

Methodological Principles of Identifying Indicators of Key Competences of Physical Education Discipline*

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Abstract—Given the fact that the development of key competences of physical education discipline plays an important role in nurturing students' key competences, the current study is designed to give a close observation on characteristics of physical education, exploring into the method of identifying every dimension of key competences and their level of development in physical education and meanwhile making corresponding reasonable explanation. The methodological analysis of identifying indicators of key competences of physical education discipline cover several aspects, including theoretical preconditions, a theoretical framework and the way applied to identify the indicators. It is found in the study that the identification of key competences should abide by a principle of being concise, influential and concordant as well as a combination between quality and quantity. Besides, the operability, measurability, weights among indicators and development levels of different indicators should all be taken into consideration. It is hoped that the study can be helpful for improving the assessment technology and the standard system in identifying indicators, which will enable it possible to better describe, explain, monitor, predict and finally improve students' key competences of physical education.

Keywords—*key competences of physical education discipline; indicators; methodological principles*

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I. INTRODUCTION

Key competences has become an important topic in the fields of global education policy, education practice and education research and it motivates changes in education paradigms and styles of learning all over the world. In September, 2016, China promulgated the overall frame of "Key competences for the Development of Students in China" which marks the transition in the field of key competences education from theories to practice and becomes significantly influential for the new reform of education in China.

The primary and secondary school education in China is characterized by developing students' key competences through teaching activities in different disciplines. Thus, it can be said that the development of key competences of certain specific disciplines becomes the important channel for the development of students' key competences. At present, many studies related to key competences of the discipline of physical education have been carried out. The study which is engaged in identifying indicators of key competences of physical education will not only influence the progress of the curricular and teaching reform but also propel the reform in the assessment system.

II. ESSENTIAL FEATURES OF KEY COMPETENCES OF PHYSICAL EDUCATION DISCIPLINE

The global research history of key competences has been as long as twenty years but the research about this idea at the policy level is relatively new in China. It is pointed out by the research group in China for the general framework of developing students' key competences that key competences are the essential qualities and key abilities of students which are indispensable for students' lifelong development as well as the development of the society. The development of key

competences focuses on nurturing all-round talents and depends on three dimensions which include the foundation of culture, independent development and social participation. Specifically, it is represented by six qualities which refer to the humanistic knowledge background, the scientific spirit, the acquisition of learning methods, healthy lifestyles, the assumption of obligations and innovation and the six qualities can be further classified into eighteen basic factors [1].

The concept of key competences is a reflection of humanistic idea and a return in education to the cultivation of students' abilities. From the perspective of value orientation, key competences embody personal value and social value. It focuses on students' development and social adaptability and also indicates the common values between the nation and the society. As for the choice of indicators, basic qualities which are essential for the personal adaptability in the future social life and lifelong development will be identified. Those indicators should have the feature of being universal and fundamental, which is indispensable for students to deal with the constantly changing world and to handle problems in different areas of study and fields of life. As for the content of key competences, they are synthetically made up of knowledge, skills, emotion, attitude and value and an organic combination between "hard skills" and "soft power". Key competences are represented by a type of overall competence structure and there are mutual influences among different indicators.

Based on the knowledge of key competences and the characteristics of the discipline of physical education, key competences of physical education are defined as qualities developed during the process of physical activities and they are the most essential for students to develop a healthy way of life. To some extent, it can be said that key competences of physical education are the indispensable qualities in the subject of physical education since they can represent part of or even whole competences that students can develop after receiving physical education and meanwhile they also embody some unique features of the subject of physical education.

Some Chinese scholars, such as Sumei Yu, Xiu Yu and Qi Chen have conducted research from different perspectives to inquire into the concept, components and framework of key competences of physical education discipline. Studies of the components of key competences of physical education discipline choose indicators both from those that can represent the unique value of the subject of physical education, such as students' basic skills in this subject and from those that can show the educational value in the subject of physical education. Students' all-round development will be promoted and the change in their knowledge, skills, emotion, the attitude and value will represent the fundamental development in key competences.

Previous research can lay a foundation for the study of key competences of physical education discipline but indicators of key competences are not specified enough and there are almost no studies which focus on the development of key competences of students in different time periods.

Thus, the operability of indicators has been greatly influenced. There is still a long way to go for researchers before they can identify indicators which can better represent the core issues in physical education and which can make it feasible to instruct, standardize, inspect, evaluate and improve students' key competences of physical education.

III. RESEARCH METHODOLOGY OF IDENTIFYING KEY COMPETENCES OF PHYSICAL EDUCATION DISCIPLINE

The research which is engaged in identifying indicators of key competences of physical education discipline will on one hand identify every dimension of key competences of physical education discipline and on the other hand clarify the level of development of each indicator and meanwhile give reasonable interpretation of the development level of physical literacy from different dimensions. The primary purpose of the research is to expound the method of studying indicators of key competences of physical education discipline. Generally speaking three aspects will be under the focus. Respectively they are the theoretical precondition for the identification of indicators, the analytical framework and the way to be applied to identify the indicators.

A. *The Theoretical Precondition for the Identification of Indicators*

The theoretical precondition for the identification of key competences of physical education discipline is the ontological assumption of the interaction among physical education, individuals' physical and mental health and the environment. Whitehead pointed out [2] that human beings in nature constitute an integral existence which cannot be separated and individuals' body and mind are coordinated and unified, being equally important. She didn't agree with the dualistic viewpoint that human beings are made up of two separable components of body and mind and believed that this viewpoint undervalued human beings' physical activities and only took body as an entity that was secondary to mind. In accordance with the fact the human beings constitute an integral existence and the view that human bodies represent the significance of existence, the identification of key competences of physical education discipline should take the all-round development of human beings as the core and meanwhile develop the special physical, mental and spiritual features of human beings. It is hoped that a positive interaction among human beings, the natural environment and the social environment can be realized through the promotion of human beings' active participation in the whole life process.

Scholars tend to take phenomenology and existentialism as the philosophical foundation for the concept of physical literacy. Based on the phenomenological foundation, individuals are believed to establish special perspectives under the influence of previous experience in life and they tend to apply the special perspectives to look upon the world. It is pointed out by existentialism that the occurrence of the special perspectives of individuals can be attributed to the interaction between human beings and the surrounding environment. Thus, the reason why special features are present is that human beings have meaningful experience of

being engaged in physical activities. Special features involve individual representation and implication which can be further represented by individual cognition, imagination, deduction, sense of pleasure and emotion influencing individual self-confidence and sense of self-value. Those essential factors are indispensable for the interaction between individuals and the environment.

Based on the considerations mentioned above, the research proposes that the identification of key competences of physical education discipline should start from an integral perspective, taking the relationship among physical education, individuals and the environment into consideration. Besides, the mutual influence among different factors should not be ignored either, by which doing it is hoped that factors which are influential on the development of the relationship can be identified.

B. Theoretical and Analytical Framework for the Identification of Indicators of Key Competences of Physical Education Discipline

The identification of indicators of key competences of physical education discipline should be based on certain theoretical foundation and meanwhile an analytic framework. Organization for Economic Cooperation and Development (OECD) started the project of the "Selection and Definition of Key competences" with a primary focus on analyzing functions and requirements. OECD identifies the function of key competences as a successful life and a developed society, based on which the analysis on the life requirements of individuals and the expectation of the society is carried out. After the analysis of the function and requirements, the theoretical elements for the study of key competences will be determined. Viewpoints from experts in different subjects and from different institutions are collected and classified and finally a framework which is made up of interrelated factors is established, including three dimensions and nine indicators for key competences [3]. The establishment of ACSF is based on a method of theoretical analysis of multidimensional orientation. It analyzes and draws reference from curricula and qualifications which have been accredited, such as the national curricular standard, curricular plans, frameworks of national qualifications, the learning outline of European Council, school syllabuses, references for assessment and so forth. The theoretical foundation and the method applied include the perspective of social constructivism and theories of learning which gives analyses of the factors influencing learning effects of students, the relationship among different factors, the learning process and the roles individual students play during the learning process. Five key competences together with five levels of development ranging from the first level to the fifth level have been finally identified. Different levels for each quality are explained by indicators, characteristics in performance and activities in cases so as to give a consistent assessment of individual performance. Levels of performance are identified based on "key steps", "characteristics of performance" and variables of performance which respectively include the form, nature and degree of support to be obtained, the familiarity with the

background, the complexity of the situation and the sophistication of the task [4].

The two international theoretical frameworks are of great significance for expanding the research horizon of the development of key competences of physical education discipline in China. The identification of indicators for key competences of physical education discipline in the country should be all-inclusive, drawing on a variety of viewpoints, including the idea from the other countries and meanwhile carrying out a scientific design which is based on theories and the requirement and the goal of the development of physical education in the country.

C. The Method to Be Applied to Identify Indicators

At present, studies in relevant areas in China mainly expound key competences of physical education discipline based on the background of educational situations and the development of physical education both in China and in other countries, such as the educational planning by government institutions and the development planning for physical education. International achievements in the relevant fields have been used for reference. There are other studies which are conducted from a micro level. Based on personal experience in education, some scholars tend to make a dialectic analysis but quite often large-scaled empirical investigations and reflections on the development of students' physical literacy are absent and specific situations and problems during the research processes are neglected. There are two ways for the identification of indicators for key competences of physical education discipline in China. Specifically, there should be a combination between the deductive method and the inductive method. It is inductive because there is a need for extensive investigations based on the realities in the country. The development of students' physical literacy has to be thoroughly probed into. Thus, researchers have to ask for different opinions from experts, scholars, teachers, parents and students. At last, based on the economic and social development of the country and influences from the national culture and traditions, indicators for key competences of physical education of students will be identified. The identification method will also be deductive in nature since researchers can draw reference from internationally advanced indicators for key competences of physical education discipline and from relevant research findings. Given the fact that there is a great variety of situations, researchers can make corresponding adjustment and improvement to make sure that indicators for the situation in China are consistent with those in the internal system. Based on the discussion abovementioned, it is proposed that indicators for key competences of physical education discipline can be identified by the way of making questionnaires and organizing experts to investigate to what extent have those indicators been agreed upon.

IV. PRINCIPLES FOR THE IDENTIFICATION OF KEY COMPETENCES OF PHYSICAL EDUCATION DISCIPLINE

Functions of the indicators for key competences of physical education discipline include describing, explaining,

instructing, assessing, monitoring and predicting the development of students' physical literacy. To some extent, the identification of indicators reflects the designers' idea on physical education, their understanding of physical literacy and their knowledge of indicators. Thus, the chosen indicators embody the designers' outlook of education and assessment. Many factors will influence the identification of indicators for key competences of physical education discipline, such as the method of identification, the weights among different indicators, the level of development of individuals in different life periods and so forth, all of which should be decided based on certain principles.

A. The Principle of Being Concise

The study of key competences of physical education discipline should not focus on the quantity of the key competences but on the authentically key competences, which will require that the identification of key competences should abide by the principle of being concise. There shouldn't be too many dimensions for the classification of indicators and the number of dimensions to be chosen should be appropriate. Besides, the logical relations among different indicators should be distinct. Thus, unnecessary repetition should be avoided but key qualities should be covered. For example, the study conducted by L. C. Edwards puts forward three dimensions which are determined based on links among different qualities of physical literacy. The first dimension is called behavior characteristics (including two core areas), the second one psychology, society and attitude (including three core areas) and the third one specific "situations" (including three core areas) [5]. Based on the goal of lifelong participation in physical activities, Whitehead gave detailed descriptions of three dimensions for qualities in physical literacy, including the emotional dimension of motivation, confidence, value and responsibility, the body dimension of the interaction and the transition in different situations and the cognitive dimension of knowledge, understanding and application. Without the principle of being concise, there will be no so-called core indicators of physical literacy. Being concise doesn't mean being incomprehensible but it asks for necessary summary which will help to clarify the indicators commonly shared among different types of physical activities. The development of key competences of physical education discipline should be compatible with the development of individuals' qualities. It should be targeted at developing individuals' adaptability in social life and meanwhile can be transformed into individuals' participation, action and promise, which will further guarantee a sustainable, healthy and comprehensive development of human beings.

B. The Principle of Being Influential

The purpose of the identification of indicators of key competences of physical education discipline will not be restricted to instruction or assessment but will be a positive role played in the development of the curriculum of physical education, textbooks teachers and students, which presents the principle of being influential. In 2013, SHAPE took the five standards which are essential for individual development of physical literacy as the general objective in the new

version of "American National Curricular Standards of Physical Education" (3rd Version). Accordingly, the development of physical literacy becomes the guiding principle in the reform and practice of physical education in America. In 2014, Canada revised the CAPL (The Canadian Assessment of Physical Literacy) which was developed in 2006. The development of physical literacy of children aged 8 to 12 was continuously monitored and what's more, the assessment was carried out as a "passport in life". The essence of the assessment is to keep track of children's development and growth by a process-oriented assessment agreement. There are four levels for the assessment of physical literacy, including the primitive level, the developmental level, the finished level and the advanced level. The purpose is to draw schools' attention on fostering students' physical literacy [6]. Key competences can be taken as an expectation and assessment of the development in physical education, and the assessment is positive rather than negative. To follow the principle of being influential is to require that indicators of key competences of physical education discipline actively influence the reform in the curriculum of physical education and also in the reform of teaching, the professional development of teachers and the development and assessment of students' key competences. The identification and assessment of indicators of key competences of physical education discipline offer a platform for the development of physical education.

C. The Principle of Being Concordant

The development of key competences of physical education discipline is not isolated and different essential factors require concordant development since they will be mutually supportive. A study conducted by Whitehead [7] explained the mutual relationship among different key indicators of key competences of physical education discipline. The three key indicators of motivation, confidence and physical competence, and the effective interaction with the environment are mutually supportive and they constitute the core elements of physical literacy. Among the three core indicators, motivation will be helpful for students to actively take part in physical activities, which further promotes students' confidence and physical competence. Then confidence and physical competence will strengthen students' motivation in participation and promote individual students to have effective interaction with a more extensive environment. Finally, the relation between individual students and the environment will help to promote confidence and physical competence. When students can successfully establish an effective relation with different types of environment, their motivation in physical activities will be intensified, which will encourage students to have more extensive interaction with the environment.

Besides, when the three core indicators of physical literacy are constantly improved, they will also influence the development of another three indicators, including sense of self and self-confidence, self-expression and communication with others, knowledge and understanding. Specifically, when individuals get successful and beneficial experience in physical activities, they will build positive sense of self and

stronger self-confidence, which will further promote self-expression and intensify their empathy while communicating with others. Moreover, knowledge and understanding will be enriched during the process of participation. What should not be ignored is that the latter three indicators will also have positive influence on the former three indicators. For example, a positive sense of self will help to promote individual motivation, enabling individuals to be willing to accept challenges. At the same time, the smooth communication with others will uplift individual confidence and help to develop individual cooperative abilities. Finally, knowledge and understanding can help to promote the development of physical literacy and deepen individuals' cognition and understanding of different environment.

D. The Principle of a Combination Between Quality and Quantity

Indicators of key competences of physical education discipline can be classified into two types including the qualitative type and the quantitative type. Currently in China, the assessment of educational qualities in physical education is generally realized by focusing on the quantitative indicators, such as the test on students' physique and health. Students' sport performance can constitute an influential indicator which has significance in describing, testing, assessing and explaining the quality of physical education and is closely related to key competences of physical education discipline. Students' sport performance can be used to judge not only their acquisition of fundamental athletic skills but also their attitude, psychology and so forth. The improvement in students' scores of athletic skills is inseparable from key competences of physical education discipline. However, scores are different from qualities since the former can be rapidly improved within a short period of training, thus leaving it possible for students to aim at sheer scores whereas the latter asks for an active participation in physical practice and an active environment, which means that some key competences have to be fostered during a long process.

As a result, it is essential to investigate that under what situations will the sport performance be taken as an indicator and in what situations will the other indicators have to be considered. Sport performance is just a part of key competences of physical education discipline and it is relevant to many aspects of a student' development, such as the willingness to do sports or to take exercises continuously, the basic knowledge of sports, the acquisition of skills and strategies, the external motive force, interest in sports, habits and volition and so forth. In the actual practice of physical education, it is not enough for teachers to merely focus on students' sport performance since it is also very important to foster students' interest in sports, promoting their active participation in physical activities, strengthening their will and fostering their sportsmanship. The strong motivation and perseverance together with the development of athletic skills will enable students to acquire fine physical literacy and finally will promote overall physical qualities of students.

V. CONCLUSION

There are many aspects that cannot be scientifically quantified in the identification and assessment of key competences of physical education discipline, such as students' willingness for doing sports, attitude, volition and habits. Researchers in Canada work out CAPL to make assessment on key competences of physical education discipline and it is a combined method of on-the-spot tests, questionnaires and tracking tests. The test is made up of four components which include test dimensions, weights, test indicators and scores for each test indicator. Among the four components, test dimensions are further classified into four sub-dimensions which cover daily behavior, physical ability, motivation and confidence, knowledge and understanding. Whether key competences of physical education discipline in China can be effectively assessed depends on the identification of indicators of key competences and the quantitative and qualitative design of those indicators. At present, it is still a challenging job to test non-cognitive qualities since there is a great concern about the objectivity and the scientific nature of the test. It can be assumed that records, certifications and reports will become the focus in future studies in China and there is a great need for the country to establish a paradigm for the study of key competences of physical education discipline, ranging from the abstract concept to the tool measurement and finally to the empirical data. The technological method and the standard system applied for the assessment of indicators of key competences of physical education discipline will show to what degree has the objectives been achieved and they can also be applied to monitor, improve and predict every aspect in the system of physical education, proving support for policy making.

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