacy is generally good. When analyzed from the learning process, in meeting 1, all groups were quite good at completing tasks or problems about what would happen if the land was not protected by vegetation in relation to the phenomenon of illegal logging. This is evidenced by their firm decision on how to preserve natural resources in everyday life and their firm opinion that building structures on riverbanks is not the right decision because it can cause flooding and even pollution. The students' understanding is supported by evidence from simple experiments, follow-up questions, and reinforced by readings in the Mystery of the Sandalwood Forest: Science Adventure Storybook.

These observations are consistent with previous studies, namely that when students are faced with problems, guidance needs to be provided to them as long as they are unable to learn and understand on their own. Teacher guidance provided through simple experiments with easy-to-understand procedures helps develop problem-solving skills (Tawfik et al., 2018). This Task-Centered Instruction model helps students understand topics through problem-solving. Students also feel comfortable while learning because of the guidance provided through follow-up questions. Interesting picture books with storylines related to learning concepts make it easier for students to understand and solve problems. According to previous research, self-efficacy is a potential for a person to be more creative (Tierney & Farmer, 2017). Learning that can boost self-efficacy can also encourage students to be more creative and enthusiastic in their studies (Puozzo & Audrin, 2021).

When given problems, for example, in meeting two about the impact of natural resource utilization on economic activities and how to prevent damage, students tried to solve them by understanding the readings in the Mystery of the Sandalwood Forest: Science Adventure Storybook. Three of the five groups argued that the use of alternative energy could reduce the risk of environmental change. Learning stimuli in the form of problems can encourage students to be able to find alternative solutions, accept uncertainty, and prepare students to face and overcome current educational challenges and their future careers (Stolz et al., 2022). Hard scaffolding, as outlined in the student worksheet in the form of questions, proofs, and follow-up questions, can reduce cognitive pressure and increase student motivation. Furthermore, students feel confident that they can master even difficult material.

The Task-Centered Instruction model with Hard Scaffolding has created an active learning environment for students. The culmination of the task or problem in meeting 3 was to develop a product as an effort to conserve natural resources. Students were given the freedom to make decisions related to efforts to protect natural resources from pollution. In this task, all students focused on reusing plastic waste found in their school environment. Based on the knowledge they had acquired in sessions 1 and 2, students actively developed their creativity to turn waste into useful products. This is in line with previous research that an active learning environment supports students' confidence in generating creative ideas (Sahin-Taskin, 2017).

At each meeting and stage of learning, providing soft scaffolding greatly helps students reduce tension or difficulty in solving problems. Providing feedback and reinforcement by teachers while students complete tasks can reduce cognitive pressure on students so that they are confident that they can achieve learning objectives, complete learning challenges, and maintain a positive perception of learning. Students' cognitive load or academic fatigue has been studied as one of the factors that can affect students' academic self-efficacy (Akter, 2021). In addition, providing feedback by linking the efforts and strategies that students have implemented can boost their confidence and help them achieve success in their studies (Granberg et al., 2021). More than that, a person's self-efficacy determines their success and satisfaction in life (Hitches et al., 2022).

Scaffolding is provided while teachers interact with students in small discussion groups (Sun et al., 2022). During group problem solving, students are encouraged to read materials related to the task. This activity aims to enable students to connect their prior knowledge with the content that must be learned to help solve problems. The problems given by the teacher are part of the introduction to the concept and stimulate prior knowledge. The provision of reading materials and simple experiments serves as a tool to help students answer questions. Follow-up questions after students conduct experiments serve as a review that encourages students to strengthen their understanding and confidence in making decisions. This is supported by research explaining that scaffolding serves to maintain student perseverance and emotional stability (So et al., 2019).

CONCLUSION

Task-based learning with hard scaffolding provides assistance to elementary school students in solving problems through stages and amounts of guidance tailored to the students' abilities and needs. This guidance helps motivate students to learn, thereby boosting their confidence to

successfully solve even more difficult problems. Reviews, as a form of soft scaffolding provided by teachers to students at all stages of learning, reinforce students' decision-making abilities and improve their performance in problem-solving. Hard and soft scaffolding together empower students to be more confident in their academic abilities, encouraging them to feel comfortable in their learning. Thus, students are free to develop creative ideas to produce products as an effort to conserve natural resources.

This study can provide alternative strategies for simultaneous scaffolding. Its development can be adjusted to the level of task complexity and students' learning skills and independence. Monitoring during small group discussions to solve problems is very useful for determining the amount of scaffolding that needs to be provided in future learning periods. This research still needs to be applied on a wider scale by testing the correlation between students' academic self-efficacy and creativity and its influence on student learning outcomes. In addition, testing this model needs to use an experimental design to compare it with other learning models to prove its reliability.

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