

EVALUATING THE SUITABILITY OF THE COMPONENTS AND INDICATORS OF STRATEGIES FOR TEACHER DEVELOPMENT OF PHYSICAL EDUCATION TEACHERS AT LOCAL UNIVERSITIES IN GUANGXI PROVINCE, CHINA

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Abstract: The teacher development of physical education teachers at local universities is one of the most important aspects to stress in the journey towards high-quality development of higher education. This paper attempts to evaluate and create suitable components and indicators of teacher development strategies for Physical Education Teachers. It will be conducted through literature review (document analysis) and expert evaluation to formulate the teacher development index system of local university physical education teachers in Guangxi. This is in order to provide better guidance for the teacher development of local university physical education teachers in Guangxi Province in the 21st century. The results show that the experts agreed teacher development made up of 4 components: willingness for teacher development, literacy of teacher development, teacher development approach and teacher development policy. These are further broken down as follows: willingness for teacher development has 2 indicators; teacher emotion and teacher development motivation; literacy of teacher development has 4 indicators: general literacy, teacher literacy, practical literacy and educational concept literacy; teacher development approach has 3 indicators: training mode, training fund and training effect; teacher development policy has 3 indicators: higher education policy, teacher title promotion system and performance appraisal system.

Key words: Teacher Development; Local University; Physical Education Teachers; Guangxi Province; Component; Indicator; literature review (document analysis); expert evaluation.

1. Introduction

Statistics obtained from the Chinese Ministry of Education in 2022, stated there are 1,270 general undergraduate universities in China (Ministry of Education, China, 2022). 114 are affiliated with the central Government and 1,156 are local universities. This number accounted for more than 91% of the total population (Wei Lingling, 2022). The implication is that local

universities are the main providers of higher education in China. They form an important part of the education system in the province. As far as Guangxi Province is concerned, there are currently 26 general undergraduate universities, of which one is a central university (run by the Central government), and 25 are local universities (run by local government). The local universities account for more than 96% of the total enrolment. This shows that the local universities in Guangxi Province are also the main provider of higher education in Guangxi Province.

Teacher development is gaining new skills through continuing education and career training after entering the workforce. It can include taking classes or workshops, attending teacher or industry conferences, or earning a certificate to expand the related knowledge of the person concerned. In the case of Guangxi province, since the universities are placed under the jurisdiction of different entities (central and local government), teacher development is being carried out differently. This is because training and the allocation in terms of finance, to name two, are different. Thus, this results in different level of quality when teachers at central universities are compared to teachers at local universities. The number of students enrolled in universities run by local government are way higher compared to those enrolled in the only university run by the central government. The same also applies to the teachers/lecturers in the two groups of universities. It goes to show that, generally, if the province aims to produce good students who will be good workers when they graduate, teacher training or development of the same standard should be provided to both groups of teachers or lecturers.

Physical education teachers in Guangxi local universities form an important segment of the teaching fraternity in Guangxi Province. They are engaged both in daily teaching and scientific research as well as being involved in various levels of sports training and competition. Among the tasks where they are involved in are the organization of events, serving as team leaders in training and eventually entering competition. Therefore, the teacher development of physical education teachers at local universities in Guangxi Province is not only related to the improvement of their personal teacher quality and teacher ability, but also has a direct impact on the improvement and optimization of all aspects related to physical education. These include the quality of physical education classroom teaching, the level of research related to physical education, the physical health of college students, and the performance of sports teams in competitions.

In spite of the sharp disparity between the two groups of teachers and lecturers and the urgent need for teacher development of the physical education teachers at local universities, research on this field is still lagging behind. Based on this, the researcher chose the teacher development of physical education teachers at local universities in Guangxi Province as the research objective, and formulate or set up the indicator system of the teacher development of physical education teachers at local universities in Guangxi Province through literature review and expert evaluation.

2.Objectives of the Study

This study dealt with two research objectives:

Research Objective 1: To study the components and indicators of teacher development of local university physical education teachers

Research Objective 2: To confirm the components and indicators for teacher development of local physical education teacher

These leads to the two research questions below:

Research Question 1: What are the components and indicators of teacher development of local university physical education teachers?

Research Objective 2: What are the components and indicators for teacher development of local physical education teacher as confirmed by experts?

3.Core Principles for Teacher Development of Teachers and Lecturers

3.1 Principle 1: Build on a foundation of skills, knowledge and expertise

Teacher development needs to be built upon the current foundation of basic skills, knowledge and areas of expertise of the educational personnel involved. Teacher development will link new knowledge and activities with what the practicing teachers already know and are able to do, which will extend their thinking. Those who intend to attend teacher development events will bring different experiences, knowledge and skills. The trainers must determine the current level of expertise, needs of the participants and develop suitable resources and activities. These activities must be based on the same foundation.

Principle 2: Engage participants as learners

Teacher development activities should include rich and varied opportunities that engage educational personal as learners and offer the opportunity to apply new skills and knowledge. Teacher development is effective when the materials are presented in a hands-on manner using suitable techniques according to the different learning styles. While practicing, teachers should be ensured of their safety.

Principle 3: Provide practice, feedback and follow-up

Teachers and lecturers should be allowed to practice the new skills, strategies and techniques picked up during training, provide feedback on the performance and continue with follow-up activities. A constructivist approach to this precludes didactic presentation of decontextualised knowledge and skills. This principle reinforces the rule that information about skills and knowledge must be presented to educational personnel in a manner that allows them to connect new information learnt to their current knowledge and skills, and allows them to construct their own meanings. Interactive, hands-on approaches to teacher development make use of andragogy.

Principle 4: Measure changes in teacher knowledge and skills

Successful and effective teacher development should be manifested by measurable increases in participant knowledge and skills. The evaluation of a participant's knowledge and skills is essential to the effectiveness of the teacher development program. The evaluation of the teachers should be based on what the teachers do and its effect on the students.

Principle 5: Measure changes in student performance

Teacher development should be linked to measurable outcomes in student performance, behaviour, and achievement. This is important so that the types of effective activities with specific contexts is known. The local level division involved in the activities must identify what measurable student outcomes it wants to change before planning the activities.

3.2 Stages of teacher development

It is through these stages that we learn, grow, adapt and ultimately lead. The three stages of teacher development are applicability, adaptability and acceptability. This is used as a roadmap for teacher progress, allowing us to recognise where we are, where we need to go and how to get there. These stages should be accompanied by features of a good teacher development plan. This plan consist of four main items, namely goals, resources, strategies and self-assessment. Effective teacher development is active when it engages teachers physically, cognitively and emotionally through activities such as problem solving (Knowles, 1983), sharing (Lieberman & Pointer Mace, 2008) and discussion (Quick et al, 2009).

4 Terms used in this study

4.1 Local university

Higher education in China is made up of central affiliated universities, local affiliated universities and private universities. Among them, local universities also known as provincial universities are under the jurisdiction of provinces, municipalities and autonomous regions in the province. These universities mainly rely on local government funding (some local universities are jointly invested by the local government and the central government), and come under the management of local government.

In China, local universities are under the administration of provincial government departments. This implies the training of talents needed is better managed. The financial support given by different local governments is often different. This difference resulted in a large differences in the funding available to local universities in different provinces or in different regions of the same province: While the universities in some economically developed provinces have sufficient funds, the universities in some economically underdeveloped provinces are constrained by insufficient funds. Thus, some local universities may not have as many resources

and platforms as central universities, and are at a relative disadvantage in talent development, enrolment, social cooperation and many other aspects.

Due to its positioning and situation the local university can form good linkage with the local communities resulting in better talent training to fulfil the needs local enterprises and institutions (including the needs of science and technology and the needs of employment), and improve the social influence and social reputation of the university (Tan Kunhua, 2008).

In summary, local university refers to universities that rely on local government funding and are subject to local government management.

4.2 Physical education teachers

There are two main types of physical education teachers or lecturers in Guangxi province. The first are the full-time physical education teachers in local ordinary universities. They may be attached to the public sports teaching and research section of the school or to the department of physical education or college. They are responsible for teaching the non-physical education students, public physical education or sports major. Thus they either teach or train the school sports team. As such, full-time physical education teachers in ordinary universities need to equip themselves with the pedagogy aspect.

The second type is the physical education teachers in local physical education universities. Although these teachers will also undertake some non-physical education public physical education teaching tasks, overall, the main content of their work is still focused on the training and competition of students majoring in physical education (including many teacher athletes), which makes their job responsibilities more important for training than teaching. The requirements for sports skills are high and the requirements for education and teaching skills are low. These teachers are mainly the coaches.

It can be seen from here that the job scope for the two groups of teachers or lecturers are different

According to the Curriculum Standards of Physical Education and Health for Compulsory Education, the main goals of physical education teaching include the mastering of the basic knowledge, basic skills and methods of physical education and health, enhancing physical fitness. There is a need to learn and exercise, develop the practical and innovative ability of physical education and health, experience the fun and success of sports, and forming the habit of physical exercise, developing good psychological quality, cooperation and communication ability, improving the consciousness of consciously maintaining health, as well as maintaining a healthy lifestyle and a positive, optimistic and cheerful attitude toward life (Ministry of Education, China, 2011). In short, the local university physical education teachers also need to undertake the heavy responsibility of cultivating students' sports awareness and sports habits, and teach students the way of lifelong sports.

To sum up, local university physical education teachers are a kind of teacher personnel engaged in physical education teaching activities in local universities.

4.3 Teacher development

Teacher development is gaining new skills through continuing education and career training after entering the workforce. It can include taking classes or workshops, attending teacher or industry conferences, or earning a certificate to expand their knowledge in their chosen field. To date, the teaching profession has developed into a specialized profession that requires certain teacher knowledge and teacher skills. The specialization of the teaching profession is mainly reflected in two aspects that complement each other. Firstly, to be engaged in the teaching profession, one must master a certain set of knowledge and skills of the subject taught, keep up with the frontier of the development of the subject, and become an expert in a certain subject field. Secondly, to be engaged in the teaching profession, teachers must be familiar with the knowledge and skills of education and teaching, and be able to apply it in their daily work so as to become an expert in the field of education. The above two points are the fulcrum of teachers' teacher specialization and form the center of gravity of teachers' teacher development. In the 21st century society, the rapid development of science and technology has not only caused the speed of knowledge renewal and dissemination to increase, but also greatly changed the what and how of education. Therefore, if teachers want to be more competent in their profession, they must understand and master the new subject knowledge, and constantly enrich their pedagogical knowledge and skills.

From the perspective of theoretical research, as early as 1966, UNESCO stated in the Recommendations on the Status of Teachers that teaching is a profession. This has spearheaded numerous researches into topics like Teacher teacherization and teacher development. This has strengthened the teacher status of teachers.

Although the theory and practice of teacher development are becoming more and more mature, it is undeniable that there are still some uncharted courses in the theory of teacher development. One of them is that the connotation of teacher development is not very clear. This has created multiple meanings to the term. This has caused confusion among academics during academic exchanges. Just as some scholars pointed out, "when some scholars use foreign materials for reference, they lack the concrete and overall understanding and transformation combined with the educational situation, and some scholars only stay in the experience state described by intuition, which often results in the difference of the referential objects." (Liu, 2003) The question thus arise as to what exactly is teacher development? Researchers try to analyze the concept of teacher development from two aspects: "the main body of teacher development" and "the way of teacher development".

The content of teacher development in existing literature involves the understanding of "development" in "teacher development". This covers two aspects/concepts, namely "the teacher

development of individual teachers" and "the teacher development of a group of teachers". Although both of these regard teaching as a profession, the difference is that the former focuses on the process of teachers gradually growing from a novice to an expert teacher from an individual perspective. For example, "Teacher development refers to the teacher knowledge, teacher skills, teacher affection, teacher autonomy, teacher values and teacher development awareness of individual teachers from low to high. The process of gradually conforming to the standards of teacher teachers." (Song, 2005) From the perspective of the group, the latter focuses on the process in which the profession of teachers is gradually transformed from "non-teacher" and "semi-teacher" to "teacher". Zhu (2007) said "from the perspective of the group, teacher development refers to the degree to which the teacher group of teachers meet the teacher standards, that is, the process of teacher specialization."

From the above analysis of the two concepts, it is not difficult to see that the focus of "teacher development" lies in the individual teacher, which emphasizes the growth process of a teacher as a teacher from infancy to maturity. In this process, the collective power of teachers is only an external factor to promote the self-growth of teachers. In contrast, "teacher development" and "teacher teacherization" are actually different words representing the same meaning. The emphasis is on teaching as a social profession, from not having too high teacher standards and teacher status, to having higher teacher standards and teacher status and constantly improving the process. The growth of individual teachers is the premise and basis for the realization of teacher development.

Domestic and foreign scholars have different ideas and perspectives on the definition of teacher development. Firstly, it focuses on the research development of education and training and aims at promoting the growth and teacher maturity of teachers. Secondly, it focuses on theory, based on the cultivation and improvement of teachers' internal teacher quality structure and teacher specialization norms and consciousness." (Liu, 2003) In other words, teachers' teacher development can be driven by external forces such as policies and training, as well as internal drives such as self-realization and self-development. Both ways of teacher development are necessary, but "internally driven" teacher development is spontaneous, voluntary and conscious, and is a kind of behavior of teachers based on teacher development needs and teacher autonomy. The need of teachers to improve their own teacher quality can provide continuous impetus for teachers' teacher development, which will not be easily changed by changes in policies and training systems. In contrast, the "external force driven" approach to teacher development needs to be based on the establishment of relevant systems or policies.

As a summary, this study defines teacher development to be: Teacher development refers to the dynamic process in which individual teachers constantly enrich and improve their teacher development accomplishment by means of teacher development approach and teacher development policy or system on the basis of the budding desire for teacher development.

Teacher development is similar to continuing education but not exactly the same. Taking classes or reading the latest research can be teacher development. So can volunteering for new

projects in the teachers' current role. It can also include on-the-job training or improving soft skills like becoming a better listener.

Effective teacher development engages teachers in learning opportunities that are supportive, job-embedded, instructionally-focused, collaborative and ongoing. When guided by these characteristics, school leaders can design meaningful learning experiences for all teachers and lecturers.

Teacher development is often defined as 'structured teacher learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes (Darling-Hammond, Hyler & Gardner, 2017). Research has illustrated that teacher competency and skill is directly correlated to student achievement. Policy makers, educators, parents, and students alike, all have a vested interest in identifying the central aspects of effective teacher development to enhance student outcomes. Like so many other forms of training, the key to understanding best practices for effective teacher development resides in between the intersection of research and human determination. A report comparing programs classified seven key, widely-shared elements of effective teacher development. Identifying these seven elements has the potential to streamline and enhance teacher development programs for educators and facilitate much-needed political action from policy makers. These seven elements are:

4.1 Content-focused: 31 out of the 35 studies reviewed contained some sort of discipline focused curricular, for example mathematics, language, science. A content-focused curriculum is significantly enhanced when the subject specific teacher development is delivered in a job-embedded setting, that is the teacher development is carried out in the classrooms.

4.2 Incorporates active learning: adults also learn better when they are actively engaged in the learning experience. In the case of teacher development, teachers thrive when they can interact directly with the new practices they are learning and draw connections to their classroom environment.

4.3 Supports collaboration: Collaboration can span a host of different definitions. Most of the time, it is defined by open dialogue between parties. These parties can be small and focused, for example the relationship between a physical teacher and a coach, or they could be between the educators and policy makers. The more extensive the collaborative party is, the greater the likelihood is that effective teacher development will be properly implemented.

4.4 Uses models of effective practices: there are many ways to model effective practices. Finding the proper model for each school's individual needs is key. Model of effective practices may include videos or written cases of teaching, demonstration lessons, observation of peers, lesson plans and curriculum materials like sample assessments and samples of students' work.

4.5 Provides coaching and expert support: coaching and expert support was employed in many studies. Coaching and mentoring often plays a crucial role in both modelling effective practices and job-embedded collaboration.

4.6 Offers feedback and reflection: access to consistent and reliable feedback on performance as well as time for self-reflection is an essential aspect of effective teacher development.

4.7 Sustainable: research has not confirmed a specific threshold for the duration of effective teacher development programs but the traditional “one and done” workshops are not enough to affect meaningful changes.

Sometimes even well-designed teacher development programs fail to achieve the desired results. This may be due to either failure at school level or higher up at district or provincial level. School level failures may be caused by issues specific to certain schools. These schools mandated curricula that leave little time for teachers to use the new skills they learning during their teacher development. Lack of resources is another common cause of school level failure, especially for teachers who are often forced to pay out of their pocket for their classroom materials or whose schedules may not allow for adequate time for teacher development. Failure at district or provincial level are often intertwined with school level failures. These kinds of failures are indicative of larger problems, like for instance poor data management and outcome tracking, failure to properly identify teacher development needs, mismatched coaching approaches, and lack of county-wide integration. Another of this failure is the inability to choose effective teacher development approaches in the first place due to limited resources.

Policy makers play an important role in ensuring the success of teacher development. Well-designed teacher development programs must be implemented well to be effective. Because of this, policy makers should adopt province-wide standards for the implementation of teacher development. They should also restructure time management with school schedules to maximize time for teacher learning and collaboration. One way to effectively achieve this is to integrate teacher development into the school improvement initiatives. To avoid failures, the universities in the province should all regularly and independently assess teacher development needs and outcomes. To further bolster the positive effects of teacher development, there is also a need to be focused on identifying and developing collaboration, mentoring, coaching and providing technology-facilitated opportunities for teacher development.

There are a variety of approaches to teacher development or teacher education including consultation, coaching, communities of practice, lesson study, case study, capstone project, mentoring, reflective supervision and technical assistance.

5. Research method

5.1 Procedure

Evaluating the suitability of the components and indicators of teacher development of local university physical education teachers depend on important evidence that will be used to design questionnaires for a survey. The researcher started the study by reviewing related literature and synthesize the information to find out the elements and indicators of teacher development. Then, an evaluation form with items related to components and indicators of strategies for teacher development of physical education teachers was sent to be verified by five experts. This is done in two stages. In the first stage, five experts who have been involved in teacher development in various capacities were identified. They were the one and only central government controlled university called Guangxi University followed by four other universities run by the local government. These universities are Guangxi Normal University, Guangxi Minzu University, Guangxi University of Science and Technology and lastly Guangxi Minzu Normal University.

	University	Faculty
1	Guangxi University	School of Civil Engineering and Architecture
2	Guangxi Normal University	College of Literature
3	Guangxi Minzu University	College of Ethnology and Sociology
4	Guangxi University of Science and Technology	School of Mechanical and Automotive Engineering
5	Guangxi Minzu Normal University	School of Literature and Communication

Table 1: university and faculty from where the experts were taken

Table 1 shows the university and faculty from where the first stage experts were taken. These experts were taken from the above university and faculty because these faculties have the most number of students enrolled as well as the highest number of lecturers. These experts have planned and conducted many teacher developments and as such has a lot of experience. These experts were appointed to check the validity of elements and indicators through index of Item-Objective Congruence (IOC). In the second stage five experts were chosen from the faculty of sports in five other universities to evaluate and check the validity of the elements of teacher development of local university physical education teachers. These experts have teacher knowledge and experiences of physical educational management, physical educational research, or physical educational leadership. They also have a minimum of a master's degree, and have more than five years' experience in teaching and advice post-graduate students in the fields mentioned above.

5.2 Research Instrument

The research instrument was constructed in detail as follow: The contents of elements and indicators of teacher development of local university physical education teachers was synthesized based on the literature review and previous teacher development of teacher. The instrument was validated by the five experts stated above.

5.4 Data Collection

The researcher obtained letter from the researcher's faculty of education for permission to conduct the survey. This is to enable the researcher to sent the form to the participating university for permission to consult the experts to validate the evaluation form. Next, the letter and the contents of the elements of teacher development of physical education teacher was sent to five experts by using the hard copy, by email and also face to face discuss to verify and check the content validity, then adjusted in order to construct the questionnaire form. The Researcher obtained all questionnaires within 2 weeks.

5.5 Data Analysis

The questionnaire was assessed by IOC (the index of Item Objective Congruence) which used to find content validity of questionnaire. The IOC was considered as follow:

+1 refers to experts agree with the item

0 refers to the contents of the elements and indicators are unsuitable

-1 refers to experts disagree with the item

6.Data Analysis and Results

6.1 Components and indicators of teacher development of local university physical education teachers.

Shao Linhai (2016) pointed out that teacher development is a dynamic process in which individual teachers, on the basis of the emergence of teacher development needs and teacher autonomy, take teacher education and self-reflection as the main approaches, and take relevant policies, systems and teacher organizations as the guarantee, constantly enrich and improve their teacher knowledge, teacher ability and teacher concepts. It includes 6 components: teacher development intention (including teacher development needs and teacher autonomy awareness), teacher education, self-reflection, policy/system, teacher organization, teacher development accomplishment (including teacher knowledge, teacher ability, teacher concept, etc.). It is important to note that the term "teacher education" here means teacher development approach. The term "policy/system" here means teacher development policy.

Guo Jiajun (2019) pointed out that the teacher development of PE teachers relies on the teacher knowledge and content of PE subjects; Teachers' teacher development is closely related to their own teacher growth needs, which requires teachers' continuous active learning. The teacher development of PE teachers needs a perfect system to support and guide teachers to receive teacher training. It includes four components: teacher development accomplishment (including teacher knowledge and content), teacher development willingness (including teacher growth needs or teacher development motivation), system and teacher training. It should be noted that the term "system" here means teacher development policy, and the term "teacher training" here means teacher development approach.

Lin Lin (2019) pointed out that the teacher development of teachers of public basic courses in higher vocational colleges is the result of the teacher development of teachers of public basic courses in the environment of higher vocational colleges. In order to realize the noble teacher ethics of "love my choice and never regret", have the rich teacher knowledge of "the belly of poetry and book gas from China", improve the skilled teacher ability of "never know this matter to practice" and provide a full range of teacher services of "bow my head as a willing ox", relying on school management, incentive mechanism and evaluation system, Through in-school training, online training, combined training with teacher courses, participation in enterprise practice and social practice and other teacher development approaches, the dynamic process of constantly improving and improving their teacher ethics, teacher knowledge, teacher skills and teacher services. That is, it includes three components: institutional environment, teacher development approach (including in-school training, network training, combined training with teacher courses, participation in enterprise practice and social practice), and teacher development accomplishment (teacher ethics, teacher knowledge, teacher skills and teacher services). It is important to note that the term "institutional environment" here means teacher development policy.

Zhang Xiaolin (2017) pointed out that teacher development is a process in which teachers improve their teacherism, teacher knowledge and teacher ability, update their educational concepts and move from a growth stage to a higher growth stage according to the teacher development plan and through teacher development channels. Teacher development includes four components: teacher development planning, teacher development approach, teacher development quality (including teacherism, teacher knowledge, teacher ability level, educational concept), and various rules and regulations (policies) of teacher development.

Yue Juanjuan (2013) pointed out that teacher development refers to a long-term and continuous process in which individual teachers' teacher ability, teacher accomplishment and personality psychology grow and mature in a special policy environment, so as to achieve the goal of improving classroom teaching and talent training quality. It consists of five components: teacher development intention (independent need for teacher development), goal, teacher development accomplishment (including teacher ability, teacher accomplishment, personality psychology and other qualities), policy environment and teacher development approach. It is important to note that the term "policy environment" here conveys the meaning of teacher development policy.

Day (1999) described teacher development mainly from the aspects of learning experience and activities. In particular, he added the elements of "teacher activities" into teacher development, pointing out that teacher development includes the accumulation of teaching experience and the conscious organization of various activities, which are beneficial to students, teachers and schools. Finally, it can effectively improve the teaching quality. It is important to note that the term "teaching experience" here means teacher development literacy.

Fullan & Hargreaves (1992) pointed out that the structure of teacher development includes not only the development of knowledge and skills, but also the change of self-understanding and ecology. They pointed out that "teacher development" includes the development of specific aspects of teachers and the development of teachers in teaching skills, sense of purpose, and cooperation with colleagues. It is important to note that the term "teaching skills" here implies that it is one of the components of teacher development literacy.

Hargreaves (1994) understood the structure of teacher development from the perspective of teacher socialization. He believes that teacher development includes not only technical aspects such as knowledge development and skill upgrading, but also moral, political and emotional considerations. Here "emotion" can be regarded as one of the components of teacher development intention, and the other components can be regarded as teacher development literacy.

Evans (2002) pointed out that the most fundamental development of teachers is attitudinal and functional development. Among them, the development of attitude mainly includes the development of intelligence and motivation, and the "development of intelligence" here refers to the teacher development accomplishment, and the "development of motivation" here refers to the teacher development intention; Functional development mainly includes procedural and productive development.

Table 1 Component search result

No.	Scholar Components	S h a o (2 0 1 6)	G u o (2 0 1 9)	L i n (2 0 1 9)	Z h a n g (2 0 1 7)	Y u e (2 0 1 3)	D a y (1 9 9 9)	F u l l a n (1 9 9 2)	H a r g r e a v e s (1 9 9 4)	E v a n s (2 0 0 2)	f r e q u e n c y
1	Willingness for teacher development	√	√			√			√	√	5*
2	Self-reflection	√									1
3	Teacher development policy	√	√	√	√	√					5*
4	Teacher organization	√									1
5	Literacy of teacher development	√	√	√	√	√		√	√	√	8*
6	Teacher development approach	√	√	√	√	√					5*
7	Teacher development planning				√						1
8	Goal					√		√			2
9	Learning experience						√				1
10	Activities						√				1

11	Colleague cooperation							√		1
12	Function								√	1

As can be seen from Table 1, based on the components of teacher development proposed by different scholars at home and abroad, the researcher concluded that the components with more than five frequencies are taken as the four components of teacher development. These four components are 1) willingness for teacher development, 2) literacy of teacher development, 3) teacher development approach, and 4) teacher development policy. Supported by literature research, the researcher analyzed each component as follows:

6.1.1 Willingness for teacher development

Shao Linhai (2016) pointed out that teachers' willingness to develop teacherly is an internal cause, and its impact on PE teachers' teacher development is fundamental. If teachers themselves lack the will for teacher development and cannot take teacher development as their internal needs, then, even with good policies and perfect training systems, the teacher development of local physical education teachers in colleges and universities will not be able to show continuity and stability, and their teacher level may not be improved for a long time.

At the same time, it points out that teacher emotion and intrinsic motivation are the organic components of college physical education teachers' teacher development. As far as teacher emotion is concerned, for a long time, "driven by technical rationality, teachers' teacher development focuses on the training of teachers' teacher skills, ignoring the cultivation of teachers' emotions, and teachers generally lack the humanistic feelings and spirit of education, and it is difficult to promote the formation of students' sound personality." (Ma Duoxiu, 2013) In fact, teachers' teacher emotion is very important. Good teacher emotion can not only guide teachers to form correct education outlook, student outlook and career outlook, but also help teachers learn to correctly understand themselves and properly express emotions, so as to promote the smooth development of their education and teaching work. In real life, teachers' teacher emotion can be divided into positive emotion and negative emotion because education is a social activity to cultivate people. Therefore, this determines that in the process of education, teachers should have more positive emotions, which is the same for PE teachers.

The positive emotion of PE teachers is mainly reflected in their attitude towards themselves, students and work. The positive emotion for themselves is mainly to have a correct understanding of their own strengths and weaknesses, to be able to treat their imperfections and the suggestions of others, and then to go forward based on their own advantages with a positive attitude, to overcome their shortcomings, to enhance teacher confidence and teacher self-knowledge. The positive emotion for students is mainly to have a correct understanding of the development of

students, to realize the important position of physical education in the process of formation and development of learning, and to establish an all-round development of students' outlook and education outlook. The positive emotion towards work is mainly that PE teachers should truly identify with the profession of teachers, love the work of PE education, and treat the education and teaching work seriously and responsibly. As far as motivation is concerned, as the core component of teachers' psychological factors, teacher motivation is closely related to teachers' teaching practice, and teachers' teaching practice is closely related to learners' academic achievement.

The motivation of PE teachers' teacher development is divided into internal motivation and external motivation, and the enhancement of external motivation mainly depends on some material and policy incentives. As these incentives depends largely on chance, the external motivation will be affected by the external environment. It may show a large fluctuation. In contrast, the enhancement of intrinsic motivation is related to teachers' personal cognition and personal values. Once these contents are formed, they are not easily changed. Therefore, intrinsic motivation is less affected by external circumstances and is relatively stable. It is for this reason that intrinsic motivation is more controllable and lasting in the motivation of teacher development. Intrinsic motivation will have a significant impact on teacher development. On the one hand, teacher motivation is in the core position among personal factors, controlling or influencing other factors. On the other hand, teacher motivation determines the direction of individual behavior in teacher development and the degree of effort to achieve goals, thus becoming an important predictor of the effectiveness of teacher development." (Han Jiying et al., 2014) With the incentive effect of intrinsic motivation, the teacher development of physical education teachers in local colleges and universities will be more active and self-conscious, which will reduce the influence of external environment on teachers' teacher development to a certain extent, and promote the transformation of physical education teachers' teacher development from passive to active state.

To sum up, the willingness for teacher development refers to the strong desire and motivation of individual teachers to continuously improve their teacher quality in a specific field, which is mainly reflected in two aspects: teacher emotion and teacher development motivation.

6.1.2 Literacy of teacher development

Zheng Yanxiang (1986) believes that the teacher quality of teachers exists in a structural form. The so-called teacher quality is regarded as "the set of knowledge, ability and belief that teachers possess and bring to the teaching situation. This is obtained through correct and strict teacher education on the basis of teachers' excellent preexisting characteristics".

Ye LAN (1998) pointed out that the structure of teacher quality includes teacher concept, knowledge structure and ability structure. Allen (1991) on the other hand, pointed out that teacher organizational structure includes subject knowledge, behavior skills and personality skills. Lin Ruiqin (1990) pointed out that the quality structure of teachers includes the knowledge of the subject taught, the knowledge of the education profession, and the spirit of education teacherism.

Meanwhile, Jao Jianwei (1996) pointed out that the teacher quality structure includes teachers' general knowledge, subject knowledge, educational specialty knowledge and educational teacherism. Yao Zhizhang (2000) pointed out that the structure of teacher quality includes cognitive system, affective system and operating system. Tang Songlin and Xu Houdao (2000) stated that teacher quality structure includes cognitive structure, teacherism and educational ability. Shao Linhai (2016) noted that teacher quality structure includes general literacy, educational concepts, teacher knowledge and skills, and practical ability. The Department of Teacher Education of Ministry of Education of the People's Republic of China (2001) stated that teacher quality structure includes teacher knowledge, teacher skills and teacher affection.

To sum up, teacher development literacy refers to the comprehensive performance of individual's general literacy, teacher literacy, practical literacy and educational concept literacy, which are constantly enriched and improved. It covers four aspects: general literacy, teacher literacy, practical literacy and educational concept literacy.

6.1.3 Teacher development approach

Lieberman and Mioller (1992) listed the more effective approaches to teacher development as teaching and learning groups, curriculum writing, participating in research, observing lectures, case analysis conferences, innovative educational practices, and establishing teacher resource centers. Guskey (2000) summarized seven approaches to teacher development, including training, classroom observation and evaluation, participation in the development or improvement process, study groups, inquiry or action research, individual-led activities and tutoring. Jao Jianwei (1996), a scholar from Taiwan, summarized and proposed two types of in-service teacher development approaches: passive development and reflective research. The passive development includes continuing study courses and practice counseling; Reflective research includes visits and observations, collaborative growth groups, collaborative action research, guided self-inquiry, general project research and individual-directed learning. Mitkovska (2010) classifies this into three forms: (1) Standardized Teacher Development (PTD). A centralized learning approach in which the implementers share skills and knowledge with a large number of teachers, often applied to the promotion of experienced teachers' experience; And (2) purposeful PTD. Under specific circumstances and conditions, it is often implemented in the training center of the school to achieve long-term changes in a heuristic way, and special tutors guide teachers in the course content and teaching skills, so as to improve teachers' teaching ability; And (3) individual PTD. It refers to the non-organized form of teacher development, in which individual teachers use available resources for independent learning, such as observation teaching, reading teacher literature, case study, etc. Richter (2011) classifies the approaches to teacher development into formal learning and informal learning. Lin Lin (2019) investigated the teacher development approaches of teachers of public basic courses in higher vocational colleges from four aspects: training content, training methods, training effects and training frequency. This is also a kind of classification method that this research tends to adopt.

To sum up, teacher development approach refers to the process and means by which individuals participate in various training activities to improve their knowledge, skills and teacher quality in a specific field. This concept mainly involves three key aspects: training methods, training funds and training effectiveness.

6.1.4 Teacher development policy

According to Zepeda (2018), teacher development policies can be understood as a series of regulations and guidelines designed to support and guide individuals or organizations to continuously improve their skills, knowledge and abilities in their teacher fields. The goal of these policies is to create an environment conducive to the career growth of individuals to ensure that they can adapt to changing needs and challenges. This may include training programs, educational support, evaluation mechanisms, promotion regulations for teacher titles, etc., to encourage and facilitate the teacher development of individuals or organizations. Ingersoll and Strong (2011) argue that policies may provide financial support to induce schools and educational institutions to provide more training and development opportunities. This helps teachers to continuously upgrade their teacher skills and knowledge. Hattie and Timperley (2007) argue that policies may provide for the establishment of effective teacher evaluation and feedback mechanisms so that teachers understand their strengths and areas for improvement. Lavy (2015) stated that some policies may include incentives, such as awards and promotions, to encourage teachers to engage in teacher development activities. Altbach, Reisberg and Rumbley (2009) believe that higher education policies have a profound impact on the teacher development of teachers in colleges and universities. Policies may involve curriculum design, teaching methods, subject development and scientific research support, etc., and directly affect teachers' teaching and research activities.

Lu and Li (2018) believe that the promotion system of teacher titles is an important part of the teacher development of college teachers. The standards and procedures for the evaluation of teacher titles in the policy directly shape the career development path of teachers in teaching, scientific research and service. Gmelch and Miskin (2004) noted that the performance evaluation system is another policy element that has a direct impact on teachers' teacher development. This system can provide teachers with a clear direction of development by evaluating the performance of teaching effectiveness, research output and academic service.

To sum up, teacher development policy refers to a series of guidelines, regulations and systems formulated and implemented in the field of higher education aimed at guiding and promoting teachers' overall teacher growth and career development. This concept mainly involves three key aspects: higher education policy, teacher title promotion system and performance appraisal system.

Therefore, the researcher summarized teacher development into 12 indicators taken from 22 literatures. The details are shown in Table 2.

Table 2 Components and Indicators of Teacher Development

Components	Indicators
1.Willingness for teacher development	1.1 Teacher emotion 1.2 Teacher development motivation
2.Literacy of teacher development	2.1 General literacy 2.2 Teacher literacy 2.3 Practical literacy 2.4 Educational concept literacy
3.Teacher development approach	3.1 Training methods 3.2 Training funds 3.3 Training effectiveness
4.Teacher development policy	4.1 Higher education policy 4.2 Teacher title promotion system 4.3 Performance appraisal system

6.2 Results of confirmation of the components and indicators for teacher development of local university physical education teachers.

The 5 well-known experts in the field of physical education management selected by the researcher to verify and evaluate the components and indicators of teacher development of local university physical education teachers confirmed the results in Table3 and Table 4.

Table 3: IOC and Level of Suitability of Components and Indicators of Teacher Development

Components and Indicators of Teacher Development	IOC	Level of Suitability
1.Willingness for teacher development	1	Suitable
1.1 Teacher emotion	1	Suitable

1.2 Teacher development motivation	1	Suitable
2.Literacy of teacher development	1	Suitable
2.1 General literacy	1	Suitable
2.2 Teacher literacy	1	Suitable
2.3 Practical literacy	1	Suitable
2.4 Educational concept literacy	1	Suitable
3.Teacher development approach	1	Suitable
3.1 Training methods	1	Suitable
3.2 Training funds	1	Suitable
3.3 Training effectiveness	1	Suitable
4.Teacher development policy	1	Suitable
4.1 Higher education policy	1	Suitable
4.2 Teacher title promotion system	1	Suitable
4.3 Performance appraisal system	1	Suitable

According to Table 3, all the Components and Indicators of teacher development of local university physical education teachers are Suitable.

Table 4: Feasibility of Components and Indicators of Teacher Development

Components and Indicators	\bar{X}	S.D.	Level of ability
1.Willingness for teacher development	4.78	0.33	very high
1.1 Teacher emotion	4.72	0.44	very high
1.2 Teacher development motivation	4.83	0.25	very high
2.Literacy of teacher development	4.73	0.39	very high
2.1 General literacy	4.65	0.46	very high
2.2 Teacher literacy	4.80	0.31	very high

2.3 Practical literacy	4.72	0.41	very high
2.4 Educational concept literacy	4.68	0.45	very high
3. Teacher development approach	4.71	0.44	very high
3.1 Training methods	4.71	0.44	very high
3.2 Training funds	4.65	0.47	very high
3.3 Training effectiveness	4.80	0.40	very high
4. Teacher development policy	4.75	0.35	very high
4.1 Higher education policy	4.75	0.34	very high
4.2 Teacher title promotion system	4.77	0.32	very high
4.3 Performance appraisal system	4.72	0.37	very high
Total average	4.74	0.38	very high

According to Table 4, all Components and Indicators of teacher development of local university physical education teachers are very high.

7. Conclusion and Discussion

7.1 Conclusion

7.1.1 Results of studying the components and indicators for teacher development of local university physical education teachers

The researchers extracted the concepts from 30 relevant literatures, and summarized the concepts with the same or similar meaning by consistency and correlation into 4 components and 12 indicators. Specific information on components and indicators as follows:

(1) Component 1: Willingness for teacher development consisted of 2 Indicators as follows: 1) Teacher emotion, 2) Teacher development motivation.

(2) Component 2: Literacy of teacher development consisted of 4 Indicators as follows: 1) General literacy, 2) Teacher literacy, 3) Practical literacy, 4) Educational concept literacy.

(3) Component 3: Teacher development approach consisted of 3 Indicators as follows: 1) Training methods, 2) Training funds, 3) Training effectiveness.

(4) Component 4: Teacher development policy consisted of 3 Indicators as follows: 1) Higher education policy, 2) Teacher title promotion system, 3) Performance appraisal system.

7.1.2 Results of evaluating the components and indicators for teacher development of local university physical education teachers

The 5 well-known experts in the field of physical education management selected by the researcher to evaluate the components and indicators of teacher development of local university physical education teachers, confirmed the results as follows:

All Components and Indicators of teacher development of local university physical education teachers are Suitable.

The feasibility of all Components and Indicators of teacher development of local university physical education teachers are very high.

7.2 Discussion

The researcher extracted the concepts from 30 relevant literatures, and summarized the concepts with the same or similar meaning by consistency and correlation into 4 components and 12 indicators. The 5 well-known experts in the field of physical education management selected by the researcher to verify and evaluate the components and indicators of teacher development of local university physical education teachers confirmed the results as follows:

7.2.1 Components of teacher development.

The analysis results of teacher development components are similar to the Research on Teacher Development of Chinese College Physical education Teachers (Guo Jiajun, 2019). The research points out that the teacher development of PE teachers relies on the teacher knowledge and content of PE subjects; Teachers' teacher development is closely related to their own teacher growth needs, which requires teachers' continuous active learning. The teacher development of PE teachers needs a perfect system to support and guide teachers to receive teacher training. It includes four components: teacher development quality (including teacher knowledge and content), teacher development willingness (including teacher growth needs or teacher development motivation), system and teacher training. In fact, the meaning of teacher training proposed in this study is also similar to that expressed by teacher development approaches.

7.2.2 Indicators of teacher development.

(1) Component 1: Willingness for teacher development consisted of 2 Indicators as follows: 1) Teacher emotion, 2) Teacher development motivation.

The analysis results of teacher development intention are similar to the Research on the Teacher Development of local University physical education Teachers (Shao Linhai, 2016). The study points out that the willingness of teachers to develop teacherly is the internal cause, and the influence on the teacher development of PE teachers is fundamental. If teachers themselves lack the will of teacher development and cannot regard teacher development as their internal needs,

then even with good policies and perfect training systems, the teacher development of local physical education teachers in colleges and universities is difficult to show continuity and stability, and their teacher level may not be improved for a long time. At the same time, it is pointed out that teacher emotion and intrinsic motivation are the organic components of college PE teachers' profession. As far as teacher emotion is concerned, for a long time, driven by technical rationality, teachers' teacher development has focused on the training of teachers' teacher skills, ignoring the cultivation of teachers' emotions. However, teachers generally lack the humanistic feelings and spirit of education, and it is difficult to promote the formation of students' sound personality. In fact, teachers' teacher feelings are very important. Good teacher feelings can not only guide teachers to form a correct education outlook, student outlook and career outlook, but also help teachers learn to correctly understand themselves and properly express their feelings, so as to promote the smooth development of their education and teaching work. In real life, teachers' teacher emotions can be divided into positive emotions and negative emotions, but because education is a social activity to cultivate people. Therefore, this determines that in the process of education, teachers should have more positive emotions, which is the same for PE teachers.

The positive emotion of PE teachers is mainly reflected in the choice of attitude towards themselves, students and work. The positive feelings towards oneself are mainly to be able to correctly understand their own strengths and weaknesses, to be able to treat their imperfections and the suggestions of others as usual, and then to carry forward their own advantages with a positive attitude, overcome their shortcomings, and enhance teacher confidence and teacher self-knowledge. The positive emotion of students is mainly to have a correct understanding of the development of students, to realize the important position of physical education in the process of learning formation and development, and to establish an all-round development of students' view and education view. The positive feelings towards work are mainly that physical education teachers should truly identify with the profession of teachers, love the work of physical education, and treat education and teaching seriously and conscientiously. As the core component of teachers' psychological factors, teacher motivation is closely related to teachers' teaching practice, and teachers' teaching practice is closely related to learners' academic achievement.

The motivation of PE teachers' teacher development is divided into internal motivation and external motivation, and the enhancement of external motivation mainly depends on some material and policy incentives. Because these incentives have a great deal of chance, extrinsic motivation will be greatly affected by the external environment and may show large fluctuations. In contrast, the enhancement of intrinsic motivation is related to teachers' personal cognition and personal values. Because these contents are not easy to change once formed. Therefore, intrinsic motivation is less influenced by external environment and it is relatively stable. It is for this reason that intrinsic motivation is more controllable and lasting in the motivation of teachers' teacher development. Internal motivation will have a significant impact on the teacher development of teachers. With the incentive effect of internal motivation, the teacher development of physical education teachers in local colleges and universities will be more active and conscious, which will

reduce the influence of external environment on the teacher development of teachers to a certain extent, and promote the change of teacher development of physical education teachers from passive to active.

This paper divides willingness for teacher development into teacher emotion and teacher development motivation, and sets up 5 questionnaire questions for teacher emotion index and 7 questionnaire questions for teacher development motivation index. These questionnaire questions can effectively help us to understand the current situation of the teacher development of physical education teachers in local universities in Guangxi.

(2) Component 2: Literacy of teacher development consisted of 4 Indicators as follows: 1) General literacy, 2) Teacher literacy, 3) Practical literacy, 4) Educational concept literacy.

The analysis results of teacher development literacy are similar to the Research on the Teacher Development of local University physical education Teachers (Shao Linhai, 2016). The study points out that the structure of teachers' quality includes general literacy, educational concept, teacher knowledge and skills, and practical ability.

This paper replaces the teacher knowledge and skills mentioned in the above research with "teacher literacy" indicators, that is, teacher development literacy includes general literacy, teacher literacy, practical literacy, and educational concept literacy, and sets 7 questionnaire questions for general literacy indicators, 14 questionnaire questions for teacher literacy indicators, and 12 questionnaire questions for practical literacy indicators. Five questionnaire questions were set up for the educational concept literacy index. These questionnaire questions can effectively help us to understand the current situation of the teacher development of physical education teachers in local universities in Guangxi.

(3) Component 3: Teacher development approach consisted of 3 Indicators as follows: 1) Training methods, 2) Training funds, 3) Training effectiveness.

The analysis results of teacher development approaches are similar to the Research on Teacher Development of Teachers of Public Basic Courses in Higher Vocational Colleges (Lin Lin, 2019). This study investigates the teacher development path of public basic course teachers in higher vocational colleges from four aspects: training content, training mode, training effect and training frequency.

In this paper, the four aspects mentioned above are summarized into three indicators: training method, training fund and training effect, and 7 questionnaire questions are set for the training method index, 4 questionnaire questions are set for the training fund index and 3 questionnaire questions are set for the training effect index. These questionnaire questions can effectively help us to understand the current situation of the teacher development of physical education teachers in local universities in Guangxi.

(4) Component 4: Teacher development policy consisted of 3 Indicators as follows: 1) Higher education policy, 2) Teacher title promotion system, 3) Performance appraisal system.

The analysis results of teacher development policy are similar to the comprehensive analysis results of Ingersoll (2011), Lu (2018), and Gmelch (2004). Ingersoll and Strong (2011) argue that policies may provide financial support to encourage schools and educational institutions to provide more training and development opportunities. This helps teachers to continuously upgrade their teacher skills and knowledge. Lu and Li (2018) believe that the teacher title promotion system is an important part of the teacher development of college teachers. The standards and procedures for the evaluation of teacher titles in the policy have directly shaped the career development path of teachers in teaching, scientific research and service. Gmelch and Miskin (2004) believe that the performance appraisal system is another policy element that has a direct impact on teacher development. Such a system can provide teachers with a clear direction for development by assessing their performance in teaching effectiveness, research output and academic services.

This paper summarizes the three aspects mentioned above into three indicators of "teacher development policy": higher education policy, teacher title promotion system and performance appraisal system, and sets four questionnaire questions respectively for higher education policy indicators, seven questionnaire questions for teacher title promotion system indicators, and five questionnaire questions for performance appraisal system indicators. These questionnaire questions can effectively help us to understand the current situation of the teacher development of physical education teachers in local universities in Guangxi.

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