Blending of collaborative and active learning instructional methods to improve academic performance and self-motivation of vocational students

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Abstract

This study delves into the integration of collaborative and active learning methodologies as a means to enhance both academic achievement and self-motivation among students in the realm of vocational education. Collaborative learning, with its emphasis on teamwork, problem-solving, and social responsibility, complements the active learning approach, which fosters autonomy, deep understanding, and critical thinking. Together, these strategies form a comprehensive framework that not only facilitates academic excellence but also cultivates the lifelong learning skills imperative for sustained career success. While the potential benefits of collaborative and active learning are evident, the study acknowledges the existence of practical challenges, including limited resources and resistance from educators. Addressing these challenges is paramount for the effective implementation of these pedagogical approaches. Overcoming such obstacles will empower vocational education to harness the transformative potential of collaboration and active learning, equipping students with the necessary skills and motivation to thrive in their chosen careers. By navigating these challenges successfully, educators and institutions can create an environment that prepares students not only for the demands of their immediate professions but also for the dynamic challenges of the evolving professional landscape.

Keywords: Academic achievement, Active learning, Collaborative learning, Self motivation.

Contents

Contribution of this paper to the literature
This study contributes to the existing literature by uniquely focusing on the integration of collaborative and active learning in vocational education. It goes beyond isolated examinations of these methodologies, presenting a holistic approach that addresses challenges specific to vocational settings. This distinctive perspective offers practical insights for educators and policymakers seeking innovative solutions to enhance student outcomes in vocational education.

1. Introduction

In recent years, the Chinese government has significantly increased its investment in vocational education to enhance students' academic performance and self-motivation in vocational colleges. However, traditional teaching methods in vocational education tend to promote passive learning, which can hinder active student engagement and practical knowledge application, consequently leading to suboptimal academic performance and motivation. Researchers and policymakers actively explore active and collaborative learning methods to address this problem.

Collaborative learning is an instructional approach that strongly emphasizes active participation and cooperation among students throughout the learning process. As AbuSeileek (2012) articulated, collaborative learning fosters positive interdependence, individual accountability, face-to-face interaction, and the development of vital social skills. When students collaborate on tasks and projects, vocational students can enhance their problem-solving, critical thinking, and communication skills. This approach also cultivates a sense of belonging and mutual support among students, creating an environment conducive to heightened motivation for learning.

Active learning involves students actively participating in the learning process through various activities, including discussions, experiments, and hands-on projects. Active learning methods encourage students to take responsibility for their learning and promote higher-order thinking skills, as Sekwena (2023) highlighted. For vocational students, active learning provides opportunities to apply theoretical concepts in practical scenarios, enhancing their problem-solving skills and preparing them for real-world challenges.

International policy documents, such as *the European Commission's New Skills Agenda* and *UNESCO's Education 2030 Framework for Action*, explicitly emphasize the importance of these methods in vocational education (European Commission, 2012; UNESCO, 2015). These policy frameworks highlight the significance of learner-centered approaches that foster collaboration and active engagement to improve vocational students' learning outcomes and motivation. This research seeks to explore the effectiveness of an instructional approach based on collaborative and active learning in improving vocational education students' academic achievement and self-motivation. Nevertheless, implementing these methods in educational practices still needs practical challenges, including limited resources and resistance from educators.

2. Fostering Excellence: A Comprehensive Approach to Enhance Vocational Education

2.1. Practical Significance

Enhanced Learning Achievement: The proposed instructional approach based on collaborative learning and active learning has the potential to improve the learning achievement of vocational students significantly. This approach promotes more profound understanding and knowledge retention by actively engaging students in collaborative activities, such as group discussions, projects, and problem-solving tasks. The interactive nature of collaborative learning fosters critical thinking, communication skills, and teamwork, which are essential for success in vocational fields.

Real-world Skills Development: Vocational education aims to equip students with practical skills directly applicable in the workplace. By incorporating active learning strategies into vocational instruction, students are exposed to real-world scenarios and challenges. This approach allows them to develop problem-solving abilities, adaptability, and decision-making skills, which are crucial for vocational success. Students can bridge the gap between theoretical knowledge and practical application by actively engaging in hands-on activities, such as simulations, case studies, and role-plays.

Self-Motivation and Autonomy: The proposed instructional approach promotes self-motivation among vocational students. Collaborative learning encourages students to take ownership of their learning process, fostering a sense of autonomy and independence. By actively participating in group activities and projects, students develop self-regulation skills, goal-setting abilities, and the confidence to take initiative. This approach empowers students to become active learners, motivating them to explore and discover knowledge beyond the classroom, which is crucial for lifelong learning and career advancement.

2.2. Theoretical Significance

Constructivist Learning Theory: The proposed instructional approach aligns with the constructivist learning theory, which emphasizes the active construction of knowledge through social interactions and meaningful experiences. Students actively construct their understanding of vocational concepts by engaging in collaborative learning activities, leading to deeper comprehension and long-term retention. This approach supports the notion that learning is a social process and students learn best by actively engaging with their peers and the learning environment.

Motivation and Engagement Theories: The instructional approach based on collaborative learning and active learning aligns with motivational and engagement theories. The approach taps into intrinsic motivation by providing students with opportunities for active participation, fostering a sense of ownership and personal relevance. The collaborative nature of the approach promotes social interaction and peer support, which have been shown to enhance motivation and engagement. The approach stimulates students' curiosity and interest by incorporating elements such as problem-solving tasks, hands-on activities, and real-world applications, leading to sustained motivation and a positive learning experience.

3. Blended Pedagogy: Based on Collaborative and Active Learning

3.1. Collaborative Learning

Cooperative learning, an educational approach promoting collaboration and active group participation, enhances learning by encouraging students to interact, share ideas, and support each other's learning. It is rooted in the belief that students learn best when actively engaged and able to discuss and explain their ideas to peers, benefiting from diverse perspectives (Laal, 2012). Structured cooperative learning activities typically include positive interdependence and individual accountability, with each student responsible for the group's success (Nam & Zellner, 2011; Smith, 1996). In addition to academic gains, cooperative learning fosters a positive classroom environment, positive student relationships, and enhanced self-esteem and self-confidence. It also nurtures critical thinking, problem-solving, and teamwork abilities crucial for the modern workforce (Kivunja, 2014; Tang, 2020).

Cooperative learning, recognized for its value in enhancing academic achievement, social development, and critical thinking skills, offers a dynamic classroom environment that surpasses traditional teaching methods. This approach improves subject matter understanding while nurturing essential skills for 21st-century success. The multifaceted benefits range from improved academic performance to enhanced social and communication skills and real-world collaboration preparation:

(1) Cooperative learning enhances academic achievement through active student engagement in discussions, problem-solving, and peer teaching.

(2) Working in groups fosters the development of essential social skills, including effective communication, active listening, and respect for diverse perspectives, which are crucial for personal and professional success.

(3) Cooperative learning stimulates critical thinking and problem-solving, honing analytical skills and promoting creative solutions.

(4) This approach boosts motivation and engagement by creating an inclusive learning environment enhancing students' intrinsic motivation, effort, participation, and commitment to learning.

(5) Preparing students for real-world collaboration and cooperative learning equips them with teamwork skills, an appreciation for diverse perspectives, and the ability to contribute to collective success in collaborative settings.

(6) Students practicing cooperative learning refine their communication skills, including articulation, clarity in expressing ideas, and active listening, which are essential for effective interpersonal relationships and professional success.

(7) Collaborative learning cultivates positive interpersonal relationships by fostering trust, respect, and empathy among students, creating a supportive and inclusive classroom community that enhances overall well-being.

(8) Exposure to diverse perspectives in cooperative learning promotes cultural understanding, empathy, and tolerance, encouraging students to value and respect different viewpoints and contributing to a more inclusive society.

However, the effectiveness of collaborative learning experiences is influenced by various factors that shape the dynamics and outcomes of group interactions:

(1) Diverse group composition is crucial in collaborative learning as heterogeneous groups, with individuals from varied backgrounds and perspectives, tend to outperform homogeneous groups. Diversity encourages cognitive conflict and critical thinking, leading to improved learning outcomes.

(2) Interdependence among group members is essential, particularly in fostering cooperation. Positive interdependence, where learners understand that their success is tied to the group's success, promotes more meaningful interactions and mutual support.

(3) Effective communication and interaction are vital in collaborative learning, as they promote shared knowledge construction. Creating environments that encourage dialogue, discussion, and interaction enables collective learning.

(4) Group dynamics, including cohesion, trust, and leadership, significantly impact collaborative learning. Managing group development stages, such as forming, storming, norming, and performing, is essential. Establishing a positive group climate, resolving conflicts, and promoting shared leadership are crucial for effective collaborative learning.

(5) Thoughtfully designed collaborative learning tasks play a crucial role in shaping interaction levels. Well-structured tasks requiring interdependence, critical thinking, and clear goals enhance the collaborative learning experience and should ensure positive interdependence and individual accountability.

In summary, cooperative learning is a powerful educational approach that promotes collaboration, active participation, and the exchange of diverse ideas among students. This method enhances academic performance and equips learners with crucial skills for the 21st century. Effective cooperative learning hinges on group composition, interdependence, communication, group dynamics, and task design. By recognizing and addressing these elements, educators can create optimal learning environments that empower students and prepare them for a connected world.

3.2. Active Learning

Active learning revolves around an instructional approach that encourages learners to actively engage with the learning process (Grabinger & Dunlap, 1995; Moreno & Mayer, 2000). It emphasizes the active participation of learners in acquiring knowledge, skills, and understanding rather than passively receiving information.

Active learning involves learners taking an active role in their learning by participating in activities promoting critical thinking, problem-solving, and decision-making (Kyoungna, Priya, Susan, & Kevin, 2013; Walker, 2003). Instead of simply listening to lectures or reading textbooks, active learning encourages learners to interact with the material through discussions, group work, hands-on experiments, and other interactive activities. One key aspect of active learning is the shift from a teacher-centered approach to a learner-centered approach. In traditional teaching methods, the teacher is the primary source of knowledge and focuses on transmitting information to the students. In active learning, the teacher becomes a facilitator or guide who supports and encourages the students' active engagement in the learning process (Grabinger & Dunlap, 1995). Active learning is widely recognized for its ability to transform traditional education into a dynamic and engaging experience. By shifting the focus from

passive information absorption to active participation and interaction, active learning offers a multitude of values and benefits for both learners and educators:

(1) Enhanced Engagement: Active learning methods actively involve learners in the learning process, which increases their engagement and motivation.

(2) Deeper Understanding: Active learning promotes a deeper understanding of the subject matter. Instead of passively receiving information, learners actively process and apply knowledge, which leads to better comprehension and retention.

(3) Critical Thinking Skills: Active learning activities stimulate critical thinking skills, such as problem-solving, analysis, and evaluation. By engaging in discussions, debates, and group projects, students learn to think critically, consider multiple perspectives, and develop their own informed opinions.

(4) Collaboration and Communication Skills: Active learning often involves collaboration and teamwork. Through group projects, presentations, and peer discussions, students learn to effectively communicate their ideas, listen to others, and work together towards a common goal.

(5) Application of Knowledge: Active learning encourages applying knowledge in practical contexts. By engaging in hands-on experiments, simulations, and real-world problem-solving activities, learners can directly apply what they have learned to real-life situations.

(6) Adaptability and Lifelong Learning: Active learning fosters adaptability and a lifelong learning mindset. By actively participating in their education, students develop self-directed learning, curiosity, and the ability to seek out and evaluate information independently.

However, active learning is influenced by a variety of factors in classroom dynamics and student engagement, from the classroom environment to the role of the teacher and from student engagement to the availability of resources:

(1) Classroom Environment: The physical and psychological environment of the classroom plays a crucial role in promoting active learning. A supportive and inclusive classroom climate encourages students to actively participate, ask questions, and share their ideas without fear of judgment.

(2) Teacher's Role: The teacher's role is essential in fostering active learning. Teachers who adopt a facilitator or guide role rather than a lecturer encourage students to take ownership of their learning. They provide clear instructions, set learning goals, and offer guidance and support as students engage in activities, discussions, and problem-solving.

(3) Student Engagement: Active learning requires active student engagement. Students who are motivated, curious, and have a sense of agency in their learning are likelier to participate actively. Engaging and relevant learning materials, hands-on activities, real-world applications, and student choice and voice opportunities can enhance student engagement and promote active learning.

(4) Collaboration and Interaction: Collaboration and peer interaction are essential factors in active learning. Group work, discussions, debates, and projects encourage students to share their perspectives, exchange ideas, and learn from each other.

(5) Technology and Resources: Access to technology and relevant resources can significantly impact active learning. Digital tools, multimedia resources, online platforms, and interactive learning materials can enhance student engagement and provide opportunities for active exploration, research, and creation.

(6) Assessment and Feedback: Assessment practices that align with active learning promote student engagement. Formative assessment methods, such as quizzes, discussions, and self-reflection, allow students to monitor their progress and identify areas for improvement.

(7) Cultural and Individual Factors: Cultural and individual factors can influence students' inclination towards active learning. Recognizing and accommodating diverse learning styles, cultural perspectives, and individual differences can support active learning for all students.

In conclusion, active learning represents a transformative approach to education, emphasizing engagement, deeper understanding, critical thinking, collaboration, application of knowledge, and lifelong learning skills. While the effectiveness of active learning is influenced by various factors such as the classroom environment, the teacher's role, student engagement, collaboration, technology, assessment, and individual differences, it remains a powerful pedagogical tool for educators and learners. By recognizing and addressing these factors, educators can create dynamic and inclusive learning environments that empower students to take an active role in their education, fostering a love for learning and preparing them for an ever-evolving world.

3.3. The Relationship between Cooperative and Active Learning

Active learning strongly emphasizes student autonomy and proactivity, while cooperative learning centers on collaboration and interaction among students. These two methods differ in their primary focus but can complement each other to create a more productive learning environment.

As its name implies, active learning underscores the importance of students taking an active and self-directed role in their learning process. It encourages students to select learning materials independently, set their learning objectives, and utilize methods that align with their unique learning styles. Students have the autonomy to choose topics of personal interest, thus often increasing their intrinsic motivation to learn, as they feel a heightened sense of control over their educational journey.

Conversely, cooperative learning enhances student motivation through social interaction and teamwork. In a small group learning setting, students collaborate with peers to solve problems and share perspectives, fostering a sense of social connectedness. This social interaction and teamwork inspire students to become more motivated learners, as they are working towards individual learning goals and contributing to the collective success of the group. Students recognize the weight of their responsibility, knowing that their learning outcomes are closely tied to the group's performance. When these two methods are combined, students can simultaneously harness their interests and gain social support. They can autonomously select learning materials while receiving peer feedback and support within the collaborative group. This combination elevates student motivation as they can pursue their interests while experiencing the social connections that group work offers. Students have individual and group objectives, creating a dual motivational mechanism that enhances their enthusiasm for learning.

Furthermore, these two methods are well-suited to cater to the diverse needs of different types of students. Some students lean towards independent learning, enjoying the autonomy to determine their learning methods and pace. Active learning provides an ideal environment for these students. Others may gravitate towards social interaction, finding fulfillment in learning with peers within a group. Cooperative learning meets the needs of these students by emphasizing teamwork and shared learning experiences. By amalgamating these two approaches, educators can establish a more inclusive learning environment that caters to the varying requirements of students and helps them realize their full potential. On the academic front, integrating active and cooperative learning can elevate academic achievement. Active learning encourages students to engage in deep thinking and independent research, resulting in a more profound understanding of the subject. Through group discussions and collective problem-solving, cooperative learning promotes knowledge sharing and multifaceted thinking, enhancing academic performance. Students can accumulate knowledge through individual learning and share and discuss their ideas within the group, providing a more comprehensive learning experience. This comprehensive approach enriches their comprehension of the learning content and ultimately bolsters their academic performance.

In summary, active learning and cooperative learning, despite differing in focus, serve to complement each other in the realms of enhancing student motivation, catering to diverse learning needs, and fostering academic achievement. These methodologies offer distinct yet mutually reinforcing learning experiences, cultivating students' self-directed learning skills, social skills, and academic accomplishments. By incorporating these two methods into educational practice, educators can provide students with a more comprehensive and well-rounded learning experience, thus laying a solid foundation for their future educational and career development.

4. Feasibility in Vocational Education

4.1. Addressing the Practical Issues

In modern society, vocational education has gained significant importance as it focuses on cultivating students' skills, knowledge, and abilities essential for success in specific professional fields. This form of education imparts subject knowledge and emphasizes problem-solving skills and autonomy. Collaborative and active learning methods have emerged as powerful educational tools to foster students' cooperation, problem-solving abilities, and independence, all essential in their professional domains. Collaborative learning emphasizes teamwork and problem-solving, while active learning encourages autonomy and adaptability. These methods offer a comprehensive vocational education, preparing students for career success.

4.2. Enhancing Learning Achievement

Academic performance is the primary focus in education, with educators and students constantly seeking practical approaches to enrich learning experiences and boost achievements. Collaborative and active learning are two such methods. Collaborative learning enhances academic performance by encouraging knowledge sharing, group discussions, and multidimensional thinking. In comparison, active learning promotes deep reflection and independent research with similar objectives. Collaborative learning provides a rich social environment for students to broaden their academic perspectives through interaction and knowledge sharing. Active learning takes this further by encouraging profound contemplation and independent investigation. This combination enhances multiple understandings of academic content and cultivates the depth and breadth of knowledge, contributing to holistic student development and improved academic performance.

Furthermore, this integration enhances students' academic self-confidence. In collaborative learning, students validate their comprehension through interaction and knowledge sharing, boosting their confidence in academic discussions and exploration. Active learning deepens their knowledge, promotes independent problem-solving, and further reinforces their academic self-confidence. This approach fosters a belief in their ability to engage in profound academic thinking and independent research, which is essential for enhancing academic performance.

4.3. Enhancing Self-Motivation

The fusion of collaborative and active learning creates a dual motivation mechanism that benefits students. Collaborative learning fosters social interaction and support, stimulating social responsibility and academic curiosity. Simultaneously, active learning promotes autonomy and independent research, nurturing academic self-confidence and the belief in facing academic challenges.

In collaborative learning, group projects and teamwork transform students into an integral part of a learning community. They collaborate to solve problems, share perspectives, and exchange resources, fostering close social connections. This interaction and support reduce academic pressure, increase learning enjoyment, and encourage active participation. Students in collaborative learning take on various roles and work towards common academic goals, understanding their responsibility towards the group's success. This sense of responsibility boosts their intrinsic motivation, extending beyond individual academics to teamwork and social connections. This social responsibility motivates them to pursue academic success proactively. On the other hand, active learning emphasizes autonomy. Students independently select materials, set objectives, and employ methods that suit their learning style. This autonomy turns students into self-directed learners who manage their learning processes. Active learning encourages profound, critical thinking, stimulating academic curiosity for in-depth knowledge. It pushes students to explore topics deeply, enhancing academic performance. Additionally, active learning nurtures students' problem-solving skills, enhancing academic self-confidence. They develop a resilient mindset, reducing their tendency to give up and positively influencing academic success.

5. Challenges from Limited Resources and Educator Resistance

Limited resources pose a significant challenge. The constraints on educational funding directly impact collaborative and active learning implementation. These methods typically require more investment, encompassing support for group learning, practical projects, and technical equipment. However, due to the restricted funding, educational institutions need help to provide sufficient resources, thus constraining the application of these methods. More teaching staff is also a concern since these methods demand increased teacher involvement, and

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some institutions may need help hiring an adequate number of educators with relevant experience and training. Furthermore, more technical equipment is needed to improve students' learning experiences, particularly in resource-deprived areas. Furthermore, resistance from educators presents a challenge. This resistance may stem from traditional educational ideologies, as some educators believe that collaborative learning and active learning contradict their prior educational experiences and methods, leading to skepticism. Implementing these methods necessitates educators acquiring new educational skills and knowledge, but training requires time and resources, and some teachers may be reluctant to alter their teaching approaches. Additionally, these methods introduce new challenges in student assessment and evaluation, as they emphasize student participation and self-directed learning, which differs from traditional examinations and tests.

In summary, successfully implementing collaborative and active learning in vocational institutions requires addressing two key challenges: limited resources and educator resistance. This involves increasing educational funding, providing teacher training and support, reevaluating student assessment methods, and conducting further research to substantiate the positive impact of these methods on student learning. These methods can only fully realize their potential and provide a higher quality education by overcoming these challenges.

6. Conclusion

In conclusion, the fusion of collaborative and active learning methodologies presents a promising approach to enhance vocational education. These methods offer a multifaceted approach to improving learning achievement and self-motivation among vocational students. Collaborative learning nurtures teamwork, problem-solving skills, and a sense of social responsibility, fostering an environment conducive to heightened motivation for learning. On the other hand, active learning emphasizes autonomy, deep understanding, and critical thinking, empowering students to become self-directed learners with increased academic self-confidence. This combination provides a comprehensive foundation for academic excellence and lifelong learning skills essential for career success.

However, the practical implementation of collaborative and active learning faces challenges, primarily stemming from limited resources and educator resistance. Limited funding restricts the availability of necessary resources and technical equipment, while insufficient teaching staff can hinder the adoption of these methods. Educator resistance, rooted in traditional educational ideologies, necessitates training and support to embrace the new approach. Furthermore, the shift in student assessment and evaluation methods raises concerns among educators. To fully realize the potential of collaborative and active learning in vocational education, it is imperative to address these challenges. This entails increasing educational funding, providing comprehensive teacher training and support, reevaluating assessment methods, and conducting further research to substantiate the benefits of these methods. Only through a concerted effort to overcome these obstacles can vocational education truly harness the transformative power of collaborative and active learning, providing students with the skills and motivation necessary for success in their chosen professions.

References

AbuSeileek, A. F. (2012). The effect of computer-assisted cooperative learning methods and group size on the EFL learners' achievement in communication skills. *Computers & Education, 58*(1), 231-239. https://doi.org/10.1016/j.compedu.2011.07.011

European Commission. (2012). *Developing key competences at school in Europe challenges and opportunities for policy*. Retrieved from https://www.orientamentoirreer.it/sites/default/files/norme/UE%20092%202012%20EURYDICE%20key%20competences%20n ovembre.pdf

Grabinger, R. S., & Dunlap, J. C. (1995). Rich environments for active learning: A definition. *Research in Learning Technology, 3*(2), 5-34. https://doi.org/10.1080/0968776950030202

Kivunja, C. (2014). Do you want your students to be job-ready with 21st century skills? Change pedagogies: A pedagogical paradigm shift from vygotskyian social constructivism to critical thinking, problem solving and siemens' digital connectivism. *International Journal of Higher Education, 3*(3), 81-91. https://doi.org/10.5430/ijhe.v3n3p81

Kyoungna, K., Priya, S, Susan, M. L., & Kevin, P. F. (2013). Effects of active learning on enhancing student critical thinking in an undergraduate general science course. *Innovative Higher Education, 38*, 223-235. https://doi.org/10.1007/s10755-012-9236-x

Laal, M. (2012). Collaborative learning: What is it? *Procedia-Social and Behavioral Sciences, 31*, 491-495. https://doi.org/10.1016/j.sbspro.2011.12.092

Moreno, R., & Mayer, R. E. (2000). Engaging students in active learning: The case for personalized multimedia messages. *Journal of Educational Psychology, 92*(4), 724-733. https://doi.org/10.1037/0022-0663.92.4.724

Nam, C. W., & Zellner, R. D. (2011). The relative effects of positive interdependence and group processing on student achievement and attitude in online cooperative learning. *Computers & Education, 56*(3), 680-688. https://doi.org/10.1016/j.compedu.2010.10.010

Sekwena, G. L. (2023). Active learning pedagogy for enriching economics students' higher order thinking skills. *International Journal of Learning, Teaching and Educational Research, 22*(3), 241-255. https://doi.org/10.26803/ijlter.22.3.15

Smith, K. A. (1996). Cooperative learning: Making "groupwork" work in C. Bonwell & T. Sutherlund, Eds., Active learning: Lessons from practice and emerging issues. *New Directions for Teaching and Learning, 67*, 71-82. https://doi.org/10.1002/tl.37219966709

Tang, T. (2020). Developing critical thinking, collective creativity skills and problem solving through playful design jams. *Thinking Skills and Creativity, 37*, 100696. https://doi.org/10.1016/j.tsc.2020.100696

UNESCO, E. (2015). *2030—incheon declaration and framework for action*. Pars: UNESCO.

Walker, S. (2003). Active learning strategies to promote critical thinking. *Journal of Athletic Training, 38*(3), 263-267.