A Study on Informatization Teaching Efficacy in Higher Vocational Education in Guangzhou, China

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Abstract: China has been vigorously promoting the construction and development of Informatization teaching efficacy education. Informatization teaching efficacy was used as an indicator of the psychological state of teachers. This article analyzes relevant literature at home and abroad and determines the five dimensions that affect teachers’ informatization teaching efficacy in informatization teaching.

Keywords: Informatization Teaching Efficacy; Teaching efficacy; Higher vocational institution teachers

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1. Introduction

Educational development has always been a priority in China, and the country has proposed a series of educational reform policies to support the multimedia teaching environment. Multimedia information-based teaching environment is an inevitable trend in future education. Information-based teaching has become a necessary skill for teachers, and multimedia information-based teaching has also been highlighted. The national education curriculum reform has not only changed teaching methods but also affected the teachers’ psychology. In this paper, Informatization teaching efficacy was used as an indicator of the teachers’ psychological state. Informatization teaching efficacy was evaluated based on subjective evaluation, confidence in their abilities, and teaching effect under the background of informatization teaching efficacy. Relevant literature at home and abroad was analyzed to determine the five dimensions that affect informatization teaching efficacy. The five dimensions were teaching attitude, course design, teaching strategies, self-improvement, and classroom management.

2. Problem statement

Informatization teaching efficacy refers to a teacher’s self-evaluation in the teaching process: how well he/she can complete the teaching tasks. Informatization teaching efficacy plays an essential role in the professional development of higher vocational teachers [¹]. It is affected by two factors: The self-confidence and the
psychological state of teachers; the second factor is the impact of the teachers’ psychology on students.

Through questionnaire research, it was found that informatization teaching efficacy in middle schools in terms of political and ideological education is affected by the teaching attitude. The more positive their attitudes are, the more effective informatization teaching efficacy will be. It was also found that the teacher’s gender and personality, work efficiency, the teaching attitude, the course design, the teaching environment, the students’ quality, the school’s management and curriculum standards, etc., also affect classroom teaching behaviors.

Some teachers lack experience and understanding of their students, so they are not confident. However, as they try out different teaching methods, get feedback from the students, and continue to improve their work, they will gradually establish a set of effective teaching modes.

A higher teaching efficacy score indicates more diversified teaching strategies used in class in dealing with students’ learning problem behaviors.

Studies have shown that promoting the independent development of teachers will help improve informatization teaching efficacy. The higher the degree of autonomy of teachers is, the stronger their sense of responsibility will be.

According to a survey conducted in the University of Arizona on the basic qualities required of 111 international Chinese teachers and volunteers in the United States, 97.3% of them said that classroom management ability was the most important quality. This shows that classroom management is one of the most crucial abilities a teacher must have.

A large number of studies at home and abroad have shown that informatization teaching efficacy not only has a positive impact on teaching behaviors, teaching strategies, teaching effects, student achievements, and student development, but also has an important impact on teachers’ mental health, career development, and personal development.

The construction of multimedia informatization teaching efficacy environments has become the only way for China to develop Smart education. In China, colleges and universities across the country provide various training programs to improve their teachers’ abilities in informatization teaching efficacy. As the country undertakes educational reform, teachers are facing more pressure and challenges. Informatization teaching efficacy being one of the psychological indicators is closely related to teaching activities and the teachers’ personal development. As of now, there have been few studies on informatization teaching efficacy in vocational school teachers in China. Therefore, there is a need to study informatization teaching efficacy in a multimedia teaching environment.

The purpose of this study was to explore the effect of teaching attitude, course design, teaching strategies, self-improvement, and classroom management on informatization teaching efficacy in higher vocational institutions in Guangzhou, China.

2.1. Informatization Teaching Efficacy

Information technology is ever-evolving, introducing new tools, platforms, and applications all the time. Therefore, keeping up with these new technologies and assessing their impact on teaching efficacy presents a new challenge.

Informatization teaching efficacy is the intrinsic motivation of teachers’ ability development. It can not only reflect the confidence and qualities of the teachers, but also predict students’ learning outcomes. Hence, informatization teaching efficacy has become an important indicator of a teacher’s competency.

Teachers with strong efficacy exhibit an increased enthusiasm for teaching, a strong commitment to their profession, a positive influence on student achievement, and an increased level of persistence. They consider
new situations as challenges and do not give up\textsuperscript{[7]}.

Armor and Berman were among the early researchers who studied instructional efficacy as part of the “Teacher Effectiveness Evaluation Research” project, which later attracted the attention of many scholars\textsuperscript{[8]}. As a result, the theory of teaching efficacy has been well-established. Teaching efficacy is theoretically derived from Rotter’s control point theory and Bandura’s self-efficacy theory.

Teaching efficacy can affect a teacher’s emotional regulation; thus, it will also affect their work quality, ultimately affecting students’ learning efficacy\textsuperscript{[9]}.

A study was done on the relationship between informatization teaching efficacy and the attitudes of teachers using computer-aided design as an example. The results showed that teaching efficacy was positively correlated with the teachers’ attitudes\textsuperscript{[10]}.

Besides the influence of information technology on informatization teaching efficacy has also been studied. In the study, it was pointed out that modern education not only changed teaching methods but also had a subtle influence on the teachers’ psychology\textsuperscript{[11]}. Information technology plays a role in informatization teaching efficacy. Information technology affects informatization teaching efficacy in four ways: performance/achievement, use experience, verbal persuasion, and emotional stimulation. Meanwhile, the application of information technology also affects informatization teaching efficacy. Thus, there is a relationship between teaching attitude, course design, teaching strategies, self-improvement, classroom management, and informatization teaching efficacy.

Only a few studies examined the five factors (teaching attitude, course design, teaching strategies, self-improvement, and classroom management) altogether. Therefore, the purpose of this study was to study the impact of five different influencing factors on the teachers of higher vocational institutions in Guangzhou. The teaching efficacy will be evaluated based on the aforementioned indicators.

2.2. Teaching attitude

Teaching attitude is an important factor that affects informatization teaching efficacy. Teaching attitude directly reflects the informatization teaching efficacy of teachers. If teachers are professional and positive, the teaching effects would be better. If a teacher is irresponsible, the relationship between the teacher and his/her students will be affected, leading to low teaching efficacy. Therefore, it is important to study how teaching attitude affects informatization teaching efficacy.

Mark Bray came to a frightening conclusion: “Teachers” are the decisive factor in the success or failure of education\textsuperscript{[12]}. Teachers have tremendous power to make children’s lives happy or miserable. They can be instruments of pain or a medium of inspiration. They can embarrass or delight, hurt or save. He said that when the teacher walks into the classroom with a smiley face, the students will be very comfortable and relaxed; if the teacher approaches them with an angry face, the students will keep quiet as they are afraid of agitating the teacher. When students in the classroom are affirmed and encouraged, they become very excited; when the teacher is sarcastic and cynical, the students will be disheartened. It can be seen that the teacher’s attitude plays a very important role in students’ learning.

Certain teaching methods are favored by teachers because of their stability and clarity\textsuperscript{[13]}. The online attitude that teachers should adopt in a virtual classroom has been studied. It has been pointed out that online education will not only the teaching methods but also the teachers’ understanding of the meaning of teaching\textsuperscript{[14]}.

There are two categories of teaching attitudes. The first one can be divided into positive teaching attitude and negative teaching attitude\textsuperscript{[15]}. A positive teaching attitude is a correct understanding of students’ ideological cognition, ability, and personality. A teacher with a positive attitude can stimulate students’ interest in learning.
However, a negative teaching attitude will hinder the improvement of teaching quality and the overall development of students’ body and mind.

Teaching attitude can also be divided into three elements: the teachers themselves, the attitude towards their students, and the teaching content. As the goal of education shifts from being exam-oriented to focusing on the quality of education, teachers should strive to improve themselves and emphasize cultivating their students’ creativity.[16] Besides, the teachers should also be patient when teaching their students. Strictly speaking, the elements of teaching attitudes should be far more than these three, it should also include teaching methods. On the other hand, building upon the understanding of teaching elements as teachers, students, and teaching activities (or educational influences), teaching attitudes can be described as a teacher’s attitudes towards their career, students, and teaching activities. Incidentally, a teacher’s attitude towards their teaching activities (or educational influences) directly affects their work quality. Therefore, it can be clearly said that there are omissions in the classification of teaching attitudes that are just based on three elements.

2.3. Course design
Course design refers to the organization of the curriculum, including the foundation of the curriculum, the organizational methods and skills of its elements, and the evaluation of the curriculum plan. The concepts related to course design include curriculum organization, curriculum development, curriculum preparation, curriculum construction, and so on.

The purpose of course design is to transform the requirements of social development, the trend of knowledge growth, and students’ needs into a course, with suitable standards, content, and structure. The most common form of course design is to arrange the components or elements of a course. The components or elements in a course usually include the objectives, the content, the learning activities, and the methods of evaluation. Therefore, the combination of these elements into a unified course organization constitutes course design. Therefore, this study also intended to find out how course design affects informatization teaching efficacy.

Course design also refers to the organizational form or structure of the curriculum, that is, the arrangement of various factors of the curriculum.[17] Course design can be based on two aspects: theoretical basis and method and technology. The so-called theoretical basis mainly refers to the three foundations of course design: discipline, students, and society. The so-called method and technology refers to the arrangement of curriculum factors according to the theoretical basis. Curriculum factors are often referred to as objectives, content, activities, and evaluation.

Course design is the key to the curriculum reform of vocational education, which will make the education system more systematic.[18] The formation of a “functional structure” can be viewed as a systematic learning resource formed by learners in various “pre-education materials” rather than strengthening the development of professional skills.[19]

Wang asserts that the Design model course is a representation of how course design operates in reality or as an illustration of the ideal operation.[20] Its purpose is to introduce, communicate, or demonstrate the blueprint of course design to guide forthcoming course design actions. Course design is the process of transforming social development requirements, knowledge, and students’ needs into course contents that meet students’ level of physical and mental development and logical order of knowledge.

Shi made a detailed distinction between course design and course development.[21] In his opinion, the connotation of course development is greater than that of course design. Course design only includes the establishment of course objectives and the selection and organization of course content.

According to Jiang, course design refers to the formulation of the structure of a course, which depends on
the decision-making at two different levels \cite{22}. The broad level includes determining the fundamental values of the course, and the specific level includes the utilization of different technologies and the execution of the curriculum elements.

Cong suggests that course design involves designing each aspect, categorized into macro, medium, and micro levels \cite{23}. These three levels of course design are both independent and intrinsically interconnected.

### 2.4. Teaching strategies

Teachers ought to adapt their teaching methods based on their students’ responses, create personalized teaching strategies, critically review each teaching phase, maintain reflective diaries, and analyze and summarize their teaching experiences regularly. This iterative process aims to continually enhance teachers’ effectiveness in utilizing information technology for teaching. During classroom sessions, a pivotal responsibility for teachers is to sustain the flow of the teaching process. When encountering a situation where the teaching process stalls, teachers should draw upon routine practices, recall past experiences to address the issue, and dynamically make interactive decisions based on evolving circumstances. Creatively implementing effective solutions is essential to re-energize the classroom and ensure seamless continuation of the teaching activities \cite{24}. Therefore, it is important to find out how teaching strategies affect informatization teaching efficacy.

Teacher needs to consider two factors when making planning decisions: the resources they have and the constraints they are subjected to. The abundance of resources will affect the decision-making process of the teachers. This includes the teaching experience and the external resources available such as books, materials, and teaching equipment. The more resources teachers have, the more choices they have when making decisions, which allows more possibilities. On the contrary, fewer resources allow fewer choices. The restrictive factors come from the environment, the situation of students, the teachers; beliefs, and other aspects. For example, students’ level of English will affect the teachers’ decisions on activity organization, task selection, evaluation methods, and other aspects.

Teaching strategies could be divided into three dimensions \cite{25}: pre-class strategy, in-class strategy, and after-class strategy. Teaching strategies can also be understood as a series of problem-solving behaviors adopted by teachers to achieve teaching objectives \cite{26}. Shi defines instructional strategies are relatively systematic actions taken in the teaching process to the teaching objectives \cite{27}. Another scholar defines teaching strategies are a series of processes in which teaching activities are adjusted in order to achieve the teaching goals \cite{28}.

Zhou stated that teaching strategies are systematic decision-making activities carried out by teachers in order to achieve teaching objectives \cite{29}. Che pointed out that teaching strategies are a new field and hot spot in instructional psychology research \cite{30}. In a broader scope, instructional strategies encompass both teaching strategies and learning strategies. However, in a narrower context, instructional strategies specifically pertain to teaching strategies, constituting an integral part of instructional design. They are tailored to particular teaching scenarios to achieve teaching objectives and accommodate students’ cognitive needs. This involves the development of teaching procedures and measures for teaching implementation.

### 2.5. Self-improvement

High teaching efficacy promotes teachers’ self-improvement. Teaching efficacy is manifested in teachers’ belief that they can influence their students. In this way, the teachers will have a mindset of wanting to improve themselves instead of just being forced by external circumstances. A strong sense of informatization teaching efficacy boosts teachers’ confidence and validates their professional worth. It also enables them to assess their personality values objectively and receive precise guidance, stimulating their teaching
motivation and fostering ongoing reflection, adjustment, enrichment, and personal development for continuous improvement[31]. Self-improvement refers to the awareness that a teacher has of improving his/her competency, professional identity, achievements, and work efficiency.

Self-improvement has been repeatedly shown to be a relevant factor for the effectiveness of teaching activities, as it is a powerful driving force influencing classroom behavior and teaching efforts. Therefore, self-improvement is crucial in terms of ensuring teachers’ mental health and job satisfaction and students’ academic performance[32].

Hoy and Woolfolk believe that teacher self-improvement is a development process in which teachers improve their professional knowledge and skills at every stage of their career[33]. Fives et al. proposed the connotation of teacher self-improvement from another perspective[34]. He believed that teacher self-improvement is not about the individual learning and development process of teachers throughout their careers. At the same time, it is also the result of teachers’ experience in dealing with spatial and temporal situations.

Another researcher believed that teacher self-improvement means that teachers carry out tasks and activities according to their wisdom in their field without external intervention from non-professional sources[35]. Yao emphasized that teachers should have strong awareness and motivation to improve themselves[36]. Self-development can be achieved through independent reflection, self-renewal, design and plan formulation, implementation and regulation of professional development direction, etc. He also pointed out that independent development is the inner core factor of teacher professional development, and autonomy is the inner driving force of teacher professional development.

Yang et al. believed that the key to teachers’ self-improvement lies in improving the awareness of professional development[37]. It lies in teachers’ independent and active pursuit of self-development and professional development.

Sui found that college teachers have the lowest “perceived ease of use” of informatization teaching efficacy[38]. Therefore, colleges and universities can improve teachers’ perception of informatization teaching efficacy by enriching their experience in using it. Various types of school-level teaching development projects can be organized to increase teachers’ practical experience in informatization teaching efficacy. In this way, teachers would get to understand the usefulness of technology in improving teaching efficiency and effectiveness, which would improve their willingness to use informatization teaching efficacy, which in turn improves the teachers’ proficiency in informatization teaching efficacy. There are various forms of teacher development projects in colleges and universities, such as informatization teaching efficacy training, teaching competitions, teaching supervision, educational technology competitions, micro-class competitions, etc. These activities are all ways to improve teachers’ informatization teaching efficacy capabilities.

2.6. Classroom management

A researcher adopted a teaching potency scale with six dimensions, including course design, teaching strategies, technology use, classroom management, interpersonal relationships, and learning assessment[39]. A survey has been conducted on the teaching efficacy of 678 primary and secondary school teachers working in Tokat in terms of gender, curriculum matching, in-service training, work experience, etc. The results showed that the teachers were most competent in terms of classroom management. The followed by course design, interpersonal skills, learning assessment and technology use, and teaching strategies. The survey revealed that in higher vocational classes, misuse of multimedia equipment, improper use of self-help slogans, neglect of warning signs and safety gear, as well as neglect of the physical and psychological classroom environments, contribute
to issues such as classroom restriction and rigidity, indifference in teaching methods, and a lack of attention to improving the classroom’s psychological environment. Furthermore, there are observed problems related to the mismatch between students’ life experiences and institutional environments. Therefore, it is crucial to study how classroom management affects informatization teaching efficacy.

Friedman and Farber found that teachers who thought they were poor in classroom discipline and management reported higher levels of job burnout than those who thought they were better.

Lu mentioned in their discussion on the influence of teacher factors on classroom management that good discipline is the fundamental guarantee for the establishment of an orderly learning environment, in which teachers, as the organizers and managers of classroom teaching, play a key role.

Jones et al. pointed out that classroom management should go beyond “student discipline,” and all things that teachers do to promote students to participate in classroom activities with concerted efforts and create a vibrant and fruitful teaching environment belong to classroom management.

In a cross-sectional study of Dutch teachers, Brouwers and Tomic found that a high level of student sabotage leads to a low level of self-efficacy in classroom management, and a low level of self-efficacy in classroom management leads to a higher level of teacher burnout. Conversely, a higher level of teacher burnout will lead to a higher level of students’ destructive behavior, which will further reduce teachers’ self-efficacy.

Jalili et al. conducted a study from the perspective of teachers’ personalities and believed that extroverted teachers could control the classroom better than introverted teachers in adult foreign language learning.

Zhou et al. believe that classroom management includes classroom discipline management, information management, operation regulation, and time management.

Yan et al. believe that classroom management includes three aspects: establishing classroom routines, dealing with classroom problematic behaviors, and creating a good classroom teaching situation.

3. Conclusion

In this study, literature regarding informatization teaching efficacy, teaching attitude, course design, teaching strategies, self-improvement, and classroom management were analyzed.

In summary, this study aims to contribute to the research on the effectiveness of information-based teaching of higher vocational teachers in Guangzhou. It is of practical significance for higher vocational teachers to adapt to the information-based teaching environment, improve the efficiency of information-based teaching, make full use of information technology to improve teaching quality, and promote teachers’ personal development.

Disclosure statement

The authors declare no conflict of interest.

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