EVALUATING THE EFFECTIVENESS OF AGILE PROJECT MANAGEMENT IN EDUCATIONAL PRACTICE: AN EXPERIMENTAL STUDY

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Abstract, *Fast changes in today's schools call for lessons that get students moving, working together, yet building real abilities. Into this space steps a look at how Agile methods might shape classroom work. One setup tested two batches of learners - same goals, different paths. On one side, a team used old-style project tasks without special structure. On the opposite, another crew broke work into short cycles, tracked progress on boards, adjusted weekly. Learning unfolded in bursts, marked by check-ins, visible charts, shared duties. Not every method fits all, but patterns emerged from the way tasks were handled. Progress wasn't just about results - it showed in how students stepped up, stayed tuned, reshaped plans.*

Twelve weeks into the term, student progress in grades, drive, class involvement, and skill growth came under review. Those using Agile methods pulled ahead in achievement while showing sharper collaboration and thinking skills than peers not using them. Learning through Agile seems to boost how well students pick up knowledge - also building real-world abilities today's jobs demand.

Keywords: *Agile project management, project-based learning, student engagement, Scrum, Kanban, competency development, educational innovation, experimental research*

Introduction

Schools today aim to teach both ideas and hands-on skills so learners can handle actual job demands. Instead of just listening, students need chances to work together and tackle challenges on their own - something old-style teaching rarely allows. Because of this gap, many instructors now look at different ways to boost involvement, self-direction, and deeper thought. A method gaining attention involves using Agile techniques, usually found in tech projects, within classroom activities. Working fast and adjusting often matters more than sticking to old plans. Some groups follow Scrum or Kanban - ways of organizing work that bend without breaking. These setups keep everyone on track by showing what's done and who is doing what. Progress shows up piece by piece, not all at once. People talk regularly instead of waiting until the end. Clear sight into daily efforts helps teams stay responsible without pressure from above.

Start with small loops of activity, then watch how kids begin shaping their own understanding through doing. Instead of one big test at year's end, they get responses again

and again - each time adjusting, thinking, growing. Ownership grows quietly here, built not by rules but by repeated chances to act and respond. Skills like talking clearly, working together, solving issues - they rise naturally when every lesson feels alive, changing daily. Learning moves because the structure allows it to breathe, shift, adapt.

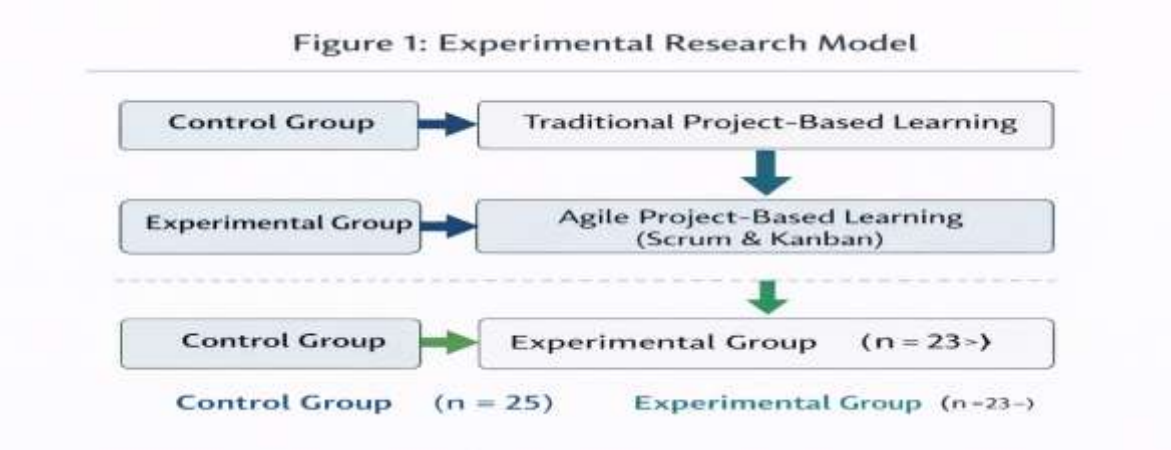
Aiming to test how well Agile project management works in education, this study uses an experimental setup. With hands-on trials guiding the approach, learning environments are put under observation. Instead of theory alone, real classroom actions shape the findings. Through structured tests rather than assumptions, outcomes take form. By watching teams adapt, insights emerge from actual use. Not relying on past models, fresh data drives conclusions.

Methodology

Research Design

From the start, one group joined activities while another stayed aside for comparison. Students taking part were undergrads picked without full random selection. The setup watched changes over time instead of using strict controls. Learning patterns emerged when outcomes shifted between each set. Moments after beginning, differences started showing in how both groups responded. A quarter of the participants dove into hands-on projects shaped by Agile methods. Sprints borrowed from Scrum pushed fast cycles. Visual workflow tools similar to Kanban guided their progress. Twenty-five learners made up this test setup. A quarter of participants followed the standard curriculum using conventional methods. Their work unfolded step by step, guided by typical assignment structures. This path skipped any Agile techniques entirely. Each task moved forward in sequence, without sprints or stand-ups. Twenty-five learners stayed on this steady track throughout. A span of twelve weeks marked the duration of the study - equal to a single term at school.

Figure 1. Research Design Model



Data Collection Instruments

Several instruments were used to collect data during the study.

1. Academic Performance Assessment: Students' academic achievement was evaluated using pre-tests and post-tests designed to measure knowledge acquisition related to the course topics.

2. Motivation and Engagement Survey: A structured questionnaire based on a Likert scale was used to assess students' motivation, classroom participation, and attitudes toward the learning process.

3. Competency Evaluation Rubric: Students' competencies were evaluated using a rubric measuring the following skills:

- teamwork
- problem-solving ability
- independent decision-making
- communication skills

Implementation Procedure: The implementation of Agile project management in the experimental group followed several structured stages.

Sprint Planning: At the beginning of each two-week sprint, students defined project goals, tasks, and expected outcomes.

Execution Phase: Students worked collaboratively in teams while instructors assumed the role of **facilitators or Scrum Masters**, guiding the process rather than directly controlling it.

Monitoring and Feedback: Progress was monitored using **Kanban boards**, which visually displayed the status of tasks. Regular feedback sessions were conducted to help students improve their work.

Reflection and Retrospective: At the end of each sprint, teams participated in retrospective discussions to evaluate achievements, challenges, and potential improvements.

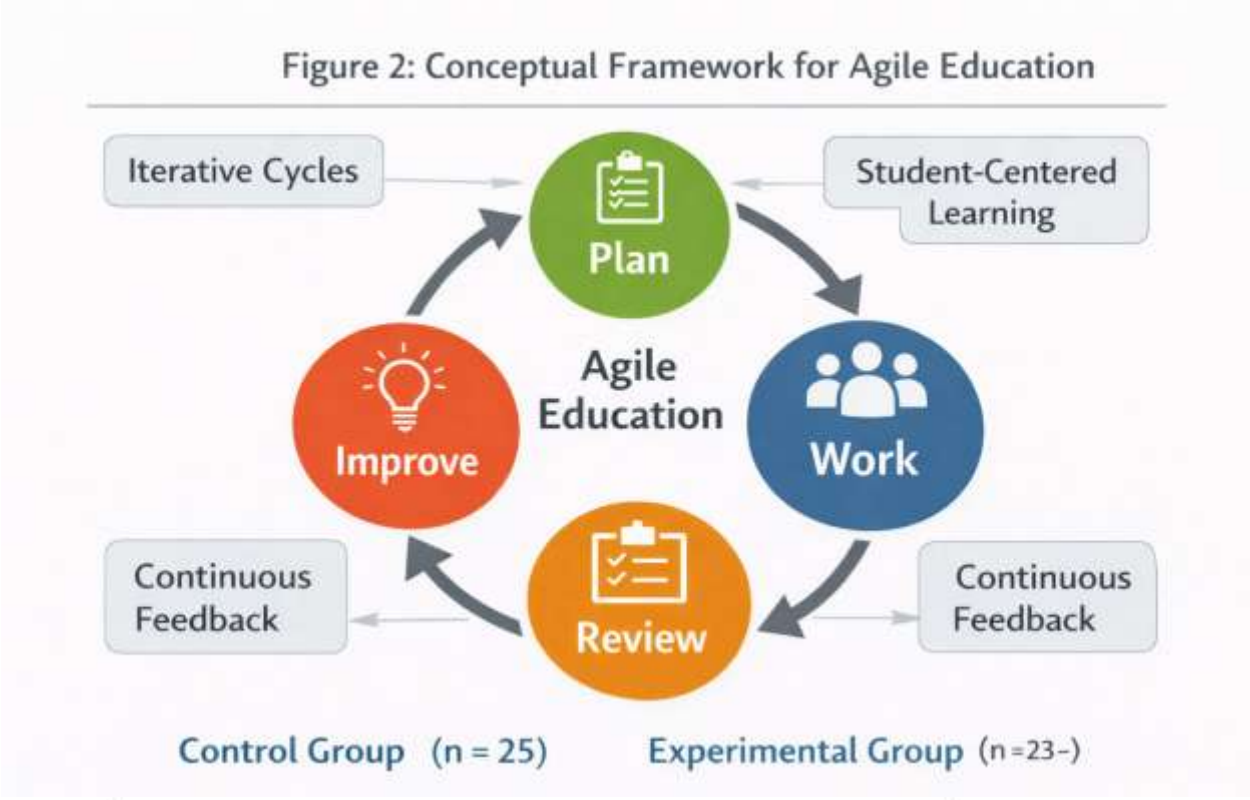


Figure 2. Agile Learning Cycle in Education

Results

Academic Performance

The results indicate that students who participated in the Agile-based learning environment demonstrated significantly higher academic progress compared to the control group.

Table 1. Pre-test and Post-test Results

Group	Pre-test (%)	Post-test (%)	Improvement
Control	64	70	9.4%
Experimental	65	83	27.7%

The improvement observed in the experimental group was nearly three times higher than that of the control group.

Student Motivation and Engagement

Survey findings revealed noticeable improvements in students' motivation levels.

- **Experimental group:** motivation increased from **4.2 to 4.8 (out of 5)**
- **Control group:** motivation increased from **4.1 to 4.3** Students working in Agile teams reported stronger engagement, better collaboration, and greater satisfaction with the learning process.

Competency Development

Table 2. Competency Development Results

Competency	Control Group	Experimental Group
Teamwork	3.8	4.6
Problem solving	3.6	4.5
Decision making	3.5	4.4

The experimental group demonstrated stronger development across all measured competencies

Discussion

The findings of this study confirm that the integration of Agile project management into educational practice provides several important benefits.

First, Agile methods significantly improved students' academic performance by promoting continuous learning cycles and iterative feedback. Second, the collaborative structure of Scrum teams increased student motivation and engagement in the learning process. Third, the use of Kanban boards enhanced transparency and helped students manage their responsibilities effectively.

Another important outcome of the study was the transformation of the teacher's role. Instead of functioning solely as a knowledge provider, the instructor acted as a facilitator who supported students' independent learning and problem-solving activities. This shift encouraged students to take greater responsibility for their learning outcomes.

Furthermore, Agile frameworks allowed flexible adaptation of learning activities according to students' progress and challenges, which contributed to a more responsive and inclusive learning environment.

Conclusion, the results of this experimental study demonstrate that the application of Agile project management methodologies in educational practice can significantly improve learning outcomes. Students participating in Agile-based project learning achieved higher academic performance, greater motivation, and stronger competency development compared to students in traditional project-based learning environments. The findings suggest that integrating Agile methodologies such as Scrum and Kanban into educational curricula can provide valuable opportunities for developing the collaborative and problem-solving skills required in modern professional contexts. Future research may explore the long-term impact of Agile-based education and its application across different academic disciplines and educational levels.

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