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Research Article

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Philosophy and the Modern Courses Education Using Grey System Theory

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ABSTRACT

Professional skills are important to students who major in Philosophy and the Modern course education. They must be able to conduct the tasks required by the teaching of Philosophy and the Modern courses activities. Evaluation of the student's skills can offer a theoretical basis for measuring a Philosophy and the Modern course but an effective evaluation method is lacking. Therefore, an evaluation method based on the grey system theory is proposed in this article. First, the educational structure of the PM is discussed; second, the mathematical model of grey system theory is presented; and third, the structure of the professional skills evaluation model of students majoring in PM education is presented. The evaluation index system, the results of which are drawn from a questionnaire distributed to 800 students, and the evaluation programme, is put forward. A case study was carried out, the results of which show that the evaluation method outlined here can contribute to improving overall standards in the course.

Keywords: Philosophy and the Modern course； Evaluation； grey system theory

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INTRODUCTION

With the expansion of higher education in China, improving students' education is a key goal. Higher education should focus on developing both the innovative and practical abilities of students, as well as their personal and academic qualities. In recent years, there has been a high demand for students studying Philosophy and the Modern education (PM). Philosophy and the Modern education skills are necessary for all sporting activities and students studying PM should have good practical skills for observation, expression and communication [1].

The PM student's professional goal is to teach and to provide guidance. At present there are disadvantages for the PM students in developing their skills and evaluating their abilities on PM courses. Reform of PM teaching must be continued and deepened, so as to improve students' skills.

The grey system theory, initiated in 1982, is the mathematical theory that solves problems where there is incomplete information [2]. The grey system theory can be used to crystallize and quantify the evaluation of students' abilities on PM courses. Conclusions can be drawn from the data even though all of the underlying rules are not understood.

Grey relational analysis is a new method in the grey system theory. In grey relational analysis a system with no information is black and a system with perfect information is *white*; these extremes are unlikely in real situations.

Grey relational analysis is used to analyze the relationships between the various factors of a system.

The relational degree is a measure of the relationship between all factors and can be used to evaluate PM students' abilities. There are many uncertainties in evaluating the abilities of PM students, and this implies that students' abilities can be regarded as grey, and suitable for analysis using the grey system theory.

THE EDUCATION PROCESS

The abilities of students studying PM are poor and do not meet the requirements of colleges or society. This affects their employment opportunities. The problems with PM teaching are as follows [3]:

First, the structure of the curriculum is inappropriate and the basics are not properly emphasized. The time allocated to different components of the course is incorrect, and the theoretical and technical subjects are not properly arranged. The course content is bland and the scope is narrow.

Second, the teaching of the practical sessions is weak. The teaching of practical is dominated by practice as it should be but should not be limited to it; for example, the graduate may be expected to engage in physical activities in society and in group fitness instruction. The range of the practical teaching is narrow and the time spent on it short. The time allocated to practical is not adequate and the feedback is insufficient.

Third, extracurricular activities are not properly integrated into the course, with inadequate support for sports clubs and sports associations, etc. Therefore, the PE students are not being exposed to enough extracurricular opportunities.

Training is similar to systems engineering, in that it centres on the design and management of a complex project over a life cycle and an evaluation of the results, i.e. improving students' skills. The teaching of the PM could be evaluated to determine the main problems. Metrics could then be used to optimize the course structure to obtain the best outcomes for students.

PROCESS IN DEVELOPING PERSON'S INTELLIGENCE

the education process into three stages: the romantic stage, the precision stage and the application stage. The romantic stage is when students begin to comprehend, but knowledge is not systematic; the precision stage is the period where students gain more knowledge to increase and supplement their earlier learning, and where they acquire facts in an organized way and expand the general learning of the romantic stage. The application stage is the ultimate goal: to comprehensively apply knowledge after learning the concepts and the pertinent skills .

The growth of knowledge is the result of the ordered, harmonious and iterative development through the three stages[3]. A learner, in the process of study, should be assigned tasks matching the stage he/she is in, or his/her development will be affected. If viewed by age, the three stages correspond to infants and young children, teenagers and university students, with each stage requiring the right courses and in small steps.

The right content should be taught based on the stage, the level of knowledge and the intellectual capacity of each student. No student can tackle the three stages concurrently. Whitehead emphasized that teaching content requiring diverse comprehension should be put into different, subordinate cycles. Through this a harmonious pattern takes shape in the student's mind. Meanwhile, teaching quality should improve as education adapts to the stage that a student has reached. He believed that ignoring the pacing and factors that influence education was the main cause of poor and inefficient education.

THE EDUCATION PROCESS

The challenge here is to recognize intelligence and to motivate the drive to achieve, which cannot be awakened just by words. Any teacher with experience knows that education is a demanding process requiring much patience in delivering detail in an iterative manner day after day. Therefore, when teachers analyze the central mission of education, they would find that achieving the mission depends on making an optimum adjustment to a number of variables.

The reason is that educators are dealing with live human brains. For students, the thirst for knowledge, their judgements and their mastery of complexity, must be developed to enable them to apply theoretical knowledge to particular situations. These abilities cannot be delivered through one fixed approach, e.g. as implied by the current examination system. So, teachers must implement the educational process in the right way for individual students and at the right time.

GREY ANALYSIS SYSTEM

The grey system analysis includes grey relational analysis, grey cluster analysis and grey decision analysis. The grey relational analysis can be applied to situations where the data are limited and grey. The basic idea is as follows: similarity of series curves is used to judge whether a relationship is close, and the grey relational degree is used to measure the closeness. Grey relational analysis requires limited calculations and yields reliable results; it has been used, for example, in engineering.

Grey cluster analysis gathers observations into several definable classifications according to the white weight function. Grey cluster analysis has two methods as follows: The first method is grey relational cluster analysis, which is applied when merging comparable factors to simplify a complex system.

For a grey system, the time series reflects the behaviour of the system. The evolution at time i is expressed as follows:

$$X^{(1)}(k) = \sum_{i=1}^{k} X^{(0)}(i) = X^{(1)}(k-1) + X^{(0)}(k)$$

$$X^{(1)} = \left\{ X^{(1)}(k), k = 1,2,\ldots,n \right\}$$

An index can denote several close relationships or a factor can include several other factors to describe the information without serious loss. The second method is the grey white weight function cluster, which is applied to judge whether the object belongs to a different classification.

CASE STUDY

The data from 800 college students majoring in PE in 30 colleges were used to carry out an empirical analysis, using the grey system theory. The weights of second degree indices were calculated according to Formula (1), and the results are shown in Table 1.

Table 1: Relational degree of first degree indices.

First degree index	Relational degree
I1	0.557
I2	0.643
I3	0.518
I4	0.421

I5	0.446
I6	0.384

CONCLUSION

A qualitative and quantitative analysis, based on the grey system theory, was carried out to evaluate the skills of students majoring in physical education. The evaluation index system was verified, using questionnaire data and the first- and second-degree indices were obtained. The ranking of the indices was evaluated and a teaching reform measurement determined. This provides a mechanism by which to improve the abilities of students majoring in physical education.

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