Developing Skills in Designing Experiential Learning Activities in Mathematics Teaching for Primary Education Students at Tan Trao University, Tuyen Quang Province

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ABSTRACT:
The enhancement of educational practices through the integration of experiential learning activities in mathematics teaching is increasingly recognized as essential for fostering student engagement and comprehension. This study delves into the development of skills required for designing such experiential activities among primary education students at Tan Trao University in Tuyen Quang Province. By implementing a structured training program, this research aims to equip future educators with both the theoretical knowledge and practical skills necessary to create dynamic and interactive mathematics lessons.

The methodology encompasses a blend of qualitative and quantitative approaches to assess the effectiveness of the training program. Pre- and post-training evaluations, along with detailed observations and interviews, provide a comprehensive understanding of the improvements in the students’ abilities. The results demonstrate a marked enhancement in the competency of the students to design and execute experiential learning activities, reflecting a deeper understanding of pedagogical techniques and a more profound engagement with the subject matter.

The findings underscore the transformative potential of experiential learning in primary education, highlighting how such approaches can make abstract mathematical concepts more tangible and relatable for young learners. This study also addresses the challenges and obstacles encountered during the implementation of these activities, offering insights and recommendations for overcoming such barriers.

Furthermore, the research contributes to the broader discourse on educational innovation by illustrating the impact of well-designed experiential activities on student motivation and academic performance. It emphasizes the need for ongoing professional development and support for educators to continuously refine their teaching strategies in response to evolving educational demands.

This study not only reinforces the value of experiential learning in mathematics education but also provides a practical framework for developing and implementing these activities. By preparing primary education students at Tan Trao University with these essential skills, the research paves the way for a more interactive, engaging, and effective educational experience for future generations. This underscores the critical role of innovative teaching methodologies in nurturing the intellectual and personal growth of young learners, ultimately contributing to the advancement of primary education in Vietnam.

Keywords: Experiential Learning, Mathematics Teaching, Primary Education, Skill Development, Educational Innovation.
INTRODUCTION

In the rapidly evolving landscape of education, the traditional methods of teaching mathematics are increasingly being supplemented and, in some cases, replaced by innovative pedagogical approaches that prioritize active learning and student engagement. Among these approaches, experiential learning has emerged as a particularly effective strategy for enhancing the educational experience and fostering a deeper understanding of mathematical concepts. This study focuses on the crucial task of developing the skills required to design experiential learning activities among primary education students at Tan Trao University in Tuyen Quang Province.

Experiential learning, rooted in the principles of learning by doing, posits that students learn more effectively when they actively engage with the material, apply their knowledge in practical contexts, and reflect on their experiences. This approach aligns well with the teaching of mathematics, a subject often perceived as abstract and challenging by students. By incorporating experiential learning activities into the mathematics curriculum, educators can make mathematical concepts more tangible and accessible, thereby enhancing student comprehension and retention.

The importance of equipping future educators with the skills to design and implement experiential learning activities cannot be overstated. Teachers play a pivotal role in shaping the learning environment and influencing student outcomes. As such, their ability to create interactive and engaging lessons is critical. This study seeks to address this need by providing a comprehensive training program aimed at developing these essential skills among primary education students at Tan Trao University.

The training program is designed to offer both theoretical and practical components, ensuring that participants not only understand the underlying principles of experiential learning but also acquire the hands-on experience necessary to apply these principles effectively. Through a combination of workshops, collaborative projects, and real-world teaching practice, the program aims to build a robust foundation in experiential learning design.

This study employs a mixed-methods approach to evaluate the effectiveness of the training program. By integrating qualitative and quantitative research methods, the study provides a holistic view of the participants' progress and the impact of the training on their teaching competencies. Pre- and post-training assessments, along with continuous observations and in-depth interviews, are used to gather comprehensive data on the participants' development.

The findings of this study are expected to have significant implications for the field of primary education. By demonstrating the effectiveness of experiential learning activities in mathematics teaching, the study advocates for broader adoption of these methods in educational institutions. Furthermore, it highlights the importance of continuous professional development for educators, ensuring they remain equipped with the latest pedagogical strategies to meet the evolving demands of the educational landscape.

This study aims to contribute to the advancement of primary education by equipping future educators with the skills necessary to design and implement experiential learning activities in mathematics. By fostering a more interactive and engaging learning environment, these educators can help students develop a deeper understanding of mathematical concepts and a greater enthusiasm for learning. The ultimate goal is to enhance the quality of education and support the intellectual and personal growth of young learners in Vietnam.
Experiential Activities

Experiential activities, integral to the field of education, represent a transformative approach that enhances student engagement, comprehension, and retention of complex concepts. In the context of mathematics education, these activities hold particular promise due to the often abstract nature of mathematical theories and principles. For primary education students at Tan Trao University in Tuyen Quang Province, developing the skills to design and implement such activities is crucial for fostering a deeper understanding and appreciation of mathematics among young learners.

Experiential learning is grounded in the philosophy of learning by doing. This educational strategy emphasizes active participation, encouraging students to engage directly with the material, apply their knowledge in real-world contexts, and reflect on their experiences. This approach contrasts sharply with traditional didactic methods, which often rely on passive absorption of information. By involving students in hands-on, practical activities, experiential learning makes abstract mathematical concepts more tangible and accessible. According to [12], experiential learning involves a four-stage cycle: concrete experience, reflective observation, abstract conceptualization, and active experimentation. This cycle ensures that students can fully engage with and internalize new information.

One of the key components of experiential activities in mathematics education is hands-on learning. This involves using physical objects, manipulatives, and interactive tools to explore mathematical ideas. For example, students might use blocks to understand geometric shapes, measure items to grasp the concept of units and quantities, or employ interactive digital tools to visualize complex equations. These activities not only make learning more engaging but also help students develop a concrete understanding of abstract concepts. [13] emphasized that hands-on learning is critical for fostering deep understanding, as it allows learners to connect theoretical knowledge with practical experience.

Another crucial aspect is the application of mathematics to real-world scenarios. By demonstrating how mathematical principles are used in everyday life, educators can help students see the relevance and importance of what they are learning. Activities might include budgeting exercises, analyzing statistical data related to current events, or solving practical problems that require mathematical reasoning. This real-world application helps students connect their learning to their own experiences, making it more meaningful and memorable. [18] argue that learning is most effective when it is situated in authentic contexts, where students can see the direct application of their knowledge.

Collaborative projects are also a significant component of experiential learning. Working in groups on mathematical tasks not only helps students learn from each other but also fosters essential skills such as communication, cooperation, and teamwork. For instance, students might work together to design and build structures that require precise mathematical calculations, thereby applying their knowledge in a collaborative and supportive environment. [15] highlighted the importance of social interaction in learning, suggesting that collaborative projects can enhance cognitive development through shared problem-solving and dialogue.

Reflective practices are another cornerstone of experiential activities. After engaging in hands-on tasks, students are encouraged to reflect on their experiences, discuss what they have learned, and consider how they can apply this knowledge in the future. This reflection can take various forms, including group discussions, individual journals, or presentations. By reflecting on their learning process, students gain a deeper understanding of the material and become more aware of their own learning strategies. [19] introduced the concept of the reflective practitioner, emphasizing the role of reflection in professional practice and learning.

The integration of technology in experiential learning is also vital. Educational software, interactive simulations, and online resources provide dynamic and engaging ways for students to explore
mathematical concepts. Technology can offer immediate feedback, allowing students to experiment and learn from their mistakes in a low-stakes environment. It also enables personalized learning, where students can progress at their own pace and focus on areas where they need the most improvement. [20] advocated for the use of technology in education, arguing that it can transform traditional learning environments and empower students to take control of their own learning.

The benefits of experiential activities in mathematics education are manifold. They enhance students' understanding by making learning more interactive and engaging. Students are more likely to retain information when they are actively involved in their learning process. Additionally, these activities develop critical thinking and problem-solving skills, as students are often required to analyze situations, make decisions, and solve complex problems. Finally, by linking mathematical concepts to real-world applications, experiential learning prepares students to apply their knowledge in practical situations, thereby equipping them with the skills they need for future success.

In conclusion, experiential activities are a powerful tool in mathematics education, particularly for primary education students at Tan Trao University. By developing the skills to design and implement these activities, future educators can create a more engaging, interactive, and effective learning environment. This approach not only enhances students' understanding and appreciation of mathematics but also supports their overall intellectual and personal growth. Through this research, we aim to contribute to the advancement of primary education in Vietnam, fostering a new generation of educators who are equipped with the innovative teaching methodologies necessary to meet the evolving demands of the educational landscape.

Forms of Experiential Activities

Experiential activities, pivotal in contemporary educational practices, encompass a diverse array of forms designed to engage students actively and foster a deeper understanding of the subject matter. In the context of teaching mathematics to primary education students at Tan Trao University, the implementation of various forms of experiential activities is essential for enhancing learning outcomes and developing effective pedagogical strategies.

1. Hands-On Manipulatives

Hands-on manipulatives are one of the most fundamental forms of experiential activities. These involve the use of physical objects that students can touch, move, and manipulate to explore mathematical concepts. For example, geometric shapes made of plastic or wood can help students understand spatial relationships and properties of shapes. Similarly, using measuring tools like rulers and scales allows students to grasp concepts of length, weight, and volume more concretely. According to [14], concrete operations are essential for children as they help in developing logical thinking through direct interaction with physical objects.

2. Interactive Simulations and Digital Tools

With the advent of technology, interactive simulations and digital tools have become increasingly prevalent in experiential learning. Software programs and online platforms offer dynamic and interactive ways for students to visualize and experiment with mathematical concepts. For instance, geometry software allows students to draw and manipulate shapes, while algebraic tools help them understand equations and functions through visual representations. [19] argued that technology, such as computer-based learning environments, can create opportunities for students to engage in problem-solving and exploration that are both rich and meaningful.

3. Real-World Problem Solving

Real-world problem-solving activities bridge the gap between abstract mathematical theories and practical applications. These activities involve presenting students with real-life scenarios that require mathematical reasoning to resolve. Examples include budgeting for a class party, analyzing statistics from a sports game, or designing a simple structure using geometric principles. [17]
emphasized that situating learning in authentic contexts not only makes the material more relevant but also enhances students' ability to apply their knowledge in real-world situations.

4. Collaborative Learning Projects

Collaborative learning projects are another effective form of experiential activity. These projects encourage students to work together in groups, promoting cooperative learning and peer-to-peer interaction. For example, students might collaborate on designing and building a model of a bridge that requires precise mathematical calculations. This form of activity not only helps in reinforcing mathematical concepts but also fosters essential skills such as communication, teamwork, and problem-solving. [18] highlighted the importance of social interaction in cognitive development, suggesting that collaborative learning can significantly enhance students' learning experiences.

5. Reflection and Discussion

Reflection and discussion are integral components of experiential learning, allowing students to process and internalize their experiences. After participating in experiential activities, students engage in reflective practices, such as discussing their findings with peers, journaling about their learning experiences, or presenting their results to the class. [19] introduced the concept of reflective practice, asserting that reflection helps learners make sense of their experiences and integrate new knowledge with existing understanding.

6. Role-Playing and Simulation Games

Role-playing and simulation games provide immersive experiences that help students explore mathematical concepts in a simulated environment. For example, students might engage in a role-playing activity where they act as financial managers making investment decisions or participate in a simulation game that requires them to solve complex mathematical problems under time constraints. These activities not only make learning more engaging but also help students develop critical thinking and decision-making skills. [13] argued that such immersive experiences are crucial for fostering active learning and deep understanding.

7. Field Trips and External Experiences

Field trips and external experiences offer students the opportunity to connect classroom learning with real-world environments. Visits to local businesses, museums, or science centers can provide practical examples of how mathematics is used in various professions and industries. For instance, a trip to a manufacturing plant might illustrate the application of geometry and measurement in production processes. Such experiences enrich students' understanding by showing the relevance of mathematical concepts outside the classroom context.

8. Experimental Activities

Experimental activities involve conducting simple experiments or investigations to explore mathematical phenomena. For example, students might use simple tools to measure and record data, test mathematical hypotheses, or explore statistical concepts through hands-on experiments. These activities promote inquiry-based learning and encourage students to apply their mathematical knowledge in a controlled, investigative setting.

In conclusion, the diverse forms of experiential activities each play a unique role in enhancing the educational experience for primary education students at Tan Trao University. By incorporating hands-on manipulatives, interactive simulations, real-world problem-solving, collaborative projects, reflection, role-playing, field trips, and experimental activities, educators can create a rich and engaging learning environment that fosters deeper understanding and appreciation of mathematics. These activities not only help students grasp abstract concepts but also prepare them to apply their knowledge in practical, real-world situations, thereby equipping them with the skills necessary for future success. Through this research, we aim to highlight the importance of these varied forms of experiential learning in developing effective teaching methodologies and supporting the professional growth of future educators.
Current Status of Experiential Activity Design Skills in Mathematics Instruction for Primary Education Students at Tan Trao University

In the context of modern education, equipping primary education students with the skills to design experiential activities for mathematics instruction has become increasingly crucial. At Tan Trao University in Tuyen Quang Province, although efforts have been made to integrate new teaching methodologies into the curriculum, the current status of experiential activity design skills among students still faces several challenges.

Survey Results on Experiential Activity Design Skills

To comprehensively assess the current status of experiential activity design skills among primary education students, a survey was conducted using a structured questionnaire distributed to students enrolled in the course "Professional Skills Training in Mathematics Instruction at the Primary Level." The survey aimed to gather insights into students' perceptions, experiences, and proficiency in designing experiential activities. The results from the survey are summarized in Table 1 below:

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Percentage (%)</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding of Experiential Learning</td>
<td>45%</td>
<td>Students have a basic understanding but lack depth in experiential learning principles.</td>
</tr>
<tr>
<td>Knowledge of Design Methods</td>
<td>30%</td>
<td>Limited knowledge of specific design methods and techniques.</td>
</tr>
<tr>
<td>Use of Educational Tools and Resources</td>
<td>25%</td>
<td>Inadequate access to or familiarity with educational tools and resources for experiential activities.</td>
</tr>
<tr>
<td>Practical Application Opportunities</td>
<td>40%</td>
<td>Few opportunities to apply theoretical knowledge in real classroom settings.</td>
</tr>
<tr>
<td>Quality of Instructor Feedback</td>
<td>35%</td>
<td>Insufficient and infrequent feedback on design practices from instructors.</td>
</tr>
</tbody>
</table>

FINDINGS AND DISCUSSION

Understanding of Experiential Learning

The survey revealed that 45% of students have a basic understanding of experiential learning concepts. However, this knowledge is often superficial, with many students not fully grasping how to integrate these principles into effective activity design. [13] emphasized the importance of connecting theory with practice to foster deeper learning, suggesting that enhanced training in experiential learning principles could address this gap.

Knowledge of Design Methods

A significant 30% of students reported limited knowledge of specific design methods and techniques for creating experiential activities. This gap indicates a need for more comprehensive training in effective design strategies. [12] argued that specific guidance and training are crucial for developing effective experiential learning methods.

Use of Educational Tools and Resources

According to 25% of respondents, there is inadequate access to or familiarity with necessary educational tools and resources. This limitation affects the implementation of experiential activities. [17] highlighted the role of modern tools and technologies in creating engaging learning environments, underscoring the need for better resource allocation.

Practical Application Opportunities

Only 40% of students reported having sufficient opportunities to apply theoretical knowledge in real classroom settings. This lack of practical application opportunities limits the ability to develop and
refine experiential activity design skills. [18] emphasized that hands-on practice in authentic contexts is essential for skill development.

**Quality of Instructor Feedback**

The survey indicated that 35% of students found the feedback from instructors to be insufficient and infrequent. Effective feedback is critical for improving design skills and guiding students towards better practices. [19] stressed the importance of continuous feedback for skill development and reflective practice.

Despite efforts to integrate new teaching methods at Tan Trao University, the current status of experiential activity design skills among primary education students reveals several challenges. The survey results highlight gaps in understanding experiential learning principles, knowledge of design methods, access to resources, practical application opportunities, and the quality of instructor feedback. Addressing these issues through targeted training, improved resource allocation, and enhanced support from instructors is essential for developing students' abilities to design effective experiential activities. Such improvements will enhance the quality of mathematics instruction and better prepare future educators to create engaging and impactful learning experiences.

**Some Measures to Develop Experiential Activity Design Skills in Mathematics Instruction for Primary Education Students**

To enhance the skills of primary education students in designing experiential activities for mathematics instruction, several key measures can be implemented. Firstly, integrating comprehensive training programs that focus on experiential learning methodologies can equip students with the necessary knowledge and skills. Providing access to modern educational resources and technology is also crucial, as it enables students to develop and implement innovative activities effectively. Expanding opportunities for practical application through internships and hands-on experiences allows students to apply theoretical concepts in real-world settings. Additionally, improving mentorship and feedback mechanisms ensures that students receive constructive guidance to refine their skills. Finally, fostering a collaborative learning environment where students can work together and share insights promotes skill development and enriches their learning experience. By adopting these measures, educational institutions can significantly enhance the ability of students to design and execute effective experiential activities in mathematics instruction.

**Facilitating Students’ Exchange and Evaluation of the Experience Design Processes of Various Authors, and Proposing a Unique Design Process Illustrated with Specific Examples in Primary Mathematics Education**

To enhance students' deep understanding and effective application of the experience design process, instructors will introduce students to the experience design processes of various authors, accompanied by course materials. Concurrently, students will be organized into groups to discuss and critique the similarities and differences in the design processes proposed by different authors. Students may observe that the design processes presented by various authors differ in both the number and order of the steps involved. For instance, authors Nguyễn Mậu Đức and Đặng Thị Vân [3] propose an eight-step process, while Associate Professor Nguyễn Thùy Hồng and her team [5] outline a seven-step process. In contrast, author Vũ Thị Xuân Thu [7] suggests a six-step process, and Nguyễn Thị Thùy Trang [8] proposes a five-step design process.

Moreover, by analyzing each individual step within the distinct processes of various authors, students will gain a comprehensive understanding of the tasks required in designing an experiential activity. We expect that students will propose their own experience design processes based on their individual perspectives and present them to the class. Other students will then evaluate these proposed processes. Additionally, it is essential for the instructor to provide analysis, direction, suggestions, and guidance during the discussion to help students develop a comprehensive and suitable experience design process for teaching primary mathematics. This approach fosters students' flexible thinking, discourages rigid adherence to existing processes, and enhances their
research and problem-solving abilities. For example, students might propose a seven-step experience design process for primary mathematics as follows:

Step 1. Define the Objectives of the Activity: The objectives of the activity specify what students are expected to achieve upon participating. These objectives should be clearly defined, specific, appropriate, and reflect varying levels of required knowledge, skills, and attitudes. Depending on the characteristics of the students and the specific context of each class, the set of objectives should be tailored accordingly. Defining objectives will serve as the foundation for selecting content and adjusting the activity. It also provides a basis for evaluating the outcomes of the activity and contributes to stimulating students' active engagement.

Step 2. Extract the Content of the Lesson: For primary school mathematics, the 2024 general education curriculum has separated experiential content and specifically described the expected outcomes for this content. Therefore, each student only needs to effectively analyze the curriculum to identify exploitable content. Additionally, to select appropriate content, students must review textbooks and teaching plans to ensure alignment between the lesson and the experiential content within the curriculum.

Step 3. Select the Form of Experience: Suitable forms for primary mathematics include clubs, learning projects, games, practical activities, field trips, contests, and competitions. The choice of the experiential form depends on the content to be explored, the duration, the target students, and the practical conditions of each locality.

Step 4. Choose Methods, Forms, Tools, and Teaching Aids for the Activity: The selection of methods, teaching forms, and tools should be based on the content and form of the experience. Each experiential activity may utilize various methods and teaching forms, such as problem-based learning, cooperative learning, and project-based learning.

Step 5. Name the Activity: The name of the activity should reflect its theme, objectives, content, and form. It should be clear, precise, concise, and indicative of the activity's theme and content, creating an initial impression on students. The name should be engaging and attractive, generating a sense of excitement and positivity among students. Therefore, thoughtful consideration is needed when naming the activity.

Step 6. Develop Detailed Activity Plans: At this stage, it is necessary to determine how many activities need to be carried out, the duration of each activity, the content of each activity, the sequence of these activities, and the specific tasks for groups, teams, and individuals.

Step 7. Review, Adjust, and Refine the Activity: Review and check the content and sequence of tasks, the duration allocated to each task, and assess their rationality, feasibility, and the expected outcomes. If any errors or inconsistencies are identified in any phase, step, content, or task, they should be promptly adjusted. Finally, finalize the activity design and detail it in writing, which constitutes the activity organization plan. There is no fixed requirement for the number of steps in the experiential design process; what is crucial is that students understand the stages involved in the design process. Each student may break down the process into smaller steps or combine smaller phases into broader steps based on their personal judgment. After analyzing and identifying the necessary tasks in each design step, students will review the teaching content for each lesson and part to select suitable experiential content, applying the design process to create specific examples. An illustrative implementation might look as follows:

Step 1: Define the Objectives of the Activity
- Students consolidate their knowledge of statistics and chart construction.
- Practice measuring weight.
- Enhance awareness of saving, labor appreciation, and the importance of sharing and assisting those in difficult circumstances.
Step 2: Extract the Content of the Lesson

- Lesson Content:
  + Review of Quantities and Measurement in Grade 4 Mathematics: Using scales and practicing weighing through activities where students collect waste paper and weigh it in kilograms.
  + Statistical Elements in the Grade 4 Mathematics Curriculum: Creating tables, recording and analyzing data, and drawing column charts.

Step 3: Select the Form of Experience

- Form of Experience: Practical activity

Step 4: Choose Methods, Forms, Tools, and Teaching Aids for the Activity

- Teaching Methods: Group collaboration, hands-on practice.
- Teaching Forms: Individual, group, and worksheet-based instruction.
- Teaching Aids and Tools:
  + Teacher prepares 4 scales, 4 group worksheets, and individual worksheets.
  + Students prepare waste paper as instructed, along with pencils, colored pens, and rulers for chart drawing.

Step 5: Name the Activity

- Activity Name: “Small Plan”

Step 6: Develop Detailed Activity Plans

- The experiential activity “Small Plan” includes two components: 1 group activity and 1 individual activity.

Activity 1: Group Activity – Duration: 25 minutes

- Activity Content: Practice weighing waste paper.
- Teaching Aids and Tools:
  Teacher prepares 4 balance scales and 4 group worksheets;
  Students bring waste paper.
- Execution Process:
  Preparation: Announce the school’s “Small Plan” initiative to students, instructing each student to collect waste paper over the course of a week and bring it to class. The teacher should coordinate the timing so that all students bring their waste paper on the day of the mathematics lesson designed for this experiential activity.
  In-Class Implementation: Students work in groups, using balance scales to weigh each member’s waste paper in kilograms, record the results on the worksheet, calculate the total weight of the group’s waste paper, and document the result on the group worksheet. At the end of the activity, groups present their results to the class.

Activity 2: Individual Activity – Duration: 25 minutes

- Activity Content: Practice analyzing data.
- Teaching Aids and Tools:
  Teacher provides 4 individual worksheets.
  Students bring waste paper.
- Execution Process:
  Preparation: The teacher distributes the individual worksheets to students, along with waste paper. Students are instructed to collect data on the amount of waste paper they collected over the course of a week.
  In-Class Implementation: Students analyze the data collected from their individual activities and present their findings to the class.
Group Worksheet: Weighing Waste Paper

Activity Name: Small Plan

Group: [Enter Group Name]

Teacher's Name: [Enter Teacher's Name]

Date: [Enter Date]

Waste Paper Weighing Chart

1. Member Information:

<table>
<thead>
<tr>
<th>Member's Name</th>
<th>Weight of Waste Paper (kg)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member 1</td>
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<td>Member 1</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Activity Summary:

<table>
<thead>
<tr>
<th>Total Weight of Waste Paper (kg)</th>
<th>Notes</th>
</tr>
</thead>
</table>

- Activity 2: Individual Activity – Duration: 10 minutes
  + Activity Content: Complete the data table, create a chart, and analyze the chart.
  + Teaching Aids and Tools:
    - Teacher prepares individual worksheets.
    - Students bring pencils, colored pens, and rulers for chart drawing.
  + Execution Process:
    - Preparation: Implement the school's “Small Plan” initiative with the students, instructing each student to collect waste paper over the course of one week and bring it to class. The teacher should ensure that all students bring their waste paper simultaneously to align with the planned experiential activity for the mathematics lesson.
    - In-Class Implementation: Students work in groups to weigh each member’s waste paper using scales, record the results on the worksheet, calculate the total weight of the group’s waste paper, and document the result on the group worksheet. At the end of the activity, students present their group results to the class.
Complete the following table:

<table>
<thead>
<tr>
<th>Group</th>
<th>Weight of Waste Paper (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
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<tr>
<td>Group 2</td>
<td></td>
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<tr>
<td>Group 3</td>
<td></td>
</tr>
<tr>
<td>Group 4</td>
<td></td>
</tr>
</tbody>
</table>

Complete the following chart:

- | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 0 |
- |----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
- | Group 1 | Group 2 | Group 3 | Group 4 | Group 1 | Group 2 | Group 3 | Group 4 | Group 1 | Group 2 |

Answer the questions:

The group that collected the most waste paper is: .............................................
The average weight of waste paper collected by each group is:......................

Step 7: Review, Adjust, and Finalize the Activity

**Innovating Teaching Methods and Assessment Approaches towards Competency-Based Learning**

The content of experiential activities in mathematics has been integrated into the course "Training Teaching Skills in Primary School Mathematics." This course is allocated in the first semester of the fourth year with a duration of 2 credits. During the 2022-2023 academic year, while teaching this course, we maintained the previous objectives aimed at developing essential skills for teaching mathematics in primary schools, such as program analysis skills, the ability to select and use mathematical exercises, and the ability to handle teaching situations in primary mathematics. Additionally, we updated and incorporated the skill of designing experiential activities in primary school mathematics into this course.

To enhance the effectiveness of teaching the course "Training Teaching Skills in Primary School Mathematics" in general, and the content of experiential activities in mathematics in particular, we
recognize the need to innovate teaching methods and assessment approaches. Instructors should focus on selecting methods that promote student engagement, allowing them to explore, discover, and apply knowledge to solve practical problems. For example, instructors can provide materials and videos on the subject matter through the Google Classroom system and assign tasks for students to work in groups of six. Each group will study the curriculum and textbooks of a specific grade within a particular knowledge strand, such as Numbers and Operations, Geometry and Measurement, or Elements of Statistics and Probability. From there, students will select lessons with practical content that aligns with the experiential content in the mathematics program, then present ideas for developing the lesson and designing experiential activities.

For this task, instructors will require groups to complete their reports, upload them to the Google Classroom application for peer review, and evaluate the quality of each other's products on the application before presenting and discussing them in class. Implementing the flipped classroom model optimizes class time, allowing more time for in-depth discussion and creating richer learning opportunities for students. Alongside the flipped classroom model, instructors must also pay attention to assessment methods. Clear evaluation criteria for individual or group products should be established and communicated to each student before they undertake the task, providing a basis for self-assessment and peer assessment. Additionally, diversifying assessment methods, combining formative and summative assessments, provides a comprehensive view of each student's competencies, thereby identifying solutions to assist students in developing and enhancing their professional skills.

Collaborating with Primary School Teachers to Provide Opportunities for Students to Observe, Attend Classes, and Understand Experiential Activities

Research and practice at the university level provide students with a foundational knowledge and initial skills in designing experiential activities. However, allowing students to observe, attend classes, and gain practical insights into the construction and organization of experiential activities at primary schools is essential. This opportunity enables students to directly observe and participate in supporting experiential activities at primary schools. Students can learn from the experiences of primary school teachers, engage in discussions, and share their concerns about experiential activities. This combined learning and practical experience model not only strengthens students' design skills but also boosts their confidence in organizing experiential activities.

Currently, Tan Trao University does not have a primary school practice model, so students only visit primary schools during their teaching practice periods in the sixth and eighth semesters, as per the training program. During these two practice periods, guiding instructors should maximize their leadership role by collaborating with primary schools to create opportunities for students to observe classes, understand teaching and education plans, and allow students to actively participate in experiential activities organized by the schools. This approach helps students enhance their professional skills and accumulate valuable experience.

To improve the training of experiential activity design skills in teaching mathematics for primary education students, instructors should propose to the university and department leaders that students be allowed to visit and observe the planning and organization of experiential activities at primary schools alongside their university coursework. This approach not only provides students with practical exposure during their theoretical studies but also offers opportunities to apply theoretical knowledge to solve practical problems, enhancing student engagement, deep understanding, long-term retention, and creativity.

Adjusting and Updating the Curriculum for Primary Education Students to Include Experiential Activity Content

Currently, the primary school curriculum consists of 11 subjects and 1 activity, positioning experiential activities on an equal footing with a subject. When considering experiential activities, they can be divided into two main categories:
1. Experiential Activities as a Standalone Component:

- These activities are conducted within the school through the organization of activities inside and outside the classroom, both within and outside the school. They are organized at various levels, including group, class, grade, or school-wide scales. The primary types of activities include Flag Salute Sessions, Class Activities, Thematic Educational Activities, and Club Activities. These activities involve the participation, coordination, and collaboration of various educational forces both within and outside the school.

2. Experiential Activities Integrated with Specific Subjects:

- Currently, the mathematics curriculum best exemplifies the integration of experiential content at the primary school level. The mathematics curriculum includes a distinct section with specific requirements for experiential practice. Students engage in experiential practice through conducting projects and research on mathematics, particularly those related to the practical applications of mathematics. These activities include organizing mathematics games, math clubs, forums, seminars, and mathematics competitions, as well as publishing mathematical newsletters. Visiting educational and research institutions and interacting with students who have a passion for mathematics are also part of these activities. These experiential activities allow students to apply accumulated knowledge, skills, attitudes, and personal experiences creatively to real-life situations. They provide opportunities for students to explore knowledge, develop skills, become more confident, and cultivate mathematical competencies.

We recognize that the current Primary Education program at Tân Trào University lacks a course that equips students with general theoretical knowledge about experiential activities. Currently, third- and fourth-year students only explore these concepts through subject-specific teaching methods courses. This means that students only learn about experiential activities within the context of individual subjects, without a broader understanding of experiential learning principles. As a result, most students have a vague and superficial understanding of experiential theory. A practical solution is to update the curriculum by adding a course on "Practical Organization of Experiential Activities in Primary Schools." This course would equip students with the knowledge and skills necessary to design and organize experiential activities, thereby enhancing their professional competence. Additionally, this course would provide a foundational basis for students to more easily approach experiential content within primary school subjects through subject-specific teaching methods courses.

CONCLUSION

In the process of training future primary education teachers, it is essential to develop their skills in designing experiential activities for teaching mathematics. This paper has proposed four measures to help students hone these skills. These measures serve both as recommendations for the department and the university to adjust the curriculum and practical training programs, and as practical methods for students to employ when teaching specific courses, particularly the course on Professional Practice in Teaching Mathematics at the Primary Level.

Designing experiential activities requires students to have a deep understanding of theoretical principles as well as practical experience. Systematic and regular self-practice is crucial for the formation and development of these skills. Thus, students need to engage in consistent and structured practice. Developing these skills within teacher training programs will enable students to teach mathematics confidently in primary schools, ultimately contributing to the improvement of the quality of mathematics education at the primary level.

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Reference

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