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Factors Affecting the Quality of Teaching Information Technology and Solutions for Improvement at An Giang University in the Context of Digital Transformation

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Abstract-- In the context of digital transformation becoming an inevitable trend in higher education, improving the quality of Information Technology (IT) teaching plays a crucial role in developing students' digital competencies and professional skills. The IT subject not only provides knowledge and skills in using information technology but also contributes to forming logical thinking, problem-solving abilities, and adaptability to modern working environments. However, the quality of IT teaching is influenced by various factors such as curriculum design, lecturers' qualifications, teaching methods, facilities, assessment activities, and students' self-learning abilities. This article analyzes the factors affecting the quality of IT teaching at An Giang University and proposes solutions to enhance training effectiveness in the current context of digital transformation..

Keywords-- teaching quality, Information Technology, digital transformation, digital competence, students, An Giang University.

I. INTRODUCTION

Digital transformation is strongly impacting all aspects of social life, especially higher education. The development of digital technologies, artificial intelligence, big data, and cloud computing has fundamentally changed learning, research, and working methods. In this context, higher education institutions are not only responsible for providing professional knowledge but also for equipping learners with digital competencies to adapt to rapid societal changes.

The Information Technology subject is a foundational course in university curricula, contributing to the development of students' IT skills for learning and professional practice. For students at An Giang University, this subject plays an important role in supporting specialized learning, developing logical thinking, and enhancing self-learning capacity.

In recent years, An Giang University has promoted the application of information technology in management and teaching, gradually building a digital education environment.

However, in practice, IT teaching still faces several limitations such as outdated curriculum content, teaching methods that do not fully promote student activeness, insufficient facilities for practical training, and limited self-learning capacity among students. These issues directly affect training quality and learning outcomes.

Therefore, studying the factors affecting the quality of IT teaching and proposing improvement solutions is necessary to meet the requirements of educational innovation and digital transformation. Digital transformation is strongly impacting all aspects of social life, especially higher education. The development of digital technologies, artificial intelligence, big data, and cloud computing has fundamentally changed learning, research, and working methods. In this context, higher education institutions are not only responsible for providing professional knowledge but also for equipping learners with digital competencies to adapt to rapid societal changes.

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II. FACTORS AFFECTING THE QUALITY OF INFORMATION TECHNOLOGY TEACHING

2.1. Curriculum and Training Content

The curriculum is considered the backbone of the entire teaching and learning process, as it defines the objectives, structure, content, learning outcomes, and assessment methods of an academic program. In the context of Information Technology education, the curriculum plays an even more critical role because the field is characterized by rapid technological changes and continuous innovation. Therefore, an effective IT curriculum must ensure three core requirements: up-to-date knowledge, practical applicability, and alignment with labor market demands.

Firstly, regarding up-to-date content, IT curricula must be regularly reviewed and revised to keep pace with technological advancements. Emerging fields such as digital transformation, artificial intelligence (AI), machine learning, big data analytics, cloud computing, cybersecurity, and Internet of Things (IoT) are no longer optional topics but essential components of modern IT education. If curricula fail to incorporate these areas in a timely manner, students may graduate with outdated knowledge that does not meet current industry expectations.

Secondly, in terms of practical relevance, IT education should move beyond theoretical knowledge toward competency-based and application-oriented learning. This requires a clear balance between theoretical foundations and hands-on practice. For instance, instead of focusing solely on conceptual understanding of programming or databases, students should be engaged in real-world projects, coding assignments, simulations, and case studies that reflect authentic industry problems. Practical exposure not only strengthens technical skills but also enhances problem-solving ability, creativity, and teamwork competence.

Thirdly, concerning alignment with labor market demands, curriculum design must be informed by continuous feedback from industry stakeholders, employers, and alumni. This ensures that learning outcomes are relevant to job requirements and professional standards. A curriculum that is disconnected from workplace realities risks producing graduates who lack employability skills or require significant retraining after graduation.

However, in practice, many current IT curricula still exhibit certain limitations. A notable issue is the persistence of theory-heavy content, where students spend a significant amount of time on lectures and conceptual explanations but have limited opportunities for experiential learning.

This imbalance reduces students' ability to transfer knowledge into practice and weakens their readiness for real working environments. Additionally, the lack of interdisciplinary integration and insufficient exposure to real-world projects further limits students' adaptability in dynamic technological contexts.

Therefore, continuous curriculum innovation is not merely a technical adjustment but a strategic requirement for ensuring the quality and relevance of IT education in the era of digital transformation.

2.2. Lecturers

Lecturers represent the most influential human factor in determining the quality of teaching and learning outcomes in higher education. In Information Technology education, their role becomes even more significant due to the fast-evolving nature of the discipline and the increasing integration of digital tools in pedagogy. An effective IT lecturer is not only a subject matter expert but also a facilitator of learning, instructional designer, and digital practitioner.

First, professional competence remains the foundational requirement. Lecturers must possess solid academic knowledge in core IT domains such as programming, systems design, databases, networking, and emerging technologies. However, subject expertise alone is no longer sufficient in the context of modern higher education.

Second, lecturers must develop digital pedagogical competence, which includes the ability to effectively integrate technology into teaching and learning processes. This involves designing digital learning materials, using learning management systems (LMS), creating multimedia content, and applying educational technologies such as simulation tools, online coding platforms, and virtual labs. These competencies enable lecturers to create interactive and engaging learning environments that enhance student participation and understanding.

Third, lecturers are expected to implement active learning methodologies that shift the focus from teacher-centered instruction to learner-centered engagement. Approaches such as project-based learning, problem-based learning, flipped classrooms, and collaborative learning require lecturers to act as facilitators who guide students in exploring, analyzing, and solving real-world problems rather than simply transmitting knowledge.

In addition, in the context of digital transformation, continuous professional development is essential. Technology in the IT field evolves rapidly, and without ongoing training and upskilling, lecturers may struggle to keep pace with new tools, frameworks, and pedagogical approaches.



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Regular participation in workshops, certifications, research activities, and industry collaborations is therefore necessary to maintain teaching effectiveness and relevance.

Another important aspect is the ability to connect academia with industry practice. Lecturers should actively engage with technological trends in the labor market, collaborate with enterprises, and incorporate real-world case studies into teaching. This connection helps bridge the gap between theoretical knowledge and practical application, thereby improving graduate employability.

However, challenges remain. Some lecturers may face difficulties in adapting to new technologies or transitioning from traditional teaching methods to digital and interactive pedagogies. Limited time for professional development and lack of institutional support may also hinder innovation in teaching practices.

In conclusion, strengthening lecturers' capacity in both technical expertise and digital pedagogy is a decisive factor in improving the quality of IT education. Without a highly competent and continuously developing teaching staff, curriculum reform and infrastructure investment alone will not be sufficient to ensure meaningful educational transformation.

2.3. Teaching Methods

Teaching methods play a decisive role in shaping the effectiveness of the teaching–learning process, as they determine how knowledge is transmitted, constructed, and applied by students. In Information Technology education, where practical skills and problem-solving abilities are essential, the choice and implementation of teaching methods have a direct impact on students' learning outcomes, engagement, and professional readiness.

Traditional lecture-based instruction, while still valuable for introducing theoretical concepts and providing structured knowledge, has inherent limitations when used as the dominant teaching approach. Excessive reliance on one-way knowledge transmission may lead to passive learning behaviors, reduced student engagement, and limited opportunities for critical thinking and creativity development. In such environments, students often become receivers of information rather than active participants in the learning process.

In response to these limitations, modern educational approaches emphasize active learning pedagogies, which place students at the center of the learning process. Approaches such as project-based learning (PBL), problem-based learning, flipped classroom models, and blended learning environments have been widely recognized as effective strategies in IT education.

These methods encourage students to actively explore knowledge, collaborate with peers, and apply theoretical concepts to real-world problems.

For example, project-based learning allows students to work on authentic tasks such as developing software applications, designing databases, or building small-scale information systems. Problem-based learning challenges students to analyze and solve complex scenarios that reflect real industry situations. Flipped classrooms shift the initial knowledge acquisition to independent study, while classroom time is dedicated to discussion, practice, and problem-solving activities. Blended learning integrates face-to-face instruction with online learning platforms, providing flexibility and continuous access to learning resources.

Collectively, these pedagogical approaches foster essential 21st-century skills such as critical thinking, collaboration, communication, creativity, and digital literacy. Therefore, the continuous innovation of teaching methods is a fundamental requirement for improving the quality of IT education in the context of digital transformation.

2.4. Facilities and Technological Infrastructure

Facilities and technological infrastructure constitute a critical enabling condition for effective teaching and learning in Information Technology education. Unlike many other disciplines, IT education requires not only theoretical instruction but also continuous hands-on practice using hardware, software, and digital platforms. Therefore, the availability and quality of infrastructure directly influence the effectiveness of instructional delivery.

Key components of IT learning infrastructure include computer laboratories, network systems, servers, licensed software, development tools, and stable internet connectivity. These resources provide students with opportunities to practice programming, system design, data analysis, and other technical competencies in an environment that simulates real-world working conditions.

In addition, the development of digital learning ecosystems, such as Learning Management Systems (LMS), virtual classrooms, and cloud-based learning platforms, has become increasingly important. These systems enable flexible learning, facilitate resource sharing, and support continuous interaction between lecturers and students beyond traditional classroom boundaries.

Although An Giang University has made significant efforts to invest in infrastructure development, the rapidly evolving nature of digital transformation continues to place increasing demands on educational facilities.



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Many software tools and technologies used in the IT industry are updated frequently, requiring corresponding updates in teaching resources and laboratory configurations. Moreover, the growing demand for online and hybrid learning models highlights the need for robust and scalable digital platforms.

Therefore, continuous investment and strategic upgrading of technological infrastructure are essential to ensure that teaching and learning activities remain relevant, effective, and aligned with current technological standards.

2.5. Assessment Activities

Assessment is a fundamental component of the teaching and learning process, serving both as a measurement tool for learning outcomes and as a mechanism for improving instructional quality. In Information Technology education, assessment practices must go beyond the evaluation of theoretical knowledge and emphasize the demonstration of practical skills, problem-solving abilities, and applied competencies.

Traditional assessment methods, which often rely heavily on written examinations and memorization of concepts, may not adequately capture students' actual abilities in IT-related fields. Such approaches tend to prioritize recall of information rather than the application of knowledge in real-world contexts.

To address this limitation, there is a growing shift toward competency-based assessment, which focuses on evaluating what students can do with their knowledge rather than what they remember. In IT education, this includes assessing students through practical tasks such as coding assignments, system design projects, data analysis reports, and software development exercises.

In addition, modern assessment strategies increasingly incorporate project-based evaluation, where students are required to complete comprehensive tasks that simulate real industry projects. Digital products, such as applications, websites, or databases, serve as tangible evidence of learning outcomes.

Another important innovation is the use of e-portfolios, which allow students to systematically collect and showcase their academic work over time. E-portfolios not only reflect learning progress but also encourage self-reflection and continuous improvement. Furthermore, peer assessment and self-assessment techniques contribute to the development of critical thinking and evaluative skills.

Overall, the transformation of assessment practices toward competency-based and authentic evaluation models is essential for ensuring that learning outcomes accurately reflect students' readiness for professional practice in the digital economy.

2.6. Students' Competence and Learning Motivation

Students are the central actors in the teaching and learning process, and their competence, motivation, and learning behaviors significantly influence educational outcomes. In the context of digital transformation, students are expected to take greater responsibility for their own learning, actively engage with digital resources, and continuously update their knowledge and skills.

Student competence in IT education includes not only foundational computer literacy but also higher-order digital skills such as information processing, online collaboration, problem-solving, and the ability to use specialized software tools. Equally important is the development of self-directed learning skills, which enable students to independently access, evaluate, and apply knowledge from diverse digital sources.

Learning motivation plays a critical role in determining the level of student engagement and persistence in academic activities. Students with strong intrinsic motivation are more likely to actively participate in learning tasks, explore additional resources, and persist in solving complex problems. Conversely, low motivation may result in passive learning behaviors and reduced academic performance.

However, in practice, there are still significant variations in students' entry-level competencies. Some students enter university with limited exposure to advanced digital tools, while others may lack essential self-learning strategies. Additionally, disparities in prior educational backgrounds can lead to uneven learning progress within the same classroom.

Another challenge lies in students' dependency on instructor guidance, which may limit their ability to develop independent learning habits. In a rapidly changing technological environment, this dependency can hinder their adaptability and long-term professional development.

Therefore, enhancing students' competence and fostering strong learning motivation require coordinated efforts from both educators and institutions, including the design of supportive learning environments, the integration of engaging teaching strategies, and the provision of resources that encourage autonomy and lifelong learning.

III. SOLUTIONS TO IMPROVE TEACHING QUALITY IN INFORMATION TECHNOLOGY

To improve the quality of IT teaching in the context of digital transformation, the following solutions should be implemented synchronously:



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First, innovate the curriculum towards competency-based education and regularly update it with emerging technologies. Course content should align with societal needs and students' future careers.

Second, enhance lecturers' professional and digital competencies through training programs, workshops, and scientific research activities.

Third, innovate teaching methods toward learner-centered approaches, increasing practical activities, experiential learning, and project-based learning.

Fourth, invest in upgrading facilities, computer labs, specialized software, and online learning systems to support teaching and learning activities.

Fifth, reform assessment methods toward competency-based evaluation, emphasizing the application of knowledge in practice.

Sixth, develop students' self-learning and digital competencies through guidance on digital learning resources, online courses, and academic activities.

Seventh, strengthen cooperation with enterprises to update practical requirements, provide internship opportunities, and enhance students' professional experience.

IV. CONCLUSION

The quality of Information Technology teaching at An Giang University is influenced by multiple factors, including curriculum design, lecturers, teaching methods, facilities, assessment activities, and students' learning abilities.

In the context of digital transformation, improving IT teaching quality is essential for developing students' digital competencies and meeting the demands of the modern labor market.

To achieve this goal, the university should implement synchronous solutions related to curriculum innovation, lecturer development, infrastructure modernization, teaching and assessment reform, and enhancement of students' self-learning capacity. These efforts will contribute to improving training quality and promoting sustainable development in higher education during the digital transformation era.

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