



Research on the Construction of Technical Ethics Boundary and Responsibility Model in the Construction of Smart Campus

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Abstract. With the rapid development of information technology, the construction of smart campuses has gradually become an important direction in the field of education. However, in this process, ethical issues related to technology are becoming increasingly prominent^[1]. This article aims to explore the boundaries of technological ethics in the construction of smart campuses, and construct a responsibility model, especially by combining quantifiable data anonymization technology, encryption technology, and the combination of hierarchical management and anonymity technology for privacy protection strategies, in order to ensure that the rights of teachers and students are not violated while ensuring technological development.

Keywords: Smart Campus Construction, Technological Ethics, Privacy Protection Strategies, Responsibility Model, Quantifiable Techniques

1 Introduction

The construction of smart campuses not only promotes the intelligence and efficiency of teaching, management, and services, but also faces ethical challenges such as data privacy leakage and technology abuse. To ensure the healthy development of technology and protect the rights and interests of teachers and students, it is an urgent task to clarify the ethical boundaries of technology and build a responsibility model. This is not only a standardized application of information technology, but also a deepening and expansion of campus connotation construction.

2 The Ethical Boundaries of Technology in the Construction of Smart Campuses

2.1 Data Privacy Protection

In the construction of smart campuses, data privacy protection is not only related to the respect of personal privacy rights, but also directly related to the stable development of

campus information construction^[2]. In the era of big data, personal information, academic performance, daily behavior, and other data of teachers and students have become valuable resources. Once these data are leaked or abused, they will bring incalculable losses to individuals and schools. Therefore, it is particularly important to establish strict standards for data collection, storage, use, and sharing. This requires us to develop detailed data protection policies, clarify the scope of data collection, purpose of use, and sharing methods, and ensure that every step complies with legal and regulatory requirements. At the same time, strengthening the training and supervision of data management personnel, enhancing their data security awareness and operational skills, is also the key to preventing data leakage and abuse incidents. In addition, establishing a sound data leakage emergency mechanism can quickly respond to data leakage incidents, take effective measures, and minimize losses.

2.2 Legitimacy of Technology Use

The legitimacy of technology use is an indispensable aspect in the construction of smart campuses. In the process of promoting the construction of smart campuses, we must always adhere to the principle of combining technology application with the actual needs of education and teaching. This requires us to fully consider whether the selection and use of technology conforms to the laws of education and teaching, and whether it can truly improve teaching quality and efficiency. At the same time, we should also be vigilant against the abuse and misuse of technology, to avoid it becoming a tool for pursuing surface effects or satisfying personal interests. For example, in the teaching process, we should make reasonable use of multimedia, online teaching platforms and other technological means^[3], but at the same time, we should also pay attention to actual interaction and communication between teachers and students, and avoid overly relying on technology and ignoring the essence of teaching. In addition, we need to strengthen the supervision and regulation of technology usage behavior to ensure the legality and legitimacy of technology application.

2.3 Technical Fairness

Technical fairness is an aspect that cannot be ignored in the ethical boundaries of technology in the construction of smart campuses. In a smart campus, technological resources and services should fairly benefit all teachers and students, and educational inequality should not be caused by factors such as the level of technical mastery or economic conditions of certain teachers and students. In order to achieve technological fairness, schools should strengthen the rational allocation and supervision of technological resources, ensuring that every teacher and student can have equal access to the necessary technical support and services. At the same time, attention should also be paid to the needs of special groups, such as disabled students and economically disadvantaged students, and personalized technical support and solutions should be provided to ensure that they can fully enjoy the convenience and benefits brought by smart campuses. The associated logical architecture is shown in Figure 1

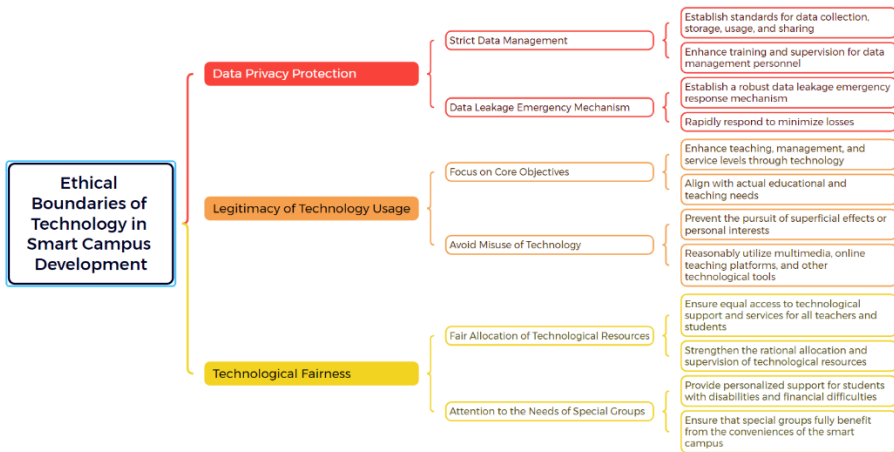


Fig. 1. Ethical Boundaries of Technology in Smart Campus Development

3 The Main Ways of Transformation in Technological Ethics

3.1 Clarify the Responsible Party

It is crucial to clarify the responsible parties when constructing a model of technological ethical responsibility. The school management should be responsible for formulating and implementing the overall plan for the construction of a smart campus, ensuring the compliance and ethics of technology applications^[4]; Technology providers are responsible for providing secure and reliable technical support and services, ensuring the security and privacy of data for teachers and students; As direct participants in teaching work, teachers should use technology reasonably to ensure the quality and effectiveness of teaching activities; And students should also actively protect their own rights, abide by technical usage norms, and not participate in any violations.

3.2 Develop Ethical Standards

Developing ethical norms is the core link of the technology ethics responsibility model. These regulations should elaborate on the code of conduct in data privacy protection, technology use, and other aspects, providing clear guidance for all parties. By establishing ethical standards, it is possible to ensure that all parties involved in the construction of smart campuses adhere to ethical principles and avoid the occurrence of violations. At the same time, these norms also contribute to improving the technical and ethical awareness of teachers and students, and promoting the construction of campus civilization.

3.3 Establish a Accountability Mechanism

To ensure the effective implementation of the technology ethics responsibility model, it is essential to establish a accountability mechanism. For behaviors that violate ethical norms, a clear accountability process should be established to ensure that violations can be promptly addressed and corrected. Through the accountability mechanism, an effective deterrent force can be formed to prevent potential violations from occurring. At the same time, for serious violations, relevant responsible persons should also be held legally responsible to maintain the seriousness and authority of technical ethics.

4 The Application of Privacy Protection Technology in Responsibility Models

Data anonymization technology: k-anonymity models and other technologies protect privacy by ensuring the indistinguishability of individual information, effectively preventing re identification attacks^[5]. In the construction of smart campuses, such technologies can be used to process data and ensure the security of personal information for teachers and students.

Encryption technology: including ciphertext computation, ciphertext access control, and ciphertext data aggregation, it can protect the security of data throughout the entire data lifecycle. In a smart campus, sensitive data should be encrypted to prevent data leakage and abuse.

The combination of hierarchical management and anonymous technology: By combining anonymous technology with hierarchical management technology, it is possible to effectively utilize data while protecting user privacy. In a smart campus, hierarchical management can be carried out based on the sensitivity and importance of data, and different anonymization measures can be taken for data at different levels. The associated logical architecture is shown in Figure 2

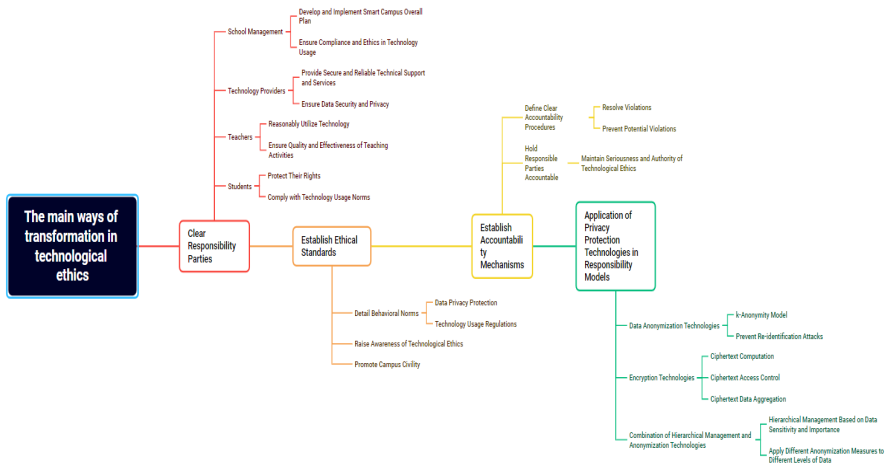


Fig. 2. The main ways of transformation in technological ethics

5 Conclusion

The construction of technological ethical boundaries and responsibility models in the construction of smart campuses is not only a necessary requirement for technological development, but also an important measure to protect the rights and interests of teachers and students and maintain campus stability and harmony. By clarifying the ethical boundaries of technology, we can effectively prevent technology abuse and misuse, and ensure that the construction of smart campuses complies with social ethics and moral norms. At the same time, building a responsibility model helps to clarify the responsibilities and rights of all parties in the construction of smart campuses, promote the rational application and healthy development of technology^[6]. In addition, the application of privacy protection technology and algorithms can promote the efficient operation of smart campuses while ensuring information security and personal privacy. In summary, the construction of technological ethical boundaries and responsibility models in the construction of smart campuses is of great significance for promoting the healthy development of smart campuses.

6 Expectation

Looking ahead to the future, the construction of smart campuses will continue to deepen, and the ethical boundaries and responsibility models of technology will also face new challenges and opportunities. With the continuous emergence of new technologies and the expansion of application scenarios, we need to closely monitor the

development and application trends of new technologies, and timely adjust and improve the ethical boundaries and responsibility models of technologies^[7]. At the same time, we will strengthen technological research and innovation, promote the continuous upgrading and improvement of privacy protection technologies and algorithms, and provide strong support for the sustainable development of smart campuses. In addition, strengthening international cooperation and exchanges, and jointly promoting the international standardization and standardization of smart campus construction, are also important directions for future development. In short, the technological ethical boundaries and responsibility models in the construction of smart campuses will continuously adapt to the needs of the times, and contribute to the construction of a more intelligent, efficient, and safe campus environment.

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