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Analysis of the Current Situation of College Students' Safety Education and Research on Blended Teaching Reform

Jian Xiao*, Mengli Zhu

Jingjiang College, Jiangsu University, Zhenjiang 212000, China

**Author to whom correspondence should be addressed.*

Abstract: College students' safety education is an important part of the fundamental task of fostering virtue through education in colleges and universities. A questionnaire survey at J University shows that the popularization degree and teaching satisfaction of college students' safety education are relatively high, but the teaching content and teaching forms still need improvement. With the rapid development of artificial intelligence technology and considering the char-acteristics of college students' online learning in the new era, carrying out the SPOC + PBL blended teaching reform not only helps to enhance the effectiveness of theoretical and practical teaching but also contributes to optimizing the teach-ing evaluation and feedback mechanism and strengthening students' problem-solving abilities. Therefore, we should adhere to the goal orientation, meticulously design the teaching plan, highlight the student-centered approach, focus on integrating teaching resources, strengthen process management, promptly provide feedback and guidance, empower with data, and continuously improve teaching evaluation. Thus, a student-centered SPOC + PBL blended teaching sys-tem can be constructed to empower the transformation and innovation of talent cultivation in higher education.

Keywords: Safety education; SPOC; PBL; Blended teaching; Teaching reform

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1. Introduction

College students' safety education is not only an important part of their quality education but also an essential part of ideological and political education in colleges and universities. The *Report of the 20th National Congress of the Communist Party of China* emphasizes that national security is the foundation of national rejuvenation, and social stability is the prerequisite for national prosperity [1]. It is necessary to comprehensively strengthen national security education and enhance the awareness and quality of national security among all people [2]. The *Guidelines for National Security Education in Primary, Secondary, and Tertiary Schools* issued by the Ministry of Education clearly stipulate that a public basic course on national security education should be offered, and safety education integrated into the education and teaching of various disciplines and majors. As a gathering

place for high-level talents in society, the school-running level of colleges and universities not only determines the future development of students but also influences the social development level. With the accelerated advancement of the interdisciplinary integration of "artificial intelligence +" and "big data +," it will inevitably give birth to a new paradigm of talent cultivation. This year, the Ministry of Education specifically launched the Artificial Intelligence Empowering Education Initiative, encouraging teachers and students to learn AI, supporting personalized lifelong learning for all people, and promoting the integrated application of teaching and learning. Therefore, starting from the current situation of college students' safety education and based on the needs of cultivating new era talents, we should fully recognize the significance of the blended teaching reform of college students' safety education in the process of talent cultivation in the new era. We should accelerate the construction of a student-centered SPOC + PBL blended teaching system to empower the improvement of the quality of education and teaching in colleges and universities and the cultivation of innovative talents.

2. Analysis of the current teaching situation of college students' safety education

To understand the current teaching situation of safety education at J University, a questionnaire survey was conducted among 228 students from different disciplines such as engineering, science, and management. This questionnaire survey mainly covered the basic situation of college students, their awareness of safety education, the cycle, main content, and teaching forms of the safety education courses, their satisfaction with the content and teaching forms of safety education, and how the school can improve safety education. The survey results show that college students have a relatively strong awareness of safety education, and most students have received safety education from the school, with relatively high popularity. The satisfaction with teachers' teaching ability, teaching content, teaching forms, and assessment forms is relatively high. Students expect the school to further improve the teaching content and forms of safety education and show a strong interest in the online and offline blended teaching reform.

2.1. High popularity of college students' safety education

In terms of safety awareness (**Table 1**), 86.41% of the students believe that the current safety awareness level of college students is relatively high, and 92.10% of the respondents consider their own safety awareness level high. Regarding the acceptance of safety education, 82.01% of the students are willing to participate in the safety education activities organized by the school, and 93.42% of the students have participated in safety education activities organized by the school at the beginning of the semester or during normal times. Overall, the school attaches great importance to the safety education of college students. Through various online and offline forms such as safety education courses, special lectures, dedicated practices, and film and television resources, safety education, including life and health safety education, network safety education, and national security education, has been carried out. The popularity of college students' safety education is relatively high.

Table 1. Statistics table on the survey of college students' safety education related situations

Question	Answer			
1. Do you think college students generally have a high degree of safety awareness?	A. Very high	B. Comparatively high	C. Not too high	D. Almost none
	38.60%	47.81%	11.40%	2.19%
2. Do you think your own safety awareness is high?	A. Very high	B. Comparatively high	C. Not too high	D. Almost none
	52.63%	39.47%	4.82%	3.07%
3. Will you participate in the safety education activities organized by the school?	A. Will take the initiative to participate	B. Will be passively involved	C. Indeterminacy	D. Non-participation
	64.47%	17.54%	12.72%	5.26%
4. When did you receive safety education in school?	A. At the beginning of the semester	B. In normal times	C. The end of a semester	D. Not have
	54.82%	79.82%	33.33%	6.58%
5. What forms of safety education are carried out in your school?	A. Special safety education classroom teaching	B. A course of lectures	C. Exercises/ practical activities	D. Watch video materials
	79.82%	78.07%	58.33%	59.65%
	E. Class meeting	F. Online video	G. Other	
	66.23%	47.81%	26.75%	
6. What is the content of safety education in your school?	A. Life, health, and safety education	B. Mental health safety education	C. Cybersecurity education	D. National security education
	93.42%	92.54%	84.65%	78.07%
	E. Property, health, traffic, and other safety education			
	70.18%			

2.2. High satisfaction with college students' safety education teaching

In terms of teachers' teaching ability (**Table 2**), the satisfaction rate is as high as 97.81%. Regarding the teaching content, the satisfaction rate reaches 97.37%. For the teaching form, the satisfaction rate is 97.37%, and for the assessment form, the satisfaction rate is also 97.37%. Overall, students' satisfaction with the school's safety education reaches 96.93%, laying a solid foundation for the school to further improve the quality of education and teaching.

Table 2. Statistical table on college students' satisfaction with school safety education

Question	Answer			
7. Are you satisfied with the teaching ability of the teachers who teach the safety education course in your school?	A. Very satisfactory	B. More satisfactory	C. Less satisfactory	D. Unsatisfactory
	72.37%	25.44%	1.75%	0.44%
8. Are you satisfied with the teaching content of school safety education course?	A. Very satisfactory	B. More satisfactory	C. Less satisfactory	D. Unsatisfactory
	71.93%	25.44%	1.32%	1.32%
9. Are you satisfied with the teaching form of school safety education course?	A. Very satisfactory	B. More satisfactory	C. Less satisfactory	D. Unsatisfactory
	71.49%	25.88%	1.75%	0.88%
10. Are you satisfied with the assessment form of school safety education course?	A. Very satisfactory	B. More satisfactory	C. Less satisfactory	D. Unsatisfactory
	69.74%	27.63%	1.75%	0.88%
11. What is your overall feeling about the safety education carried out by the school?	A. Very good	B. Better	C. Not so good	D. No effect
	68.42%	28.51%	1.75%	1.32%

2.3. Need for improvement in the teaching content and form of college students' safety education

Regarding the improvement of safety education (**Table 3**), 51.32% of the students hope to improve the teaching form, 49.12% of the students hope to improve the teaching content, and 32.46% of the students hope that the course assessment can be improved. In terms of blended teaching, 87.72% of the students have an understanding of online and offline blended teaching, 94.73% of the students believe that blended teaching is of great help in improving the effectiveness of safety education teaching, and 90.79% of the students are willing to participate in the blended teaching reform of safety education courses.

Table 3. Statistical table of the survey on college students' views on the improvement of school safety education and blended teaching

Question	Answer			
12. In your opinion, what aspects should be improved in school safety education?	A. Content of courses	B. Instructional mode	C. Teachers	D. Course assessment
	49.12%	51.32%	21.05%	32.46%
	E. Other			
	36.4%			
13. Do you understand the online + offline hybrid teaching?	A. Very well understood	B. Comparative understanding	C. Not quite	D. Not known
	48.25%	39.47%	9.65%	2.63%
14. Do you think the combination of online and offline teaching is helpful to improve the effect of safety education?	A. Very large	B. Comparatively large	C. Not quite	D. Almost none
	57.89%	36.84%	3.07%	2.19%
15. Are you willing to participate in the school's online + offline blended safety education course?	A. Very willing	B. More willing	C. Less willing	D. Unwillingness
	59.21%	31.58%	4.39%	4.82%

3. The significance of the SPOC + PBL blended teaching reform in college students' safety education

College students' safety education is a cross-disciplinary and highly comprehensive course. The traditional teaching model of this course often focuses on the imparting of theoretical knowledge, while neglecting the cultivation of students' practical operation ability and problem-solving ability. In this mode, students often find it difficult to apply the learned knowledge to practical situations and form effective emergency safety management capabilities. SPOC (Small Private Online Course) realizes the sharing of high-quality teaching resources and the customization of personalized learning paths through an online platform, which helps to improve students' autonomous learning ability and learning effectiveness. The PBL (Problem-Based Learning) model emphasizes taking problems as the core and cultivating students' innovative thinking and problem-solving ability through group cooperation, discussion, and exploration. Carrying out the SPOC + PBL blended teaching reform can not only share high-quality teaching resources from well-known universities but also promote the in-depth integration of online and offline, theory and practice, which has important practical significance for promoting the improvement of the teaching quality of college students' safety education.

3.1. Improving the effectiveness of the comprehensive practical teaching of the course

In traditional courses, the resources and activities provided by teachers often limit the boundaries of knowledge exploration [3]. What learners learn and how they learn are both pre-planned. Students often focus on classroom theoretical knowledge learning and neglect comprehensive practical applications. In the SPOC + PBL blended teaching, students can deeply learn theoretical knowledge through the online platform and, under the guidance of teachers, conduct practical operations in combination with specific cases or simulated scenarios. For example, in a simulated fire emergency drill, students need to use the learned theoretical knowledge to formulate evacuation plans, organize personnel evacuation, and continuously adjust and optimize the plans during the drill. Such comprehensive practical operations enable students to understand and master the comprehensive knowledge of safety education and emergency management more deeply and improve the effectiveness of the comprehensive practical teaching of the course.

3.2. Optimizing the teaching quality evaluation and feedback mechanism

Teaching evaluation is the process in which the evaluation subject makes objective, scientific, fair, and just value judgments on the teaching state, process, and results according to the corresponding evaluation standards [4]. The SPOC + PBL blended teaching makes teaching evaluation more diversified and the evaluation results more comprehensive. In addition to traditional written tests and homework evaluations, teachers can also evaluate students from multiple aspects, such as their learning performance on the online platform, participation in discussions, and practical operation results. At the same time, students can also conduct self-evaluation and peer evaluation through the online platform to timely understand their learning situation and deficiencies, which helps teachers better understand students' learning conditions and make targeted teaching adjustments.

3.3. Strengthening students' ability to solve safety problems

The Organization for Economic Cooperation and Development (OECD) includes complex problem-solving ability as one of the core competencies required for "future citizens" in the theoretical framework of 21st-century core competencies and incorporates it into the evaluation system of the Program for International Student Assessment (PISA) [5]. It can be said that complex problem-solving ability has become a key essential competency for high-quality innovative talents in the new era and a core essential competency for outstanding applied talents. The SPOC + PBL blended teaching adheres to the problem orientation. Under the guidance of teachers, students conduct autonomous learning and cooperative exploration around actual problems. For example, teachers can design some real safety education problems or emergency events, such as chemical plant leakage accidents and earthquake disasters, for students to analyze and solve. In the process of solving problems, students not only need to consult a large amount of information, conduct group discussions, and formulate solutions, but also verify the feasibility of the solutions through simulation drills or experiments. This not only exercises students' comprehensive problem-solving ability but also cultivates their innovative thinking and teamwork ability.

4. The SPOC + PBL blended teaching reform strategy for college students' safety education with the student as the center

Students are the main body of classroom teaching activities. The all-round development of students is the center and starting point of education, and also the purpose and destination of education. The value rationality basis of the education system should point to the liberation and freedom of people and should serve to expand people's

educational freedom and promote their free development [6]. With the rapid development of new-generation information technology, "enabling all students to learn high-quality educational resources anytime and anywhere" has become an important goal of education and teaching reform in the new era. Standing at a new stage, we should adhere to the student-centered approach, take promoting the all-round development of students as the main line, accelerate the construction and sharing of high-quality online teaching resources, carry out SPOC + PBL blended teaching reform, and comprehensively enhance students' development competitiveness and internal motivation.

4.1. Adhering to the goal orientation and meticulously designing the teaching plan

The OBE education concept follows the principle of "reverse design, forward implementation." Starting from the needs of society and industries, the school's positioning, professional characteristics, and student development, the professional training goals are determined. Then, the graduation requirements are designed based on the training goals and decomposed into various courses to construct the curriculum system and form the relationship matrix between the curriculum system and the support of the graduation requirements [7]. Teachers should implement the OBE education concept, conduct in-depth analysis of the college students' safety education course, and carefully design and integrate teaching resources according to the teaching goals and content, including teaching videos, cases, online tests, etc., to ensure the richness and effectiveness of online teaching resources. Teachers also need to organically combine online resources with offline teaching content to form a complete teaching system, ensuring that students can obtain coherent and systematic knowledge throughout the learning process. In terms of course objectives, we are committed to enabling students to master the basic theories and practical skills of safety and emergency management, be able to analyze and solve practical problems using the learned knowledge, and at the same time, through cultivating students' teamwork spirit and innovative awareness, enhance their communication and organization and coordination abilities to meet the needs of society for safety and emergency management talents.

4.2. Highlighting the student-centered approach and focusing on integrating teaching resources

The SPOC + PBL model requires the effective combination of online autonomous learning and offline problem-oriented learning, but in actual operation, how to ensure the integration of the two is a challenge. Online learning can easily make students feel isolated, while offline learning may be limited by time and place. Teachers need to design challenging and inspiring problems or projects according to the curriculum content and students' actual situations, provide rich teaching resources through online teaching platforms, and stimulate students' learning interest and exploration desire. Teachers should also actively participate in the construction of learning communities, regularly release course dynamics, learning guidance, etc. Under the guidance of teachers, students carry out autonomous learning, cooperative learning, and inquiry learning around problems and master knowledge and skills by solving problems or completing projects. On the SPOC platform, teachers can establish course learning communities, encourage communication and cooperation among students, share learning experiences, and form learning communities. Offline, through problem-oriented learning, students can carry out discussions and practical operations around practical problems under the guidance of teachers, achieving the organic combination of theory and practice.

4.3. Strengthening process management and providing timely feedback and guidance

The SPOC + PBL model requires a high level of learning autonomy and collaboration from students. However, in practice, balancing these two aspects poses a challenge: excessive autonomy may lead some students to lack direction, while overemphasis on collaboration may obscure individual differences and shortcomings. Teachers should conduct real-time monitoring and management of students' learning processes, using online tests and assignment submissions to track progress and effectiveness.

In terms of teaching links, we emphasize close coordination between online and offline activities. The online phase includes autonomous learning, online testing, and interactive discussions to ensure students master basic knowledge and theories. The offline phase involves classroom discussions, case analysis, and simulation drills to enhance practical skills and problem-solving abilities. Meanwhile, teachers should establish a diversified evaluation system, incorporating online learning performance, offline practical achievements, and team collaboration to ensure fairness and objectivity in evaluation.

Teachers must promptly provide feedback on students' online questions and assignments, address doubts, and help solve problems. Based on individual learning conditions, personalized learning suggestions and guidance should be provided to assist students in formulating suitable study plans and improving learning outcomes.

4.4. Enhancing data empowerment and continuously improving teaching evaluation

Classroom teaching quality evaluation is a process of judging, mining, and enhancing the value of specific teaching activities [8]. Traditional evaluation methods often rely on attendance, homework, and exams, focusing on outcomes while ignoring problems in personalized learning and the analysis of learning effectiveness. Such methods fail to fully reflect students' actual learning conditions and mastery of course objectives. Conversely, overly complex evaluation methods may impose excessive burdens on students and teachers, increasing the difficulty of teaching management.

To address this, we should further strengthen the analysis of SPOC + PBL learning data. By integrating big data on students' online learning performance, offline practical achievements, and team collaboration, we can build a diversified evaluation system that combines AI autonomous evaluation with mutual evaluation among students and teachers. This approach helps us better understand students' learning status and effects, providing continuous data support for the sustainable improvement of education and teaching.

5. Future outlook

Technological revolutions in information technology, biotechnology, artificial intelligence, and other fields have made knowledge acquisition more accessible. According to relevant surveys, human knowledge doubles every 2–3 years. Blended teaching, which organically combines traditional offline classroom teaching with online network teaching, has gained widespread attention and application due to its ability to integrate the advantages of both modes—breaking time and space constraints, enhancing teacher-student communication, promoting teamwork and deep learning, and achieving a "1+1>2" teaching effect [9]. Looking to the future, we need to further deepen the blended teaching reform in college students' safety education:

Continuously improving the integration of online and offline teaching: Carefully design teaching links for both phases to ensure smooth transition and complementarity. Leverage modern technology to enhance student engagement and interactivity in online learning.

Scientifically designing the difficulty and guidance of teaching problems: Gain a deep understanding of

students' actual conditions and learning needs. Develop hierarchical and guiding questions that combine course content with real-world scenarios, providing timely guidance based on student feedback.

Coordinating the balance between autonomous and collaborative learning: Improve learning objectives and task requirements, offer diverse learning resources and support, guide students to plan their study schedules reasonably, encourage communication and collaboration, and recognize individual performance and contributions.

Strengthening the effectiveness of teaching evaluation and feedback: Design reasonable evaluation indicators and systems. Utilize modern technologies such as big data analysis and intelligent assessment to improve the accuracy and efficiency of evaluation, and provide targeted guidance to help students continuously refine learning methods and enhance academic performance.

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