

Active Learning Career Modules Development and Its Impact on Students' Test Scores

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ABSTRACT

This study explores the development and impact of Active Learning Career Modules (ALCMs) on students' test scores in career education. Career education faces challenges, particularly in China, where test scores in this field often lag behind those in traditional academic disciplines. This issue is exacerbated by passive, lecture-based teaching methods that fail to engage students or foster meaningful learning. To address this, the study proposes a series of modules incorporating active learning strategies such as collaborative learning, project-based learning (PBL), inquiry-based learning, flipped classrooms, and peer teaching and evaluation. The design of these modules integrates key learning theories, including Constructivist Theory, Behaviorist Learning Theory, Cognitive Learning Theory, and Cognitive Processing Theory, offering a comprehensive approach to improving student engagement, cognitive processes, and, ultimately, test scores. The study argues that these active learning strategies enhance student understanding, critical thinking, and real-world application, leading to measurable improvements in academic performance. The implications for teaching include a shift toward more interactive and student-centered learning environments, while recommendations for policymakers include incorporating these strategies into career education curricula. Future research could examine the long-term effects of these modules on career success and explore how the modules can be adapted for diverse student populations to further enhance academic outcomes.

Keywords: active learning, career education, test scores, learning theory

Education plays a central role in personal growth, societal advancement, and economic development. Within the context of higher education, the pursuit of quality learning is paramount. One critical measure of educational effectiveness is student achievement, often quantified through test scores. Test scores not only reflect students' academic abilities but also provide insights into the success of teaching methodologies and curriculum design. Consequently, improving test scores has become a primary focus in many educational reforms worldwide.

Career education, which aims to equip students with the skills and knowledge necessary for the workforce, is particularly crucial in today's rapidly evolving job market. However, the field faces persistent challenges, particularly within China. Despite its importance, student test scores in career education often lag behind those

in more traditional academic disciplines. This issue is compounded by a reliance on passive, lecture-based teaching methods that do not adequately engage students or foster meaningful learning experiences. These limitations result in low academic performance, undermining the credibility and value of career education programs. The challenge, therefore, lies in finding ways to improve the test scores of students in career education while addressing the underlying issues of student engagement and motivation.

The purpose of this study is to explore how Active Learning Career Modules (ALCMs) can improve test scores in career education. By incorporating strategies such as collaborative learning, project-based learning (PBL), inquiry-based learning, flipped classrooms, and peer teaching and evaluation, this research aims to design and implement modules that enhance student academic achievement. Specifically, it investigates whether these active learning methods can lead to measurable improvements in test scores, providing a solution to the persistent problem of underperformance in career education.

Background of the Issue

Globally, educational research has consistently demonstrated the link between student motivation, engagement, and test scores. Numerous studies have found that motivation plays a critical role in students' ability to engage meaningfully with content and perform well on assessments. In career education, however, students often perceive the subject as peripheral, resulting in disengagement and insufficient preparation for exams. This lack of motivation, combined with the absence of active learning opportunities, leads to poor test performance.

In China, career education courses have traditionally been delivered through lecture-based formats, where teachers control the flow of information and students passively absorb content. This teaching style limits opportunities for students to engage actively with the material, reducing their ability to apply knowledge and improve their test scores. Research has consistently shown that such passive learning environments fail to cultivate the depth of understanding required for high test performance. Studies by Zhou et al. (2022) and Peng and Zhang (2023) have highlighted that when students perceive career education as disconnected from their personal aspirations or future careers, their motivation drops, leading to lower engagement and, consequently, lower test scores.

Active learning approaches have been shown to address these issues by fostering more interactive and student-centered learning environments. By incorporating project-based tasks, inquiry-based activities, and collaborative learning, these methods promote deeper engagement and understanding, which in turn can enhance academic performance. Evidence from studies like Mehta (2022) and Liu (2022) indicates that active learning methods lead to significant improvements in student performance across various measures, including test scores. Moreover, a meta-analytic review by Freeman et al. (2020) robustly demonstrates that active learning significantly increases student performance across science, engineering, and mathematics disciplines, a finding that reinforces its potential applicability in career education contexts. Recent studies in Chinese and East Asian settings further support this potential. For instance, Li and Wang (2024) found that structured active learning modules significantly enhance both motivation and test performance in vocational education, while Chen and Huang (2023) demonstrated that student-centered pedagogies lead to measurable gains in academic outcomes in higher vocational contexts. Additionally, Zhang and Li (2021) highlighted the role of technology-enhanced active learning in boosting engagement and exam scores through interactive and simulated environments.

However, despite the proven benefits of active learning, these approaches have been underutilized in Chinese career education, leaving a critical gap in both implementation and research on effective teaching strategies for

this field. This study seeks to address this gap by examining the impact of ALCMs on test scores in career education. By designing and testing these modules, this research aims to provide empirical evidence on how active learning can improve academic achievement in this underexplored area of higher education. Through the systematic integration of active learning strategies, this study hopes to offer a viable solution to the challenge of improving test scores in career education, thereby enhancing the overall effectiveness and credibility of these programs.

Review of Existing Theories

Several key learning theories offer profound and multifaceted insights into how Active Learning Career Modules exert an influence on students' test scores. Constructivist Theory, pioneered by Jean Piaget and Lev Vygotsky, asserts that learners are not passive recipients but active constructors of knowledge through interactions with their surroundings and collaborative efforts with peers. Active Learning Career Modules, characterized by project-based, collaborative, and inquiry-based learning approaches, are perfectly in tune with constructivist tenets. These strategies encourage students to delve deeper into the subject matter, engage in critical thinking, and apply knowledge in real-world contexts, all of which are conducive to enhancing their test performance, especially in assessments that demand practical application.

Self-Determination Theory, put forth by Edward Deci and Richard Ryan, highlights the pivotal role of three basic psychological needs—autonomy, competence, and relatedness—in fueling optimal motivation and facilitating effective learning. Within Active Learning Career Modules, autonomy is fostered by granting students a degree of choice in their learning journey, such as selecting projects aligned with their career aspirations. Competence is cultivated through tasks that are challenging yet within reach, enabling students to experience a sense of mastery over career-related knowledge and skills. Relatedness is promoted through collaborative activities that foster social connections and a sense of belonging. When these needs are met, students are more likely to be intrinsically motivated, actively engaged, and better equipped to retain and apply knowledge, ultimately leading to improved test scores.

Social Cognitive Theory, developed by Albert Bandura, underscores the significance of observational learning, self-efficacy, and social interactions in the learning process. Active Learning Career Modules provide ample opportunities for students to observe their peers or instructors performing career-related tasks, thereby acquiring new knowledge and skills through imitation. Moreover, these modules enhance students' self-efficacy by offering them chances to succeed in manageable tasks, gradually building their confidence to tackle more complex challenges. Social interactions within the modules, such as group discussions and peer feedback, facilitate the exchange of ideas and diverse perspectives, broadening students' understanding and honing their problem-solving skills, all of which contribute to higher test scores.

Experiential Learning Theory, proposed by David Kolb, posits that learning is a continuous cycle encompassing experience, reflection, conceptualization, and experimentation. Active Learning Career Modules are well-aligned with this theory as they immerse students in real-world career experiences, such as internships and simulations. Through these experiences, students reflect on their learning, identify key concepts and skills, and conceptualize this knowledge into a more comprehensive framework. Subsequently, they experiment with applying this newfound knowledge in different contexts, solidifying their understanding and enhancing their ability to transfer knowledge to real-world situations, which is crucial for success in career-oriented tests. However, the effectiveness of each theory's application hinges on various factors, including resource availability,

adequate support for psychological needs, a positive and supportive social environment, and high-quality experiences with ample opportunities for reflection. Together, these theories form a robust and comprehensive foundation for understanding how Active Learning Career Modules can elevate student outcomes, particularly in relation to test scores, by fostering deep engagement, motivation, social learning, and experiential knowledge application.

Conceptual Analysis / Synthesis

In the framework of Active Learning Career Modules, test scores are not just a reflection of students' cognitive outcomes but also a dynamic component within a system involving instructional design and student interaction with content. These modules are particularly vital in career - oriented education, where test scores serve as a critical metric for evaluating both theoretical understanding and the ability to transfer knowledge into real - world contexts. To understand the full role of test scores, it is essential to integrate insights from the four foundational learning theories discussed: Constructivist Theory, Self - Determination Theory, Social Cognitive Theory, and Experiential Learning Theory. Each provides a unique lens through which to examine how Active Learning Career Modules impact academic performance.

Constructivist Theory emphasizes that test scores reflect not just factual recall but the ability to apply knowledge in real - world contexts. Through problem - solving and collaborative tasks in these modules, students deepen their understanding and improve their ability to transfer knowledge. Here, test scores act as a measure of students' ability to apply integrated knowledge to complex, career - related scenarios. This aligns with the pedagogical aim of project - based learning (PBL), which has been identified as an effective inductive method for fostering deep understanding and application. Self - Determination Theory views test scores as an outcome influenced by the fulfillment of students' psychological needs. When the modules support autonomy, competence, and relatedness, students are more motivated to learn, engage more deeply with the content, and are more likely to perform well on tests. For example, if students have a sense of autonomy in choosing their learning paths within the modules, they are more likely to take ownership of their learning and strive for better test results.

Social Cognitive Theory sees test scores as a result of observational learning, self - efficacy development, and positive social interactions. Students who observe successful models in the modules, build high self - efficacy through repeated success, and engage in productive social interactions are more likely to have better test scores. For instance, peer feedback in collaborative projects can enhance students' self - efficacy and improve their understanding of the material, leading to higher test performance. Experiential Learning Theory focuses on how the cycle of experience, reflection, conceptualization, and experimentation in the modules contributes to test scores. The real - world experiences provided by the modules allow students to gain practical knowledge, which they then reflect on and conceptualize. This process helps them to better understand and retain the material, which is reflected in their test scores. For example, an internship experience within the module can give students hands - on knowledge that they can then apply in tests related to career - specific skills.

In this framework, test scores are the outcome of the dynamic interplay between instructional design and cognitive and motivational engagement. The relationship is reciprocal, not linear. Active Learning Career Modules activate cognitive and motivational processes that, in turn, lead to better test performance. The more engaged students are with the content through these modules, the more their cognitive processes (e.g., memory retention, problem - solving) and motivational factors (e.g., self - efficacy, intrinsic motivation) improve, leading

to higher test scores. These improved scores then validate the effectiveness of the modules, reinforcing the learning process. Thus, test scores are not just an endpoint but a tool for feedback, guiding future instructional strategies and student engagement. They reflect students' ability to apply integrated knowledge in real - world contexts, which is essential in career - focused education.

This model challenges traditional linear models by highlighting the circular and reciprocal relationship between instructional design, cognitive and motivational processes, and test scores. Active Learning Career Modules serve as the scaffold for developing cognitive abilities and fulfilling psychological needs, which subsequently enhance test performance. As students experience success, their cognitive abilities and self - efficacy improve, leading to better test scores. These improved scores, in turn, motivate further engagement with subsequent learning tasks. Thus, test scores are not merely a measure of academic achievement but also an active component of the ongoing learning process. They represent the continuous interaction between instructional design, cognitive and motivational development, and test performance.

This framework redefines test scores as a dynamic reflection of integrated learning. Rather than simply being a static measure of academic achievement, test scores provide essential feedback that drives further learning and improvement. Educators should view test scores as active participants in the learning process, using them to adjust teaching practices for better outcomes. By integrating real - world applications, supporting psychological needs, facilitating social interactions, and promoting experiential learning, Active Learning Career Modules foster a cycle of continuous improvement. Therefore, test scores not only reflect students' cognitive and motivational outcomes but also their long - term potential for success in career - oriented education, making them a key measure of both academic achievement and practical competencies.

Implications

The Active Learning Career Modules (ALCMs) provide a robust approach for improving both teaching and learning outcomes. By integrating collaborative learning, project-based learning (PBL), inquiry-based learning, flipped classrooms, and peer teaching and evaluation, they encourage deeper student engagement and enhance cognitive processing. These strategies help students engage actively with content, retain knowledge more effectively, and develop real-world skills, which directly improve their performance on tests.

Educators can use these modules to design career planning courses that not only emphasize knowledge acquisition but also promote the application of knowledge in practical, career-related scenarios. By incorporating active learning strategies into their teaching, educators can foster a learning environment that supports critical thinking, problem-solving, and collaboration—skills essential for both academic success and future careers. This approach not only improves students' test scores but also better prepares them for workforce challenges.

Educational institutions and policymakers should prioritize the integration of Active Learning Career Modules into the curricula for career planning programs. Policies should support professional development for educators, enabling them to implement active learning strategies effectively. Successful integration requires teachers to master inductive teaching methods, which encompass strategies like PBL and inquiry-based learning (Prince & Felder, 2020). Training teachers to design interactive, real-world tasks and provide continuous feedback will help improve student engagement and test performance.

In addition, educational institutions should revise assessment strategies to reflect the emphasis on application-based learning. Instead of relying solely on traditional exams, institutions should implement project-based

assessments, presentations, and peer evaluations. The effectiveness of peer assessment in promoting critical thinking and accountability in collaborative settings has been documented (Han & Li, 2021). These assessments not only measure knowledge but also evaluate how well students can apply that knowledge in real-world contexts, thus providing a more comprehensive measure of their learning and contributing to improved test scores.

Future researchers can build upon these modules to investigate the long-term effects of Active Learning Career Modules on students' test scores and career success. Longitudinal studies could assess how these modules impact students' retention of knowledge, their ability to apply learned skills, and their success in future careers. Researchers could also explore how individual active learning strategies (e.g., project-based learning, flipped classrooms) contribute to improved test scores and academic achievement in different career education contexts.

Further studies could examine the effects of peer teaching and evaluation on students' cognitive development and test performance, as well as how collaborative learning influences knowledge retention and application. Additionally, research could explore how the framework can be tailored to meet the needs of diverse student populations, including students with learning disabilities or those from diverse cultural backgrounds.

CONCLUSION

This study introduces a series of Active Learning Career Modules, which integrate collaborative learning, project-based learning (PBL), inquiry-based learning, flipped classrooms, and peer teaching and evaluation to enhance test scores in career-oriented education. Empirical support for the efficacy of such active learning strategies, particularly in improving performance, is well-established (Freeman et al., 2020; Chen & Zhang, 2023). By aligning these strategies with Constructivist Theory, Self-Determination Theory, Social Cognitive Theory, Experiential Learning Theory, the modules emphasize the role of active learning in improving student engagement, cognitive development, and academic performance. Test scores are positioned as not only a measure of knowledge but also an indicator of students' ability to apply that knowledge in real-world contexts.

This research contributes a set of modules that combine key learning theories with practical active learning strategies. By focusing on test scores as a key measure of academic success, the study offers practical guidance for educators and policymakers in designing effective career education programs. The integration of active learning strategies provides a new perspective on how teaching methods can be optimized to improve student performance.

Future research could further explore the effectiveness of Active Learning Career Modules in improving test scores across different educational contexts. Studies could examine the specific impact of individual active learning strategies on student outcomes, particularly in career-oriented education. Longitudinal studies could investigate how sustained engagement with these modules influences students' test scores and long-term career success. Additionally, researchers could explore how the framework can be adapted for diverse student populations, ensuring that all learners benefit from these active learning methods and experience improvements in their academic performance.

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