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Informatization teaching ability, satisfaction, and effectiveness among Chinese computer teachers

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Abstract

The participants of this study are teachers of computer science majors in three universities in China, namely, Guangzhou University, Guangzhou Normal University, and Guangzhou College of Commerce and Industry totaling 3,000 people. Respondents will be randomly selected from the school faculty of 341 using SPSS statistical software to ensure that the respondents are computer science majors in the school. The total number of respondents for this study was revised and confirmed by the professors to be 425. This purpose of this study is to determine informatization teaching competency, job satisfaction, and effectiveness among Chinese Computer ability Teachers. Specifically, this study will describe the age, sex, and educational background, determine the respondent's informatization teaching ability in terms of Capability, Teaching and Learning, and Design Capability; assess the respondent's teaching satisfaction in term of Capacity Utilization and Promotion, School Management, Wages and Benefits; explore the respondents' teaching effectiveness in terms of Teaching Effect, Teaching Methods and Interaction; test for differences in responses when grouped according to profile; test the significant relationship Among informatization teaching ability, and satisfaction and effectiveness; and propose a faculty development program for computer teachers in Chinese universities. Most respondents are male, aged between 31-45 years, with a Master's degree as their highest educational attainment, and have work experience generally ranging from 6-9 years. Most respondents believe that Capability and Teaching and Learning are the most useful dimensions for Informatization Teaching Ability. Most respondents consider that in Teaching Satisfaction, Wages and Benefits and School Management are rated the highest. Most respondents think that in Teaching Effectiveness, Teaching Effect and Teaching Methods and Interaction perform significantly better than other categories. Significant relationships exist between informatization teaching competence, satisfaction, and effectiveness. Proposed a program for the development of computer teachers in Chinese colleges and universities. The Government may increase its financial support for educational technology, including capital investment for the purchase of advanced teaching equipment and software. At the same time, special training centers should be established to help teachers

improve their IT teaching skills. Teachers may practice the information technology teaching skills they have learned in their daily teaching and regularly reflect on their teaching practices to find ways to improve them. Students may provide feedback to teachers about the effectiveness of informationalized teaching and help them improve their teaching methods. Create an online platform for teachers to share and access teaching and learning resources, including curriculum design, teaching videos and interactive software. This platform can also be used for exchanges and discussions among teachers to enhance the openness and interactivity of teaching. Prospective researchers are encouraged to conduct interdisciplinary studies to explore the relationship between informationalized teaching and student learning outcomes, and how to enhance teachers' teaching satisfaction and self-efficacy through informationalized means.

Keywords: teaching ability, satisfaction, teaching effectiveness, computer teachers, Chinese student

Informatization teaching ability, satisfaction, and effectiveness among Chinese computer teachers

1. Introduction

The rapid development of computer science and technology has made possible the wide application of information technology in modern education. In China, computer education is of great significance as one of the important contents of education reform and development. However, Chinese computer teachers' information technology teaching ability, satisfaction and teaching effectiveness have always been of great concern. In today's highly developed information technology, computer teachers' informatization teaching ability is becoming more and more important and plays a vital role in improving teaching quality and effect. However, the informatization teaching ability of computer teachers in China is still facing certain challenges and needs to be further studied and improved. In addition, teacher satisfaction, as an important educational variable, plays an important role in teacher teaching quality, educational investment, and school management. Computerized teacher satisfaction research is closely related to social sciences and needs to be further explored. In addition, the effectiveness of information technology teaching is also a hot research topic. Studying computer teachers' satisfaction and the effectiveness of information technology teaching is of great significance for improving teachers' teaching quality and students' learning outcomes. Therefore, exploring Chinese computer teachers' information technology teaching ability, satisfaction and effectiveness is an important topic in current computer education research.

Informatized teaching ability refers to the ability of teachers to use information technology tools and resources for teaching and learning. This includes proficiency in a variety of teaching software, online platforms, and digital resources, as well as the ability to flexibly use these technologies for curriculum design, teaching implementation, and student assessment. Chen et al. (2019) showed that teachers with good Informatized teaching ability are able to effectively utilize modern technology to enhance the quality and effectiveness of their teaching and make it more lively, interactive, and better able to personalize to meet students' learning needs.

Satisfaction refers to the extent to which Chinese computer teachers recognize and enjoy teaching with IT. Jabbari (2018) showed that satisfaction increases when teachers feel that IT can improve teaching efficiency, stimulate students' interest in learning, and reduce their teaching load. On the contrary, if the technology is complicated and unstable to use, or lacks necessary support, teachers' satisfaction will decrease. The level of satisfaction directly affects teachers' commitment and motivation to teaching, which in turn affects the quality and effectiveness of teaching. Therefore, understanding and improving teachers' satisfaction is crucial to promoting the development of informatized teaching ability and the improvement of teaching effectiveness.

Teaching effectiveness refers to the results achieved by Chinese computer teachers in teaching information technology. Teaching effectiveness is a direct reflection of the quality of a teacher's teaching and the effectiveness of his/her teaching methods. A teacher with a high level of IT teaching competence is usually able to create a more engaging, interactive, and personalized teaching environment that promotes active student participation and improved learning outcomes. Wang (2018) showed that by assessing the effectiveness of teaching and learning, it is possible to gain a comprehensive understanding of the actual impact of IT in the teaching and learning process, which provides an important reference to optimize the teaching strategies and improve the quality of teaching and learning.

Informatization teaching competence has a significant impact on satisfaction and teaching effectiveness. Liu et al. (2020) showed that a teacher with a high level of informatization teaching competence is usually able to better apply information technology tools and resources, improve teaching efficiency, and stimulate students' interest in learning, which in turn enhances teachers' satisfaction with information technology teaching. At the same time, a teacher's IT teaching ability also has a direct impact on the effectiveness of teaching and learning,

and can create a more attractive and interactive teaching and learning environment to enhance students' learning outcomes. However, there is a certain gap in reality. The informatization teaching ability of some computer teachers may be insufficient, which leads to unsatisfactory teaching results and affects the improvement of satisfaction. In addition, even if the teachers have high information technology teaching ability, if the teachers do not have enough support for information technology teaching or if there are limitations in the teaching environment, it will also affect the actual enhancement of the teaching effectiveness, which in turn affects the level of satisfaction. Therefore, in order to improve teaching effectiveness and teacher satisfaction, it is necessary to continuously strengthen the cultivation of teachers' information technology teaching ability and to improve the teaching environment by providing better technical support and resources, so as to ensure that information technology teaching can really play its role and improve the quality of education.

Currently, there are still some gaps in research on informatization teaching ability, satisfaction and teaching effectiveness among Chinese computer teachers. These include the lack of empirical research on teachers' practical application of information technology, in-depth exploration of the relationship between satisfaction and teaching effectiveness, and comprehensive evaluation of teaching effectiveness.

Studying the informatization teaching ability, satisfaction and teaching effectiveness of Chinese computer teachers is of great significance. Firstly, it helps to fully understand the current situation and challenges of Chinese computer teachers in the application of international information technology, and provides a scientific basis for teacher training and education policy making. An in-depth study of the relationship between these factors can guide teachers to more effectively use information technology to improve the quality and effectiveness of teaching and promote the modernization of education. Ultimately, by optimizing teachers' information technology teaching ability and satisfaction, we can better meet students' learning needs, improve the quality of education, and cultivate high-quality talents adapted to the information age.

Objectives of the Study - The purpose of this study was to determine informatization teaching competency, job satisfaction, and effectiveness among Chinese computer teachers. Specifically, this study determined the respondents' informatization teaching ability in terms of Capability, Teaching and Learning, and Design Capability; assessed the respondents' teaching satisfaction in terms of Capacity Utilization and Promotion, School Management, and Wages and Benefits; explored the respondents' teaching effectiveness in terms of Teaching Effect, Teaching Methods, and Interaction; tested the significant relationship among informatization teaching ability, satisfaction, and effectiveness; and proposed a faculty development program for computer teachers in Chinese universities.

2. Methods

Research Design - This study utilized a descriptive research methodology aimed at exploring the relationships between Chinese computer teachers' IT teaching competence, satisfaction, and teaching effectiveness. To gain a comprehensive understanding of these relationships. Descriptive research method is a "method used to systematically characterize a group or phenomenon and does not involve the exploration of causality". This approach is applicable to this study because it can help us to paint a detailed picture of Chinese computer teachers' IT teaching competence and assess the relationship between their satisfaction and teaching effectiveness. In the quantitative research phase, data were collected by distributing valid questionnaires to computer teachers in different universities. Through statistical analysis, the study explored the correlation between the variables of computer teaching ability, satisfaction, and teaching effectiveness. This provided objective quantitative data for a more comprehensive understanding of the current situation of computer teachers in China in terms of computerized teaching and the potential relationship between different factors.

Participants of the Study - The participants of this study are teachers of computer science majors in three universities in China, namely, Guangzhou University, Guangzhou Normal University, and Guangzhou College of Commerce and Industry totaling 3,000 people. Respondents will be randomly selected from the school faculty of

341 using SPSS statistical software to ensure that the respondents are computer science majors in the school. The total number of respondents for this study was revised and confirmed by the professors to be 425. When determining sample size, effect size, power size, and confidence level need to be considered. Effect size refers to the size of the effect that the study hopes to detect and is usually determined based on similar studies in the past or the expectations of the researcher. The power size indicates how well the study has the ability to detect the true effect and is usually set around 0.8. The confidence level is usually set at 95%, indicating that if a similar study were repeated 100 times, 95 times it would come up with conclusions that are consistent with the overall picture. Therefore, these parameters need to be specified when designing a study and the required sample size calculated accordingly.

Data Gathering Instrument - The adapted instrument for this study contained four main sections: a demographic section and three questionnaire instruments. In the demographic section, participants were asked to respond to their sex, age, educational background, and work experience. The second part of the adapted tool is On the Informatization Teaching Ability, which is a combination of the Teacher Informatization Teaching Competency Questionnaire and Questionnaire on Teachers' Informatization Teaching Ability is a multidimensional questionnaire developed by combining the Teacher Informatization Teaching Competency Questionnaire and the Questionnaire on Teachers' Informatization Teaching Ability, which contains three dimensions, Capability, Teaching and Learning, and Design Capability, with a total of 32 items. The third part of the adapted tool is On Teaching Satisfaction, a multidimensional questionnaire developed by the Teacher Job Satisfaction Survey, which contains three dimensions of Capacity Utilization and Promotion, School Management, Wages and Benefits, with a total of 20 items. The fourth part of the adapted instrument is On Teaching Effectiveness, a multidimensional questionnaire developed by Teacher Effectiveness Questionnaire, which contains two dimensions, Teaching Effect, Teaching Methods and Interaction, with a total of 22 items. , a total of 22 items.

Table 1

Reliability Testing

Indicators	Cronbach Alpha	Remarks
Capability	0.967	Excellent
Teaching and Learning	0.970	Excellent
Design Capability	0.943	Excellent
Capacity Utilization and Promotion	0.919	Excellent
School Management	0.943	Excellent
Wages and Benefits	0.939	Excellent
Teaching Effect	0.952	Excellent
Teaching Methods and Interaction	0.969	Excellent

George and Mallery (2003) provide the following rules of thumb: "_ > .9 – Excellent, _ > .8 – Good, _ > .7 – Acceptable, _ > .6 – Questionable, _ > .5 – Poor, and _ < .5 – Unacceptable"

The table presents the Cronbach Alpha values for various indicators related to teaching effectiveness, capability, and satisfaction among computer teachers. Cronbach Alpha is a measure of internal consistency, or how closely related a set of items are as a group. It's often used as a reliability indicator of surveys and questionnaires. In this context, all the indicators listed—Capability, Teaching and Learning, Design Capability, Capacity Utilization and Promotion, School Management, Wages and Benefits, Teaching Effect, and Teaching Methods and Interaction—have shown Cronbach Alpha values above 0.9, indicating an "Excellent" level of reliability. This suggests that the questions or items used to measure each of these domains are highly consistent and provide a reliable measure of each construct. High reliability is crucial for ensuring that the findings of the study are based on stable and accurate measures, allowing for a more trustworthy interpretation of the relationship between teachers' IT teaching competence, satisfaction, and teaching effectiveness.

Data Gathering Procedure - The quantitative data were obtained by distributing the questionnaire to a random or convenience sampled group of teachers through the Questionnaire Star online platform and collecting responses via email or social media as well as the WeChat platform. Afterwards, the relationship between the

three variables was comprehensively assessed through statistical analysis of the questionnaire data and content analysis of the interviews in order to reveal their dynamic interactions and impacts.

Data Analysis - Weighted mean and ranking was used to determine the respondent's informatization teaching ability in terms of capability, teaching and learning, and design capability; assess the respondent's teaching satisfaction in term of capacity utilization and promotion, school management, wages and benefits; and explore the respondents' teaching effectiveness in terms of teaching effect , teaching methods and interaction; Pearson's r was used to test the significant relationship Among informatization teaching ability, and satisfaction and effectiveness.

Ethical Considerations - Ethical principles are crucial when studying Chinese computer teachers' information teaching ability, satisfaction and teaching effectiveness. The researcher needs to ensure that participants are fully informed and participate in the study voluntarily, respect their privacy, and safeguard the anonymity and confidentiality of the data. Weighing the scientific value of the study against the rights and interests of the participants, anonymous coding, explicit informed consent, and privacy protection measures were used to ensure the fairness and transparency of the study. At the same time, respect the wishes of the participants and ensure that they have the right to withdraw from the study at any time without any negative repercussions. The existence of conflicts of interest should be clarified and dealt with appropriately to ensure that the results of the study are not influenced by outside interests.

3. Results and discussion

Table 2

Summary Table on Informatization Teaching Ability

Indicators	Weighted Mean	Verbal Interpretation	Rank
Capability	3.13	Agree	1
Teaching and Learning	3.03	Agree	2
Design Capability	2.88	Agree	3
Composite Mean	3.01	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 2 presents the respondents Summary Table on Informatization Teaching Ability, with a combined mean of 3.01 indicating that the respondents were in general agree.

Capability, Weighted Mean: 3.13, ranked first; This score indicates that respondents performed the strongest in the area of integrative competencies among all the domains assessed. According to Zhang et al. (2020), integrative competencies may include skills across multiple domains, such as the use of information technology, the design and implementation of instructional strategies, and effective communication with students and colleagues. This high score indicates that respondents demonstrated a high level of competence and confidence in integrating and applying teaching skills.

Followed by Teaching and Learning, Immediately following general competence, this domain involves the respondents' ability to use information technology to support the teaching and learning process. This ranking reflects the ability of teachers to apply technology in their direct teaching and learning activities. Design Capability, This item relates to the respondents' competence in designing and implementing teaching environments and instructional activities. According to Liu et al. (2020) key aspects of design competence may include selecting appropriate technological tools, creating interactive and engaging learning activities, and adapting instructional strategies to accommodate different learning styles and needs.

Table 3

Summary Table on Teaching Satisfaction

Indicators	Weighted Mean	Verbal Interpretation	Rank
Capacity Utilization and Promotion	2.91	Agree	3
School Management	3.00	Agree	2
Wages and Benefits	3.12	Agree	1
Composite Mean	3.01	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 3 presents the Summary Table on Teaching Satisfaction, the weighted mean of the respondents is: 3.01 and the respondents agreed. The table shows that Wages and Benefits has a weighted average of: 3.12 and is ranked first. This score is the highest, indicating that teachers are most satisfied with the salary and benefits provided by the school. This is followed by School Management and Capacity Utilization and Promotion. These two items follow salary and benefits, suggesting that teachers are also relatively satisfied with the management of the school and how their competencies and promotion opportunities are utilized and recognized. Zhang et al. (2020) indicated that school management may be concerned with the administrative operations of the school, leadership styles, and transparency of the decision-making process, whereas competency utilization and promotion are concerned with whether or not teachers are able to make the best use of their professional skills and knowledge, and whether they have the opportunity to be promoted based on their performance and contribution. These rankings and scores reveal different aspects of teacher satisfaction, especially in the areas of financial rewards and career advancement.

Table 4

Summary Table on Teaching Effectiveness

Indicators	Weighted Mean	Verbal Interpretation	Rank
Teaching Effect	3.06	Agree	1.5
Teaching Methods and Interaction	3.06	Agree	1.5
Composite Mean	3.06	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 4 presents Summary Table on Teaching Effectiveness, the weighted mean is: 3.06 and the respondents agreed. Teaching Effect, with a weighted average of: 3.06, ranked first. This score indicates that teachers perceive their instructional effectiveness to be successful overall. Teaching effectiveness, as a composite indicator, reflects the direct impact of instructional activities on student learning outcomes, including student knowledge acquisition, skill development, and motivation to learn. Followed by, Teaching Methods and Interaction, Although this item did not have a specific score, it was ranked after teaching effectiveness, indicating that the respondents similarly believed that they performed well in terms of teaching methods and interactions with students. According to Liu et al. (2020), teaching methods and interactions include the teaching strategies used by the teachers, their classroom management skills, the way they communicate with the students, and how they motivate the students to actively participate in their learning. These factors are critical to creating an effective learning environment and have a direct impact on the realization of teaching effectiveness. These factors are crucial in creating effective learning environments that not only provide a platform for deeper learning and understanding, but are also effective in motivating students.

Table 5 shows the association between Informatization Teaching Ability and Teaching Satisfaction. The computed r-values indicates a moderate direct correlation and the resulted p-values were less than the alpha level. Results shows that there was significant relationship exists and implies that the better is the informatization teaching ability, the more that they are satisfied in teaching. This study explored the relationship between information technology teaching ability and teaching satisfaction through statistical analysis. The r value in the results is a correlation coefficient that measures the strength and direction of the linear relationship between two variables. In this study, the moderate r-value derived indicated a positive and direct association between informationalized teaching competence and teaching satisfaction.

Table 5

Relationship Between Informatization Teaching Ability and Teaching Satisfaction

Capability	r-value	p-value	Interpretation
Capacity Utilization and Promotion	.324**	0.000	Highly Significant
School Management	.535**	0.000	Highly Significant
Wages and Benefits	.421**	0.000	Highly Significant
Teaching and Learning			
Capacity Utilization and Promotion	.277**	0.000	Highly Significant
School Management	.591**	0.000	Highly Significant
Wages and Benefits	.375**	0.000	Highly Significant
Design Capability			
Capacity Utilization and Promotion	.254**	0.000	Highly Significant
School Management	.422**	0.000	Highly Significant
Wages and Benefits	.337**	0.000	Highly Significant

Legend: Significant at p-value < 0.01

In addition, the p-value was used to determine the statistical significance of this association. Since the p-value is less than the preset alpha level (usually 0.05). This indeed shows that the improvement of informatization teaching ability has a direct and significant impact on enhancing teachers' teaching satisfaction. With the continuous development and application of information technology, strengthening the building of informatized teaching ability has become a key way to improve teaching quality and teachers' job satisfaction. Through training and practice, teachers will be able to master and utilize informatized teaching methods to make teaching more vivid and efficient, thus enhancing students' participation and learning effects, and in turn increasing teachers' job satisfaction and sense of achievement.

Table 6

Relationship Between Informatization Teaching Ability and Teaching Effectiveness

Capability	r-value	p-value	Interpretation
Teaching Effect	.408**	0.000	Highly Significant
Teaching Methods and Interaction	.479**	0.000	Highly Significant
Teaching and Learning			
Teaching Effect	.443**	0.000	Highly Significant
Teaching Methods and Interaction	.626**	0.000	Highly Significant
Design Capability			
Teaching Effect	.332**	0.000	Highly Significant
Teaching Methods and Interaction	.439**	0.000	Highly Significant

Legend: Significant at p-value < 0.01

Table 6 presents hows the association between Informatization Teaching Ability and teaching effectiveness. The computed r-values indicates a moderate direct correlation and the resulted p-values were less than the alpha level. Results shows that there was significant relationship exists and implies that the better is the informatization teaching ability, the better is the teaching effectiveness. The data analysis shown in the table explores the association between informational teaching ability and teaching effectiveness. The resulting r value is a correlation coefficient that reflects the strength of the relationship between these two variables. In this case, a moderate r-value indicates a positive direct correlation between Informatization teaching competence and effectiveness.

At the same time, the resulting p-value is less than the prescribed alpha level (usually set at 0.05), implying that the correlation is statistically significant and unlikely to be caused by chance. This suggests that improving teachers' informatization teaching skills can effectively enhance their teaching effectiveness, which has important implications and guidance for educational practice. It can not only help teachers deliver knowledge more efficiently, but also stimulate students' interest and initiative in learning through rich and diverse teaching resources and means. With the continuous progress of technology, informatization teaching has become an important force to promote the modernization of education. Therefore, for teachers, mastering and skillfully applying informatization teaching skills is the key to enhancing teaching effectiveness and achieving educational

goals. This understanding is an important inspiration and guidance for educational practice, suggesting that we should pay sustained attention to and strengthen the construction of teachers' informatization teaching ability, so as to provide a strong guarantee for the cultivation of talents in the new era.

Table 7 displays the association between Teaching satisfaction and teaching effectiveness. The computed r-values indicates a very strong direct correlation and the resulted p-values were less than the alpha level. Results shows that there was significant relationship exists and implies that the more satisfied in teaching, the more effective the teaching is. The results of the study indicate a strong direct correlation between teaching satisfaction and teaching effectiveness. This relationship was derived by calculating the correlation coefficient (r-value), where a high r-value indicates a strong positive association between the two variables. In addition, statistical significance is judged by the p-value, which in this study was less than the preset alpha level (usually 0.05), indicating that the observed correlation did not occur by chance.

Table 7

Relationship Between Teaching Satisfaction and Teaching Effectiveness

Capacity Utilization and Promotion	r-value	p-value	Interpretation
Teaching Effect	.876**	0.000	Highly Significant
Teaching Methods and Interaction	.890**	0.000	Highly Significant
School Management			
Teaching Effect	.887**	0.000	Highly Significant
Teaching Methods and Interaction	.898**	0.000	Highly Significant
Wages and Benefits			
Teaching Effect	.846**	0.000	Highly Significant
Teaching Methods and Interaction	.805**	0.000	Highly Significant

Legend: Significant at p-value < 0.01

This strong correlation implies that when teachers perceive higher levels of teaching satisfaction, it usually leads to better teaching outcomes. Zhang et al. (2020) argued that high levels of teaching satisfaction may reflect teachers' positive perceptions of their teaching environments, resources, support, and personal teaching practices, which combine to enhance the overall quality and effectiveness of teaching. Therefore, increasing teachers' teaching satisfaction can be seen as an important way to improve teaching effectiveness.

Therefore, improving teachers' teaching satisfaction is actually an important way to improve teaching effectiveness. Teachers' teaching satisfaction is closely related to their teaching quality and enthusiasm. This positive mindset not only helps teachers to better utilize their teaching skills, but also influences students' learning attitudes and learning outcomes, thus forming a virtuous teaching cycle. Therefore, schools and educational institutions should attach importance to teachers' teaching satisfaction and stimulate teachers' enthusiasm and creativity by optimizing the teaching environment and providing abundant teaching resources and support, thereby improving teaching effectiveness and students' learning outcomes.

Table 8

Development Program for Computer Teachers in Chinese Colleges and Universities

Key Result Area	Objectives	Strategies	Success Indicator	Persons Involved
Informatization Teaching Ability 1.1Design Capability	The objective is to improve the capacity of teachers to utilize modern technological tools to design curricula and instructional materials, to ensure that the content meets the needs of learners, and to enable the effective use of digital resources to facilitate student	Provide regular professional development workshops and online training focused on the latest educational technology and design principles. Build a community of teachers to facilitate the sharing of knowledge and experience, including regular case workshops and reflection sessions. Bring in expert consultants to conduct instructional design reviews and give specific feedback and advice.	90% of the computer teachers are able to skillfully design and implement information technology teaching programs, and make full use of a variety of information technology tools for curriculum design and resource integration. Teachers are able to effectively design highly interactive teaching activities to enhance students' participation and learning outcomes. Teachers have the ability to flexibly adjust and optimize their teaching design to suit different teaching	Teachers/ students

	learning.		objectives and student needs.	
1.2 Teaching and Learning	Enhance student achievement and overall learning experience. Enhance teachers' instructional skills, particularly in the areas of classroom interaction and student engagement. Promote evidence-based instructional practices to improve teaching and learning strategies based on scientific research.	Implementing instructional adjustments based on student feedback to ensure that the content and methods of instruction respond effectively to student needs and preferences. Adopt a blended learning model that combines face-to-face instruction and online learning activities to increase the flexibility and accessibility of instruction. Conduct professional development training for teachers, focusing on improving their assessment skills, differentiated instructional approaches, and technology integration. Promote classroom observation and peer review to create a supportive environment for teacher development.	90% of computer science teachers are able to use information technology tools efficiently in their teaching to ensure that their classes are informative and relevant. Teachers are able to utilize a variety of teaching methods to promote students' understanding and application. Teachers have the ability to provide timely feedback and assess students' learning effectiveness in order to continuously improve teaching strategies and methods.	Teachers/ students
2.3 Capacity Utilization and Promotion	Identify and utilize each member's strengths and potential. Create an environment that supports and encourages individual and team growth. Ensure that all members' abilities are fully utilized to meet the strategic goals of the organization.	Conduct skills and competency assessments to understand each individual's strengths and areas for improvement. Implement customized training and development programs that target employees with different competency levels and career goals. Promote cross-departmental collaboration programs to facilitate knowledge sharing and cross application of skills. Create incentives to recognize outstanding contributions while motivating teams and individuals.	90% of computer science faculty effectively utilize and promote technological capacities within their teaching and research activities. Faculty members demonstrate proficient use of advanced technologies to enhance academic outputs and promote interdisciplinary collaboration. They actively contribute to enhancing institutional technological capabilities through innovative projects and collaborations.	Teachers/ students
3.Teaching Effectiveness 3.1 Teaching Effect	Enhance students' academic performance and understanding. Enhance teachers' teaching methods to be more efficient and innovative. Optimize curriculum design to better meet students' learning needs and contexts.	Evidence-based teaching methods such as flipped classroom and project-based learning are used to enhance student engagement and depth of understanding. Conduct regular teacher training to provide training on the latest teaching techniques and technology tools. Conduct regular program reviews and student feedback collection to adjust and improve teaching content and methods. Peer review and teaching observation are introduced to facilitate learning and experience sharing among teachers.	90% of computer science faculty demonstrate high teaching effectiveness, as evidenced by student feedback, learning outcomes, and academic performance metrics. Faculty members consistently employ innovative teaching methods that foster critical thinking and problem-solving skills among students. They adapt their teaching approaches to accommodate diverse learning styles and effectively integrate cutting-edge technologies to enhance instructional quality.	Teachers/ students
3.2 Teaching Methods and Interaction	Innovative teaching methods to ensure that they are effective in enhancing student motivation and engagement. Enhance student-teacher and student-student interactions to promote deeper learning and understanding. Improve teachers' mastery and utilization of teaching methods and interaction techniques.	Teachers are trained to use interactive teaching techniques such as collaborative learning, discussion-based teaching and the use of technological tools to enhance interaction. Seminars and workshops are organized regularly and education experts are invited to share best practices and latest research findings. Encourage teachers to conduct classroom experiments to explore new teaching methods and collect student feedback to assess the effectiveness of these methods. Teaching observations and video recordings are utilized for peer review and self-reflection for continuous improvement of teaching techniques.	90% of computer science faculty utilize engaging and interactive teaching methods that facilitate active student participation and collaboration. Faculty members employ diverse instructional strategies, such as flipped classrooms, project-based learning, and peer collaboration, to enhance student engagement and learning outcomes. They effectively use technology to create interactive learning environments that promote student interaction and critical thinking skills development.	Teachers/ students

4. Conclusions and recommendations

This indicates that most of the respondents believe that competence and teaching and learning are the two most important aspects of IT in teaching competence. This view reflects that teachers need to have solid professional competence and effective teaching methods in the application of information technology in teaching and learning in order to ensure the effectiveness of students' learning and the quality of teaching. This indicates that most of the respondents believe that salary and benefits and school management have the most significant and important impact on teaching satisfaction. The quality of salary and benefits directly affects the quality of life and professional satisfaction of teachers, while the effectiveness of school management affects the level of harmony and support in the teaching and learning environment. This indicates that the majority of respondents believe that teaching effectiveness, teaching methods, and interaction have significant strengths and importance in education. Teaching effectiveness is a direct reflection of the influence teachers have on student learning outcomes during the teaching and learning process, while pedagogy and interaction emphasize how teachers promote student engagement and learning outcomes through innovative teaching strategies and interactive learning environments. Faculty with strong informational teaching competencies tend to increase peer and student satisfaction, which in turn improves overall teaching effectiveness and student achievement. Significant relationships exist between informatization teaching competence, satisfaction, and effectiveness. Proposed a program for the development of computer teachers in Chinese colleges and universities.

The Government may increase its financial support for educational technology, including capital investment for the purchase of advanced teaching equipment and software. At the same time, special training centers should be established to help teachers improve their IT teaching skills. Teachers may practice the information technology teaching skills they have learned in their daily teaching and regularly reflect on their teaching practices to find ways to improve them. Students may provide feedback to teachers about the effectiveness of informationalized teaching and help them improve their teaching methods. Create an online platform for teachers to share and access teaching and learning resources, including curriculum design, teaching videos and interactive software. This platform can also be used for exchanges and discussions among teachers to enhance the openness and interactivity of teaching. Prospective researchers are encouraged to conduct interdisciplinary studies to explore the relationship between informationalized teaching and student learning outcomes, and how to enhance teachers' teaching satisfaction and self-efficacy through informationalized means.

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