Adult and Higher Education (2024)
Clausius Scientific Press, Canada

DOI: 10.23977/aduhe.2024.060115
ISSN 2523-5826 Vol. 6 Num. 1

The Value and Optimization Strategies of Integrating Curriculum Civics into Physical Education in Colleges and Universities

Ma Jiajia

Hangzhou Medical College, Hangzhou, Zhejiang, 310000, China

Keywords: Curriculum civic politics; index system; machine learning; comprehensive literacy; association rule mining

Abstract: In order to more comprehensively understand the effect of integrating curriculum ideology and politics in college physical education, a comprehensive student assessment system is formed by constructing a comprehensive index system that takes into account various factors such as students' physical and mental health, ideological and moral quality, and comprehensive literacy. Second, the student comprehensive literacy assessment algorithm adopts machine learning modeling to predict the overall comprehensive literacy level of students by combining factors such as academic performance, physical exercise and teamwork. Finally, in order to optimize the curriculum design, association rule mining was used to analyze the relationship between subject content and Civics elements. The results show that the average participation rate of the sports course integrating Civic Politics is 89.5%, and the students' comprehensive literacy improves about 2.6% after integrating Civic Politics, which verifies the feasibility of the proposed method.

1. Introduction

Physical education, as an important part of higher education, is significant not only for cultivating students' physical quality, but also for promoting their overall literacy [1]. In the context of the new era, the integration of curriculum politics into physical education in colleges and universities has far-reaching value and positive social significance [2]. The integration of Curriculum Civics into physical education helps to shape a healthy and upward student style, and cultivate students' positive human attitudes by emphasizing the Civics elements such as sportsmanship, teamwork, and fair competition, so that they can obtain physical and mental health in physical exercise while integrating the socialist core values and shaping a positive character [3]. Physical education in colleges and universities is not only the teaching of skills, but should also pay attention to students' ideological, moral and cultural literacy. By guiding students to think about life and accumulate teamwork experience in sports activities, curriculum ideology can help students grow more comprehensively and cultivate comprehensive quality [4].

Mcguffog, R et al. showed that tertiary students of lower social class tended to perform less well in terms of health, exploring the mediating role of sleep in this, conducting three studies including online survey responses from 628, 376 and 446 students from large Australian universities,

universities in Ireland, and a large Australian Institute of Technology, respectively [5].Lynch, S et al. stated that Higher education, physical education provides students with the opportunity to develop meaning and value for their sporting experiences. However, this is a less researched area in the field of education, aiming to explore what college students find meaningful in physical education [6].Serra, P. et al. selected 4,146 students from 39 schools in three regions of Spain, 50.2% of whom were female, with a mean age of 16.82 years and a standard deviation of 0.837, and examined the physical education and sport science in Spanish gender social representations in higher education [7].Garc á-Rico, L et al. In order to understand the contribution of service learning to the improvement of Physical Education Teacher Education (PETE) programs, as well as to the awareness and sensitivity to the Sustainable Development Goals (SDGs). A qualitative approach was used, with an ethnographic-hermeneutic methodology for the case study design. The study population consisted of 81 senior students majoring in Physical Education Teacher Education. Techniques and tools such as non-participant observation, student portfolios, focus groups and group interviews were used in the information collection process [8].O'Brien, W et al. used an inductive cross-analysis with a sample of representatives of Physical Education Teacher Education from five European Higher Education Institutions (HEIs) through a deductive structure of the PETE program, PETE staff, and PETE students SWOT examination. The results showed that each PETE program struggles with important tensions between the experiential nature of physical education as a discipline due to institutional and external constraints on online and blended teaching methods [9].Shukurov, R. S presented a study of the pedagogical conditions for attracting students to physical education and sport, for assimilating and developing the concepts of a culture of healthy living, possibilities of physical education and sport and its effectiveness, mentioning the technical conditions of organizing a targeted teaching process [10].

Although the above literature covers some basic concepts and methods of integrating curriculum ideology into physical education in higher education, there are some shortcomings. Firstly, too much emphasis has been placed on the positive impact of Curriculum Civics on students' physical and mental health and socialist core values, while relatively little research has been done on the specific implementation and evaluation of its effects. Secondly, the differences and individualization of physical education courses in different types of colleges and universities, different majors, and different regions in the integration of Civic Governance in the curriculum have not been thoroughly explored. This paper mainly focuses on the specific practice and optimization strategies of the Civic Politics of Curriculum in physical education in colleges and universities, so as to make physical education teaching more in-depth and practical.

2. Value Assessment and Optimization Strategy Model

2.1 Value assessment model

The integration of curriculum ideology in college physical education requires the establishment of a comprehensive model to assess its value and provide corresponding optimization strategies [11]. When assessing the value, multiple aspects of students must be considered comprehensively, including physical and mental health, ideological and moral quality, and comprehensive literacy. These three aspects cover the development of individual students' physical condition, moral character, and broad literacy, thus providing a comprehensive and in-depth perspective for comprehensive assessment. To describe this comprehensive assessment process more specifically, the following formula is used:

$$VI = w_h \times H + w_m \times M + w_c \times C \tag{1}$$

In the above formula, VI represents the comprehensive assessment index and H represents the overall value level. represents the physical and mental health index, and M reflects the physical state and health level of students. C represents the ideological and moral quality index, which is used to measure students' character and moral values. w_h、w_m、w_c represents the comprehensive literacy index, which covers students' broad literacy and comprehensive ability [12]. Separate weights for physical and mental health, ideological and moral quality and comprehensive literacy are used to balance the importance of each aspect in the overall assessment [13].

2.2 Assessment of students' comprehensive literacy

Students' comprehensive literacy is one of the key indicators for assessing the value of machine learning modeling to predict the level of students' comprehensive literacy, taking into account factors such as academic performance, physical exercise performance and teamwork performance. The calculation is as follows:

$$CL = \beta_0 + \sum_{i=1}^{3} \beta_i \times F_i \tag{2}$$

CL denotes the student's level of general literacy, β_0 is the intercept term of the model representing the base level of general literacy when other factors are not taken into account. β_i is the coefficient of each factor, which denotes the weight of influence of academic performance, physical activity performance, and teamwork performance, respectively. F_i is the specific value of each factor.

2.3 Curriculum design optimization

In order to better optimize the curriculum design, association rule mining has become a key task whose goal is to analyze the relationship between subject content and Civic and Political elements in order to provide targeted optimization strategies [14]. It not only helps to integrate the Civic and Political elements more effectively, but also enables the physical education curriculum to be closer to the goal of comprehensive quality education. The establishment of association rule mining as

$$AD = \frac{Support}{Confidence} \tag{3}$$

AD represents the degree of association between the subject content and the Civic and political elements, $Support$ represents the support degree, which indicates the number of times the Civic and political elements are simultaneously included in the subject content. $Confidence$ represents the confidence degree, which indicates the probability that the subject content also exists at the same time in the case of the inclusion of the Civic and political elements [15]. By analyzing the degree of association, it can provide guidance for curriculum design and help adjust the content structure, so that the Civic and political elements can be more organically integrated into physical education and enhance the comprehensive educational effect [16].

2.4 Model Construction

Through these correlations, the effect of integrating Curriculum Civics in physical education courses is comprehensively assessed and corresponding optimization strategies are provided.Figure 1 shows the model framework, which provides a scientific and systematic method for integrating Curriculum Civics in physical education in colleges and universities.

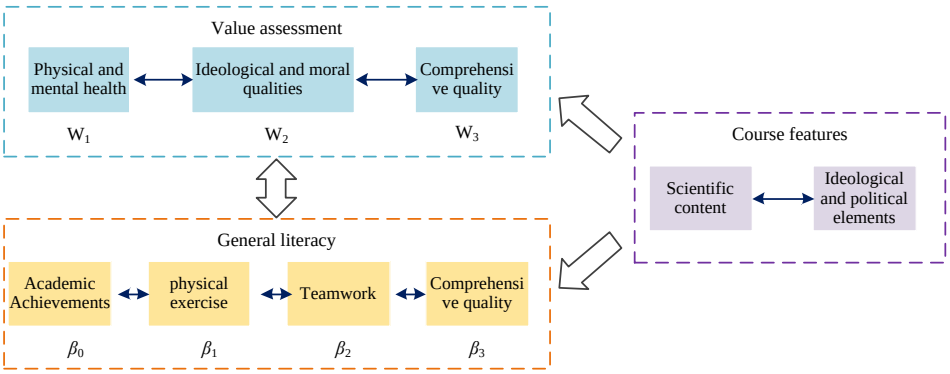

Figure 1: The model framework

3. Results and Discussion

3.1 Analysis of Academic Performance

The academic performance was assessed whether academic performance was affected by comparing the performance of students integrated into the course Civics with the performance of students in the traditional physical education course. The academic performance, depicted in Figure 2, exhibited improvement in the physical education course incorporating Civics compared to the traditional physical education course. On average, the students' performance in the physical education courses integrated with Civics was slightly higher than that in the traditional physical education courses. The average grade in the traditional physical education course was 82.8, and the average grade in the physical education course integrated with Civics was 86.7, which was an improvement of almost 4.7% in student performance.

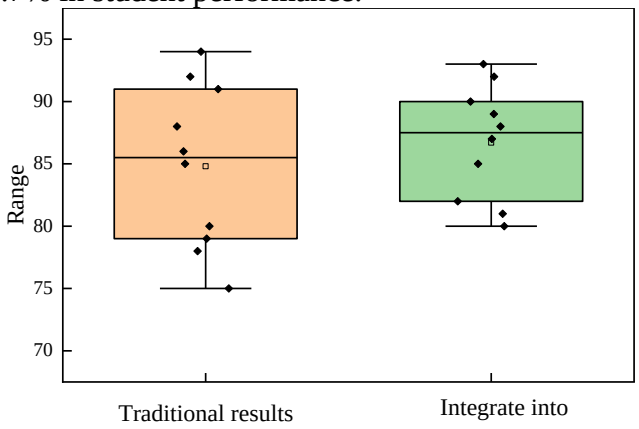

Figure 2: Academic performance

3.2 Assessment of students' comprehensive literacy

In order to gain a deeper understanding of the differences between physical education integrated with Civics and traditional physical education in terms of subject knowledge and comprehensive literacy, a multi-dimensional examination of subject knowledge and comprehensive literacy was conducted with the aim of exploring whether the integration of Civics elements produced a significant difference in these two aspects. Students' comprehensive literacy scores are shown in Figure 3, with an average comprehensive literacy score of 89.4 for the Civic Governance-integrated physical education course and 87.1 for the traditional physical education course, with an increase in

comprehensive literacy of about 2.6%, and in the Civic Governance-integrated physical education, not only did students' academic performance improve, but their comprehensive literacy scores likewise increased.

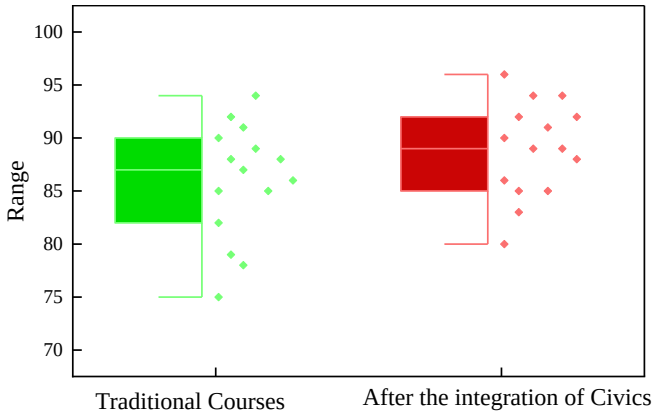

Figure 3: Comprehensive student literacy scores

3.3 Student Participation

In order to comprehensively understand the impact of physical education integrated into the curriculum of Civics on students, special attention was paid to the students' participation, Table 1 shows the students' participation, including the performance of classroom activities, discussions and teamwork. The average participation in physical education courses integrated into the Civics was 89.5%, the average participation in traditional physical education courses was 79.6%, and the average participation in other courses in the control group was 80.6%, and the participation in physical education courses integrated into the Civics increased by 12.4%. In physical education integrated with Civics, students' participation increased relative to traditional physical education courses.

Table 1: Student Engagement

Student Number	Traditional Physical Education Course Participation	Integration of Civics Physical Education Course Participation	Participation in other courses of the control group
1	75%	90%	80%
2	80%	85%	75%
3	70%	92%	78%
4	82%	88%	81%
5	78%	91%	79%
6	85%	89%	83%
7	88%	94%	87%
8	76%	87%	78%
9	79%	86%	80%
10	83%	93%	85%

4. Conclusion

Through the value assessment and optimization strategy model, the value and optimization strategy of physical education in colleges and universities are analyzed and the following

conclusions are drawn:

(1) Comparing the performance of students in physical education integrated with curriculum ideology and traditional physical education, the average GPA of students in physical education courses integrated with ideology is about 4.7% higher than that of the traditional physical education course group, and the integration of curriculum ideology into physical education in colleges and universities has positively affected the overall development of students.

(2) The comprehensive quality score of students in the physical education group integrated with Civic Policy was significantly higher than that of the traditional physical education group, by 2.6%, which promoted the improvement of students' physical and mental health, ideological and moral quality, and comprehensive quality.

(3) Observing the students' participation in physical education integrated with curriculum ideology and politics, it was found that the participation of students in the physical education group integrated with ideology and politics increased by about 12.4% compared with the traditional physical education program. It has far-reaching value for cultivating professionals with social criticality and promoting education for sustainable development.

References

[1] Ward, P., & van der Mars, H. (2020). Confronting the challenge of continuous professional development for physical education teacher educators. Journal of Physical Education, Recreation & Dance, 91(1), 7-13.

[2] Chiva-Bartoll, O., & Fernández-Rio, J. (2022). Advocating for Service-Learning as a pedagogical model in Physical Education: towards an activist and transformative approach. Physical Education and Sport Pedagogy, 27(5), 545-558.

[3] Herold, F. (2020). 'There is new wording, but there is no real change in what we deliver': Implementing the new National Curriculum for Physical Education in England. European Physical Education Review, 26(4), 920-937.

[4] Case, L., Schram, B., Jung, J., Leung, W., & Yun, J. (2021). A meta-analysis of the effect of adapted physical activity service-learning programs on college student attitudes toward people with disabilities. Disability and rehabilitation, 43(21), 2990-3002.

[5] Mcguffog, R., Rubin, M., Boyes, M., Caltabiano, M. L., Collison, J., & Lovell, G. P., et al. (2023). Sleep as a mediator of the relationship between social class and health in higher education students. British Journal of Psychology, 114(3), 710-730.

[6] Lynch, S., & Sargent, J. (2020). Using the meaningful physical education features as a lens to view student experiences of democratic pedagogy in higher education. Physical Education and Sport Pedagogy, 25(6), 629-642.

[7] Serra, P., Rey-Cao, A., Camacho–Miñano, M. J., & Soler-Prat, S. (2022). The gendered social representation of physical education and sport science higher education in Spain. Physical Education and Sport Pedagogy, 27(4), 382-395.

[8] García-Rico, L., Martínez-Muñoz, L. F., Santos-Pastor, M. L., & Chiva-Bartoll, O. (2021). Service-learning in physical education teacher education: A pedagogical model towards sustainable development goals. International Journal of Sustainability in Higher Education, 22(4), 747-765.

[9] O'Brien, W., Adamakis, M., O'Brien, N., Onofre, M., Martins, J., Dania, A., ... & Costa, J. (2020). Implications for European Physical Education Teacher Education during the COVID-19 pandemic: a cross-institutional SWOT analysis. European Journal of Teacher Education, 43(4), 503-522.

[10] Shukurov, R. S. (2021). The development of a healthy culture of living for students-youngstres through physical education and sports as a pedagogical problem. Conferencea, 63-65.

[11] Piggin, J. (2020). What is physical activity? A holistic definition for teachers, researchers and policy makers. Frontiers in sports and active living, 2, 72.

[12] Liu, Z., & Li, C. (2020). Research on the Construction of "Four in One" Mode of Ideological and Political Education for College Students under the New Media Environment. Lifelong Education, 9(7), 128-130.

[13] Conefrey, T., & Smyth, D. (2020). Reflecting, Integrating, and Communicating Knowledge through ePortfolios to Increase Civic and Scientific Literacy. International Journal of ePortfolio, 10(1), 1-18.

[14] Dhinakaran, D., & Prathap, P. M. (2023). Preserving data confidentiality in association rule mining using data share allocator algorithm. arXiv preprint arXiv:2304.14605.

[15] Haines, S., & McClure, C. (2020). Preparing Preservice Teachers Using a Civic Engagement Model: The Effect of Field Experience on Preservice Teacher Knowledge, Skills, and Attitude. Science Education and Civic Engagement, 12(2), 91-105.

[16] McNamara, S. W., & Haegele, J. A. (2021). Undergraduate students' experiences with educational podcasts to learn about inclusive and integrated physical education. European Physical Education Review, 27(1), 185-202.