Modern Management Science & Engineering
ISSN 2052-2576
Vol. 6, No. 3, 2024
www.scholink.org/ojs/index.php/mmse

2024 International Conference on Science and Technology, Modern Education and Management (TMEM 2024)

Infringement Risk and Assessment Indicator Construction for Smart Classroom Application Scenarios

Yenan Li[1]

[1] Southeast University, Jiangsu, Nanjing, China

Abstract

The rapid development of artificial intelligence, modeling analysis and other technologies in the data era has ushered in the third revolution in education, and the "smart classroom" has emerged; however, the smart classroom, which is still in the early stage of practice, has shown a certain degree of immaturity in the provision of functionality, and the application scenarios hide a number of risks of infringement. Among them, the rights and interests of personal information, students' right to learn and teachers' right to education and teaching are at risk of being infringed. This paper focuses on the two dimensions of the nature of the right and the quantification of the standard, based on the analysis of the infringement risk of the use of smart classroom, the use of AHP hierarchical analysis method to build a systematic assessment index for the infringement risk in the application scenario of smart classroom, and present the investigation content in the form of indexing, so that it can provide a reference for the field of evaluation of the construction of China's smart classroom.

Keywords

Smart classroom, Legal risk, Rights violations, Assessment indicators

1. Introduction

"Smart classroom" refers to the provision of space carrier and hardware equipment for smart education, which is the physical product of the introduction of education informatization into the campus. "Smart classroom" and "electronic classroom" "artificial intelligence classroom" in the application of technology and the appearance of the performance of a high degree of similarity, but in the theoretical implications and the risk of splitting, compared with the latter However, in terms of theoretical implication and risk separation, it is more comprehensive and representative than the latter in terms of scope and breadth and depth. The smart classroom incorporates computer network teaching system, virtual reality tools, voice recognition, image capture and other multiple technologies into practical application, and creates an Internet of Things, cloud computing, wireless communication and other new ways to build an Internet of Things, intelligent, perceptual, ubiquitous teacher-student interaction

system in the teaching mode and classroom dimension, and configures the means of tools for the transformation and upgrading of the education and teaching mode in the technological era.

However, the smart classroom, which is still in the early stage of application, shows a certain immaturity in the provision of functions. The underlying technologies, such as information collection, portrait monitoring, intelligent instruction, and online assessment, all carry the risk of violating the rights and interests of private subjects and threatening the loss of social security. On the one hand, the smart classroom innovates the implementation of basic education with convenience and efficiency, but on the other hand, it forces the subjects involved to give up their personal space. The application of the new classroom in schools at all levels in China is in the pilot and experimental stage, and lacks authoritative official standards. The lack of public endorsement in the access mechanism and performance control directly exacerbates the lag and negligence in the introduction process, and leads to infringement and risk concerns in the application of smart classrooms in China. The Ministry of Education "on the new situation to do a better job of general primary and secondary school equipment opinions" clearly: "the establishment of equipment, new technologies, new products into the school of scientific experimentation and demonstration mechanism, after the hazard test and teaching adaptability evaluation of the technology and products before entering the school."

The smart classroom has gone through a stage of development from focusing only on scientific and technological forms to shifting to judicial assessment and risk prevention and control. Social risks and legal boundaries have been gradually awakened from their contradictory "hibernation", and the public's awareness of their rights has been gradually awakened through the promotion and use of technology. In other words, while the "smart classroom" model has brought about innovative progress and significant social benefits in the field of education, it has also made it easier to upset the balance between technological benefits and the rights of citizens due to the lack of review standards and the neglect of risk infringement.

2. Legal Risks

The implementation of smart classrooms has brought convenience to teachers and diversity to students, and the steady progress of real-life pilots has highlighted the broad prospects of smart teaching on the one hand, and the potential risks of infringement of rights on the other hand, inducing users' concerns and doubts. The problems in the application scenarios intuitively reflect the possibility of damage and the need to consider the protection of personal information and basic human rights in the application scenarios of smart classrooms. Therefore, the research team takes typical pilots around the world as the entry point, uses sensory opinions as the argumentative material, and changes the analysis of rights into the evidence to horizontally examine the infringement risks of smart classrooms.

2.1 Personal Information Protection: Examination of the Rights and Interests of Personal Information

In scenarios where smart classrooms collect and process personal information, there is often a risk of abusing the power of data. The Personal Information Protection Law clearly states the legislative purpose of "protecting the rights and interests of personal information", incorporates the rights to know, decide, inquire, correct, copy, carry and delete into the collection of rights, and imposes legal obligations on the processor, such as informing, obtaining consent, security protection, reporting and supervision. In practice, the complex and delicate processes of smart classrooms involve the collection, preservation and use of user information data, such as user registration, teacher and student attendance, learning analysis, personalized and customized teaching, and live lectures. Due to the highly specialized nature of the process, it is often difficult for users to detect the excessive collection, excessive mining, leakage and illegal circulation and utilization of personal information by organizations.

Even if the platform organization clearly lists the terms of "informed consent" of the user in the privacy service agreement, or if there is no subjective intent to intentionally abuse its power, it is still prone to substantive infringement of the rights and interests of the user's personal information. For example, the Terms of Use and Privacy Policy of the Hengshui City Intelligent Education Cloud Platform uses the phrase "the user fully understands and agrees" on several occasions, but it is difficult to measure whether the fulfillment of a company's obligation to notify the user of its privacy protections is sufficiently informative to the individual in practice. As information processors have information advantages over individuals in terms of technology, knowledge, and resources, users lack the ability to understand the highly complex and specialized privacy policy provisions in detail, and their right to know is effectively nullified. In addition, Article 1035 of the Civil Code stipulates the "informed consent" rule for the collection and processing of personal information in a rather general and loose manner, including implied consent, leaving a legal loophole for the protection of the right to information. In the scenario introduced by school education, teachers and students are in a weaker position than the school level, and often passively accept the unified teaching management, which is presumed to be implied acceptance. Overseas countries are more cautious about this, for example, Cornell University, Georgia Institute of Technology in the introduction of smart classrooms in the process of taking a one-by-one inquiry, to ensure that each user "informed - consent".

Further, smart classrooms may also involve privacy infringement with respect to sensitive information about personal data. China's legislation distinguishes electronic information into personal information (electronic information that can identify individual citizens) and privacy (electronic information involving the privacy of individual citizens), which overlap in the "sensitive" part. The Personal Information Protection Law stipulates that the handling of sensitive information must be strictly for a specific purpose and sufficiently necessary, and that strict protection measures must be taken. In terms of "knowledge and consent", the individual's separate consent should be obtained, and Article 1033 of the Civil Code also adopts the expression "the express consent of the right holder" for the handling of

private information, which does not include implied circumstances.

In practice, the collection of education data often includes sensitive data in its scope. For example, in October 2021, an elementary school in Xinzhou, Shanxi Province, launched a statistical table of students' situation, which provides statistics on students' family situation according to 11 categories, including "children of leaders" and "children of business bosses", etc. In addition, in the application of face attendance, it is to a certain extent a personal choice of students when to enter the classroom. In addition, in the application of face attendance, when students enter the classroom is to a certain extent the students' personal choice, which is difficult to distinguish from general personal information. In the protection of personal information of minors, the Personal Information Protection Law sets a higher threshold for the handling of personal information of minors under the age of 14, which is more likely to give rise to ethical issues.

In addition to students, the infringement of personal information by smart education may also cause teachers to worry about their own information rights and interests. A teacher at Southeast University expressed his concern that the video of the entire lecture captured by the camera would be uploaded to the Internet, and that his personal life and work information cited for teaching would be leaked.

2.2 Protection of Fundamental Human Rights: An Examination of Identity Rights

In addition to the protection of personal information, students and teachers, as direct participants in the teaching and learning process and as in-depth users of the smart classroom system, are also at risk of infringement of their own identity rights related to the teaching and learning process. In this dimension, teachers and students, in their specific roles in the pedagogical field, are endowed with specific rights in the sense of basic human rights, which are materialized in the students' right to learn and the teachers' right to educate and teach.

2.2.1 Students' Right to Learn

As a long-term cooperation unit of smart classroom application, Fengli Primary School in Nantong City, Jiangsu Province, introduced the "Intelligent Online Education Platform" in August 2021, which was firstly tried out in the fifth and sixth grades to carry out the pilot project of "Human-Computer Interactive Teaching" in a small scale. The platform connects the front-end of teachers, the end-end of students and teaching resource terminals through Internet technology, and establishes an integrated resource pool through a net-like structure, which directly intervenes in the field of students' self-directed learning in addition to teachers' teaching and provides instant self-service question and answer sessions, online coursework correction and customized learning plans. After students' answer data are uploaded to the platform, they are captured, extracted, uploaded and summarized into an analysis step, which provides real-time feedback of learning profiles to students based on individualized differences. The birth of this intelligent platform is aimed at determining the type of service provision by means of individualized evaluation, i.e., highlighting the relevance and uniqueness of the target audience in terms of teaching content and knowledge provision, and reaching the connection between theoretical needs and actual teaching as much as possible.

But in fact, the introduction of this platform in schools can provide relatively convenient channels for answering questions, but the relaxation is only the time limit for obtaining the required information, the limited capacity and the scope of the content can not be shortened by the shortening of the time-consuming to make up; even if the explanation of patience and meticulous, straightforward corrective lectures in fact compressed the students on the corrective correction of errors in the choice of space, excessive input will only result in the creation of a dependence on the increase in the possibility of the loss of the ability of independent thinking easier. Excessive input will only increase the possibility of dependence and make the loss of independent thinking easier. Undoubtedly, the platform has greatly compensated for the defect of not being able to contact teachers and students at any time, and has given ordinary students a quick path and a fair chance to obtain explanations during the learning process, but with the advancement of the coursework and the overlapping of the depth of use, the defects of matching the system's knowledge storage equipment with the actual demands are gradually exposed. In other words, the theoretical resources framed within the system can hardly fully satisfy the real needs of students, and at this stage of the pilot program, students have already experienced discomfort and hesitation in their subjective experience.

In terms of using the smart online education platform, Chen, the class president of Grade 5 Class 3, experienced a subtle shift in attitude. For Chen, the initial experience has remained at an ideal level, "In the process of learning, it is inevitable that I will encounter situations where the teacher is not around but I really have questions. This system can help me understand the points in time when I encounter such situations." However, as the operation process widens horizontally, Chen gradually realized the drawbacks of limited answers and acceptance restrictions, "The knowledge reserve of the system is not comprehensive, and a lot of knowledge will not be included; at the same time, there will also be too many lectures, and I'm afraid that I will overly rely on this system and lose the ability to think on my own in the future." Concerns about the platform's interference with thinking and limited functionality prompted him to return to the original teacher Q&A model, avoiding as much as possible the impact of smart classroom technology on the evolution of the curriculum.

Essentially, the over-involvement of online platforms violates students' right to learn. The right to learn and the right to education overlap in terms of the meaning of the right and the system to which it belongs, with the former being the superordinate concept of the latter, and the latter being the directional category of the former. The transformation and upgrading of society has brought about a rethinking and revolutionizing of the traditional education model, and the "right to education" in the conventional sense cannot be applied to the requirements of the "learning society", nor can it respond to and explain the many problems that exist in reality. Therefore, the right to learning must be considered at the level of fundamental rights, defined as "the right to read and write, the right to ask and think questions, the right to imagine and create, the right to know the human world and to write history, the right to access educational resources, and the right to develop individual and collective skills."

The right to learn, which includes the right to learning opportunities, the right to conditions for learning

and the right to success in learning, is reflected in the facts contained in the documents of the UNESCO Declaration, which confirms its nature of belonging to the field of fundamental human rights, and can be analyzed in the framework of the "social right - right to liberty". The promotion and facilitation of the realization of the right to learn is a manifestation of the facilitation of students' activities, and the guarantee and establishment of the right point to governmental actions and State obligations at the social level, highlighting the strong characteristics of social rights; however, external material support and policy guarantees can only prove that the realization of the right requires a foundation of conditions, but cannot change the fundamental attributes of the right as a right to liberty. The right to learn is still essentially a right to freedom, and belongs to the first generation of human rights, laying the foundation for other rights, such as the right to education, the right to cultural participation, and the right to freedom of expression. At the core of the right to learn lies the freedom of individual learning activities, to engage in learning voluntarily and autonomously, free from external constraints and interventions. In the positive dimension, it includes freedom of action and freedom of choice, including access to education and fair competition, the latter of which even carries an element of substantive equality; in the negative dimension, it is meant to curb the boundaries of the freedom of the rest of the private subjects, to prevent the collision of private interests and infringement by other subjects, and to confer on the individual an absolute obligation not to be interfered with in the world.

The right to learn has more right attributes and free space than the right to education, emphasizing the freedom to "learn" that natural persons enjoy throughout their lives. As a bundle of rights, the right to study, the right to choose whether or not to obtain study materials and the right to receive question-and-answer services are both tangible expressions of the freedom under the right to study, and the over-expansion of the smart classroom system is a substantial infringement of students' freedom to study.

2.2.2 Right to Education and Teaching

"The Intelligent Lesson Plan Generation System (ILPGS), as a simplified and supportive tool for the course filing process, was introduced to Shaoxing No.1 High School in Zhejiang Province in December 2021, and is being initially piloted for the first year of senior high school students. The system stores teachers' lecture materials in labeled format and builds a typed template pairing mechanism. Teachers input the characteristics of the curriculum and the attributes of specific chapters on the operation side, provide the purpose of the lesson, the direction of the lesson and the object of the lesson, and then automatically generate usable classroom lesson plans and written materials by extracting the common directions with the support of the massive data through the rapid conversion of the data and coding correspondences. Teachers are transformed from the original preparer of lectures to the selector and reviewer of materials. The preliminary stage of teaching preparation is limited to the connection between oral explanation and lesson plan assistance, and the preparation is simplified to the selection, export and modification of preparation, so that the subjective level of creativity is weakened, and teachers do not need to invest too much time and energy, and only need to focus on the process of

modification and rehearsal of the narration process.

The system was introduced by the university to save teachers' time spent on course lesson plan preparation, to free teaching staff from relatively repetitive labor, and to optimize the process of creation from nothing into a process of improvement from something to something. However, the design of restructuring time use and reducing teaching pressure is only realizable at the theoretical level. Although classroom teaching and actual lectures are essentially categorizable, with the contents and key points of the general syllabus delineated in the subject catalog, face-to-face contact and oral language transmission naturally have human emotional attributes, and a uniform formulaic presentation will only exacerbate the lack of sensual factors, limiting the teacher's ability to efficiently play a role in the process of teaching and learning as well as the individual's motivation. Mechanized language and automatic generation mechanism on the one hand limit teachers' free space and room for play, and on the other hand promote teachers' inertia and dependence. The leader of the teaching process has been weakened into an auxiliary of intelligent materials, and the appearance of the teaching level tends to be the same, and it is difficult to judge the actual professional ability; the homogenization of the products under the market economy is easily oriented to the collapse of the value of the "good money to drive out the bad money". Once the existing evaluation mechanism and assessment methods are hollowed out, teachers will gradually lose their enthusiasm for improving their professionalism, and the model of tailored teaching and diversified development will be reduced to empty talk, directly restricting the exercise of pedagogical freedom and indirectly affecting the quality of education available to students.

Ms. Yu Xuemei, the teaching leader of the English subject in Jiangsu Province, did not hesitate to put forward her inner thoughts, "This system is indeed very useful in helping us to prepare and teach lessons. But to a certain extent, it deprives teachers of the right to freely decide what to teach." The automatic generation of lesson plans and pattern changes have impacted the generalized concepts of traditional teachers, and for teachers who have experienced the traditional "teaching and learning", the over-intelligent mode of teaching will only artificially increase the obstacles to teachers' freedom of teaching and the authority of self-expression. "A veteran teacher in the English teaching and research department dislikes the use of such software to assist teaching, and believes that teachers will be weakened into teaching assistants in the smart classroom, and that the right to teach is greatly threatened." Ms. Yu had reservations about the promotion of the automatic lesson plan generation system; as far as she was concerned, the autonomy of lesson preparation should not and could not be ceded to the convenience of lesson preparation.

The research team's third point of departure was to examine the infringement of teachers' right to education and teaching through the construction of smart classrooms. The right to education and teaching is more public and professional than personal rights, and is characterized by the professional and personal characteristics of teachers. The right to education and teaching is a prerequisite right for teachers to carry out teaching activities. Article 7(1) of the Teachers' Law of the People's Republic of China states that "Teachers shall enjoy the following rights: (1) to carry out education and teaching

activities, and to carry out education and teaching reforms and experiments", which is an official endorsement of the right to education and teaching at the legal level, reflecting the qualification interests of teachers. Qualifying interests.

The teacher's right to teach is externalized as a legal right based on status. The teacher-student bond, which depends on the special relationship between the student enrolled in school and the school, is recognized by the Teachers' Act as a legal right, upgraded from a natural pedagogical bond to a juridical one. Teachers' education and teaching are directly linked to the cause of education and cultural quality, and are inextricably linked to the overall interests of society and the long-term quality of the nation, possessing distinctive public attributes and overall benefits, and exceeding the scope of the private subject's self-interest, making it more necessary to protect it and more realistic and legitimate.

The right to education and teaching is embodied in the demands and claims of the teaching process. The content of teaching, the teaching method, the criteria for student evaluation, and even the adoption of tools and materials are all included in the domains involved in the teaching process; the teacher's claims and decisions should be recognized and permitted, and the transgressive intervention of the intelligent platform system is a localized occupation of autonomy of meaning.

The right to education and teaching is expressed in the recognition of the subjective qualifications of teachers. Teaching requires a certain level of skills, knowledge and professionalism, and the highly professional nature of the profession has led the teaching profession to require formal qualifications in addition to substantive entry requirements; the setting of credentials and thresholds for entry is a clear indication of the status of the teacher. The prerequisite for the right to teach is closely related to the role recognition of the teacher's personality, and the personal status and dignity of the personality together give the right to education and teaching the value of the human rights specifications on the human rights. The restrictions on lesson plan design and classroom presentation imposed by the smart classroom system impact on the teacher's subjective status, creating the suspicion of being relegated to the role of a system assistant.

The right of teachers to teach is manifested in the inviolable power that teachers possess. The right is a counterpart to the obligation, and the positive right corresponds to the negative obligation of others not to intervene to violate it. The right to education and teaching is explicitly stipulated in national law, and the defense of the state apparatus and the bottom line set by the public authority represent the "infringement" of the negative evaluation, and need to bear responsibility for the consequences. The smart classroom system exceeds the instrumental limits of the means of resource provision and curriculum, with a clear risk of potential infringement.

The right of teachers to teach is reflected in the freedom inherent in the rights enjoyed by teachers. Just as the right of students to learn is a right to freedom, the right of teachers to teach also contains freedom in its core. Teachers play multiple roles in proposing, organizing, implementing and evaluating educational and teaching activities, and they enjoy the right to refuse human intervention in everything from lesson planning to lecturing, and from reviewing to giving feedback. The fact that the smart

classroom system decides for teachers and forces them to provide energy constitutes a threat to their pedagogical autonomy, as all the rights that teachers have to teach are shown to be freedom of behavior under the heading of positive empowerment.

3. Evaluation System

As mentioned earlier, numerous real-life risks have arisen in the practical application of smart classrooms, triggering social concerns; the team thus pondered: can the risk of infringement of smart classrooms be assessed through indexed visual indicators, which can be used as an important reference basis for evaluating the construction of smart classrooms?

3.1 Basis for Determining Assessment Indicators

3.1.1 Legal and Regulatory Aspects

The research team focuses on the two dimensions of qualitative substantive rights and quantitative assessment indicators, grafts the relationship between judicial documents and process evaluation standards at various levels, and constructs two major frameworks for information protection and identity tenure by categorizing them in terms of the effectiveness of vertical judicial systems such as codified laws, statutes and regulations, judicial interpretations and national standards.

The team takes basic human rights as its starting point. China's definition of human rights is at an expanded stage of academic research, and according to Article 33 of the Constitution of the People's Republic of China, "The State respects and safeguards human rights", the protection of human rights should always be given top priority. Therefore, when selecting the first-level indicators, the research team, based on Chapter 2 of the Constitution of the People's Republic of China, "Fundamental Rights and Duties of Citizens", took the teachers and students who are directly involved in the teaching process as the main object of research, and put "students' right to learn" and "teachers' right to learn", which have strong identity attributes, as the main objects of the research. Students' right to learn" and "teachers' right to teach", which have strong identity attributes, were designated as first-level indicators.

The team takes information protection as an entry point. Based on Article 990 of the Civil Code of the People's Republic of China, the Personal Information Protection Law, the Education Law, the Teachers Law, the Law on the Protection of Minors and other laws, combined with judicial interpretations such as the Provisions of the Supreme People's Court on Several Issues on the Application of Law in the Trial of Civil Cases on the Handling of Personal Information by Using Face Recognition Technology, as well as industry and national standards of related technologies, the team screened out "Personal information rights and interests" in the smart classroom application field are involved in the form and infringement situation, which is another "first-level indicator".

The theoretical foundations of the three rights, namely, the right to personal information, the right to student learning and the right to education and teaching, have already been argued in the previous section and will not be repeated here.

Table 1. Legal Basis for Infringement Risk Evaluation Indicators for Smart Classrooms

Hierarchy of legal norms	Name of legal norm
constitution (of a country)	The Constitution of the People's Republic of China
Codex	Civil Code of the People's Republic of China
legislation	Personal Information Protection Law of the People's Republic of China
	Education Law of the People's Republic of China
	Teachers' Law of the People's Republic of China
	Law of the People's Republic of China on the Protection of Minors
	Copyright Law of the People's Republic of China
judicial interpretation	Provisions of the Supreme People's Court on Several Issues Concerning the Application of Law to the Trial of Civil Cases Relating to the Handling of Personal Information Using Face Recognition Technology
national standard	Information Technology Biometrics Face Recognition System Technical Requirements
industry standard	Specifications for the inspection of face recognition technology in portrait identification

3.1.2 Aspects of User Attention

At the level of the research progression of the secondary indicators, the research team focused on the user experience during the use of smart classrooms.

China's protection measures for personal information are mainly from the perspectives of legislation and industry self-regulation. The research team observes the actual use process of smart classrooms, combines with the Fair Information Implementation Principles formulated by the U.S. FTC, and analyzes the application scenarios of each level 1 indicator from the aspects of notification/awareness, choice/consent, access/participation, integrity/safety, and enforcement/complaint, and establishes level 2 indicators, based on which it puts forward more detailed level 3 indicators to establish a system of indicators for evaluating the rights and interests of personal information.

Based on the special status of students, their natural rights with teachers can be transformed into special rights; in the learning process, the smart classroom will inevitably intervene in the interaction and communication between teachers and students, bringing a certain degree of negative impact. Through the observation of students' learning process, combined with the concept of learning right emphasized

in the Declaration of the Fourth International Conference on Adult Education (CONFINTEA IV) of the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1985, the team set up the second-level indicators of students' right to learn, and on the basis of which they decomposed into three-level indicators in a more detailed way, so as to set up a system of assessment for the real problems of the students' perspective in the application of the smart classroom scenarios.

Similarly, teachers are affected by smart classrooms, with implications for their fundamental rights granted by the Teachers' Act. Corresponding to the students' right to learn is the teachers' right to teach. Teachers' teaching process is continuously monitored in the smart classroom environment, and their right to freedom of teaching is inevitably affected to a certain extent. Based on the basic processes of teachers' education and teaching: lesson planning, teaching, homework, tutoring, and evaluation, the research team has established secondary indicators of teachers' right to education and teaching, which are further decomposed into more detailed tertiary indicators, and has established an assessment system for the realities of the teachers' perspective in the smart classroom application scenarios.

3.2 Establishment of a Framework System of Assessment Indicators

The team chose the hierarchical analysis method (AHP), and the final structure of the assessment indicator system is shown in Table 2, with the first-level indicators of the assessment system as follows: the rights and interests of personal information, the right of students to learn, and the right of teachers to educate and teach. After the establishment of the first-level indicators, the three first-level indicators were decomposed into more detailed and specific second-level indicators and third-level indicators from the above three aspects, and a three-level indicator system was established.

Table 2. Tertiary Evaluation Indicators of Infringement Risk in Smart Classrooms

Level 1 indicators	**Secondary indicators**	**Tertiary indicators**	**Description of indicators**
Personal Information Rights A1	User information collection B1	Whether the user is informed C1	Smart Classroom must inform users in a timely manner before collecting information about them
		Does the user agree to C2	Smart Classroom must channel users' consent before collecting their information.
		Whether the form of notification is standardized C3	Smart Classroom must inform users in writing, orally or otherwise, before collecting information about them
		Whether the informative	Before a smart classroom collects information from a user, it must inform the user in plain, understandable language about the

	language is easy to understand C4	
	Whether users can choose whether information is collected or not C5	Users have the right to choose whether or not their information is collected by Smart Classroom.
	Whether users can choose the type of information to be collected C6	Users have the right to choose to have part of their information collected by Smart Classroom.
	Whether users can choose the form in which information is collected C7	Users have the right to choose the form in which their information is collected by Smart Classroom.
	Sensitivity of information collected C8	The information collected by the smart classroom must differentiate between the sensitivities of the and different levels of protective measures and treatments.
	Necessity of the information collected C9	The information collected by the smart classroom must be necessary to and make reasonable and appropriate dispositions of unnecessary information
	Reasonableness of the means by which the information was collected C10	The ways in which Smart Classroom collects information must be strictly based on the informed consent of the user.
User information processing B2	Whether the use of the information collected is	Smart classrooms must strictly regulate the use of collected information

	justified C11	
	Whether the processing of collected information is visualized C12	The process of handling information in smart classrooms must be strictly open and regulated
	Whether the results of the processing of the collected information are visualized C13	The results of processing information in smart classrooms must be strictly public and subject to regulation
	Whether processing of collected information is minimized C14	Intelligent classrooms must implement the principle of minimal processing to handle information
User information storage B3	Uniqueness of storage paths for collected information C15	The pathway for storing information in the smart classroom should be unique, the The subject of information entitlement should be the smart classroom administrator only; If there is no single path of information storage and the subject of information enjoyment involves a third party. Users should be informed and consent should be obtained
	Reasonableness of the way the information collected is formatted C16	When the Smart Classroom formats information, it must not be stored in any form that exceeds the scope of the user's proposed formatting information, and the user must be informed in plain, mobile text language.
	Reasonableness of treatment of incorrect information collected C17	The smart classroom should judge and screen the collected information, and the incorrect information can be formatted, but the user must be informed; Dangerously inaccurate statements by users, Wisdom Classroom has the right to transmit them to the national security and protection authorities.
	Reasonableness	Smart classrooms should be responsible for the safety and security of

	of security of information collected C18	the information they collect and must protect the security of user information
User information access B4	Accessibility of collected information and the results of its processing C19	Users have the right to view their collected information and its status at any time.
	Whether disclosure of collected information is reasonable in the particular circumstances C20	Smart classrooms should disclose user information to the relevant authorities under specific circumstances, but should not infringe on the user's right to privacy or involve sensitive personal information (except for those that jeopardize the security of others, the state, or society)
User Information Appeal B5	Reasonableness of handling of user queries C21	The smart classroom technology provider must develop a Q&A system to answer users' questions about technical operational issues in a timely manner
	Reasonableness of establishment of complaint channels C22	The smart classroom technology side must set up a complaint channel and pay timely attention to the user's experience in the use process
	Reasonableness of handling of infringement of user information C23	The smart classroom technology party must deal with infringement of user information in a timely, efficient, lawful and reasonable manner, and safeguard the users' own legitimate rights and interests through a variety of means
	Whether the determination of the subject of the	The smart classroom technology party should specify in the contract with the purchasing entity the entity that will respond to the lawsuit;

		respondent is clear C24	
	Protection of minors' information B6	Provisions for the protection of minors' information C25	See articles 69, 72, 73 and 74 of the Law on the Protection of Minors. Article 31 of the Personal Information Protection Act Articles 7, 8, 9, 11, 12, 13, 14, 15, 19, 20 of the Provisions on Network Protection of Personal Information of Children
		Collection and processing of information on minors C26	Smart classrooms collect information on minors when Must strictly comply with the relevant provisions on the protection of minors' information
Student Learning Rights A2	Reading and Writing B7	Does the student master the science of reading and writing C27	Smart classrooms should help students master the science of reading and writing
		Are students mastering the skill manipulation of reading and writing C28	Smart classrooms should help students master reading and writing skills operations
	Asking and thinking about questions B8	Adequacy of capacity to answer questions C29	Smart classrooms should have sufficient search and Q&A capacity to meet students' Q&A needs
		Reasonableness of the mechanism for answering questions C30	The smart classroom should establish a reasonable Q&A mechanism to avoid poor, incomplete, unorthodox and excessive answers, to inspire students' thinking and to develop their ability to learn by example.
		Timeliness of the process of answering questions C31	Smart classrooms should conduct timely Q&A to handle students' queries efficiently
		Effectiveness	Smart classrooms should provide timely feedback on student

	of feedback on answers to questions C32	questions and answers to assist teachers in their teaching
Imagination and creativity B9	Whether the definition of creative content is reasonable C33	Smart classrooms should have clear rubrics for defining creative content, and teachers should be informed in a timely manner of any doubts
	Regulatory Compliance for Creative Content C34	Smart classrooms should regulate creative content to help students develop a correct worldview, inspire creative thinking, and stimulate imagination and creativity
Cognitive Human World B10	Whether the emotional needs of students are taken into account C35	Smart classrooms should pay attention to students' emotional needs in a timely manner, should not stifle students' emotional needs, always observe students' psychological state, and provide timely feedback to teachers and teaching administrators
	Whether the cognitive needs of students are taken into account C36	Smart classrooms should reasonably assess students' cognitive needs, calculate students' cognitive levels in a timely manner, pay continuous attention to students' cognitive status, and provide timely feedback to teachers and teaching administrators
	Whether students' cognitive expressions of emotion are considered C37	Smart classrooms should train students' cognitive expression of emotions, rationally guide students' emotions to avoid emotional disorders and attitudinal imbalances, and provide timely feedback to teachers and instructional administrators
	Is the construction of the student's worldview correct C38	Smart classrooms should rigorously construct a scientific worldview, effectively point out student errors, correct students' misbehavior, and provide timely feedback to teachers and instructional administrators
Access to educational	Adequacy of educational	Smart classrooms should have adequate educational resources to support student learning

	resources B11	resources C39	
		Whether education resources are limited C40	Smart classrooms should limit the educational resources stored and strictly adhere to the sequence of students' physical and mental development
		Whether education resources are mobile C41	Smart classrooms should be mobile and efficient in mobilizing educational resources
	Development of individual and collective skills B12	Whether student learning skills are directionalized C42	Smart classrooms should empower students with the immediacy of skill acquisition
		Are student learning skills collectivized C43	Smart classrooms should assist students with skills in a group setting
		Effectiveness of feedback on assessment of student learning skills C44	Smart classrooms should provide timely assessment of student skill acquisition
		Whether feedback on assessment of student learning skills is two-way C45	Smart classrooms should provide timely feedback on students' learning assessment and assist teachers in lesson planning
Right to education and teaching A3	Development of a teaching program B13	Is the development of teacher instructional	Teachers have the right to choose the use of smart classrooms

	program aids optional C46	
	Is the development of teacher instructional program aids modifiable C47	Teachers have the right to regulate the parameters of smart classroom use
Lecture on teaching content B14	Availability of Assistive Technology for Teacher Instruction Option C48	Teachers have the right to choose the use of smart classrooms
	Can assistive technology for classroom instruction be moderated C49	Teachers have the right to regulate the parameters of smart classroom use
Assign homework exercise B15	Whether the way the homework exercises are laid out is optional C50	Teachers have the right to choose the use of smart classrooms
	Whether the parameters for the placement of homework exercises can be modulated C51	Teachers have the right to regulate the parameters of smart classroom use
	Is it possible to select C52	Teachers have the right to choose the use of smart classrooms

	as the method of correction for homework exercises?	
	Whether the parameters of homework exercises' corrections can be modulated C53	Teachers have the right to regulate the parameters of smart classroom use
Guidance for evaluating students B16	Guidance on whether the evaluation function is optional C54	Teachers have the right to choose the use of smart classrooms
	Guidance on whether evaluation parameters can modulate C55	Teachers have the right to regulate the parameters of smart classroom use

3.3 Determination of Indicator Weights

3.3.1 Establishment of Judgment Matrices

The primary, secondary and tertiary indicators of the assessment have been established in the previous article to create a multi-level hierarchical structure. The study adopts the method of expert scoring, solicits opinions from experts in the field of information privacy and education and teaching, summarizes the opinions and results of the experts, improves the initially established assessment framework, and calculates the weights of the assessment indicators to form the final assessment system. The investigation of the weights of the indicators is mainly based on the scores of the experts to obtain the initial data, which lays the foundation for the completion of the subsequent calculations.

Among them, the first-level indicators and second-level indicators are actually calculated through the judgment matrix, and the third-level indicators are used as an expanded decomposition of the second-level indicators, and are temporarily used only as a basis for judging the scoring of the

second-level indicators. The team will further refine the indicators and improve the content in the subsequent research, and use a variety of algorithms to form a more scientific and rigorous indicator system.

The judgment matrix is the basic information of AHP, which determines the matrix elements by taking an element of the previous level as an assessment criterion and comparing the elements of this level two by two. This assessment indicator uses the hierarchical analysis method, and through three rounds of expert discussion, the judgment matrix for the indicator system construct is shown in Table 3-Table 6.

Table 3. Judgment Matrix for Overall Indicator P

P	A1	A2	A3
A1	1	4	4
A2	1/4	1	1
A3	1/4	1	1

Table 4. Judgment Matrix for Indicator A1

A1	B1	B2	B3	B4	B5	B6
B1	1	2	2	1	2	1/2
B2	1/2	1	1	1/2	1	1/4
B3	1/2	1	1	1/2	1	1/4
B4	1	2	2	1	2	1/2
B5	1/2	1	1	1/2	1	1/4
B6	2	4	4	2	4	1

Table 5. Judgement Matrix for Indicator A2

A2	B7	B8	B9	B10	B11	B12
B7	1	1/2	1/3	1/3	1	1/2
B8	2	1	2/3	2/3	2	1
B9	3	3/2	1	1	3	3/2
B10	3	3/2	1	1	3	3/2
B11	1	1/2	1/3	1/3	1	1/2
B12	2	1	2/3	2/3	2	1

Table 6. Judgement Matrix for Indicator A3

A3	B13	B14	B15	B16
B13	1	1/2	1/2	1/3
B14	2	1	1	2/3
B15	2	1/2	1	2/3
B16	3	3/2	3/2	1

3.3.2 Calculation of Relative Importance

The maximum characteristic root of each judgment matrix is firstly found, and then its corresponding eigenvector W is calculated, i.e., $BW = \lambda_{max} \overline{W}$. where the components of W (W1, W2,..., Wn) are the relative importance corresponding to the n elements, i.e., the weighting coefficients. The whole system uses the method root method to calculate the weighting coefficients, and then the 1/nth power, i.e., $w_i = \sqrt[n]{\prod_{j=1}^{n} a_{ij}}$. Subsequent normalization yields the weighting coefficients Wi.

3.3.3 Consistency Test

There can be no perfect consistency in judgment matrices, and the consistency test explores at what level the inconsistency floats so that it does not affect the assessment results. The team uses the consistency indicator C.I., which is calculated by the formula $C.I. = \frac{\lambda_{max} - n}{n-1}$.

Subsequently, the team will define the C.I. thresholds through research, measurement, and expert assessment scoring, measure the consistency of the judgment matrix, and further optimize the scientific and systematic nature of the assessment indicators.

3.3.4 Comprehensive Importance Calculation

The team calculates the composite importance level by the following methodology: a cascading total ranking from the top down, where the summed importance of the indicators at each level with respect to the system as a whole or the overall weighting of the system is derived from the top level.

After calculating the comprehensive importance degree, the team constructed a system of assessment indexes about the infringement risk in smart classroom application scenarios.

4. Concluding

In the research process, the team synthesized a variety of research methods, using literature review, field research, data analysis, index evaluation and other ways to build an assessment index system for the infringement risk in the smart classroom application scenarios. However, the results are not yet mature, and the generalization and detail of the content, and the scientific degree, validity and

credibility of the index system need to be further improved. The team will also make improvements and refinements to the relevant issues in the subsequent research, hoping that the research can become an important hand in assessing the practical application of smart classrooms in the future, and make a modest contribution to the modernization of education in China by utilizing a variety of factors, such as teaching effectiveness and construction breadth.

References

Gong, X. H. (2021). On the Right to Fair and Quality Education in the New Era. *in Educational Research*, *42*.

Liu, D. M. (2014). On the Teacher's Right to Teach. *Journal of Henan Normal University (Philosophy and Social Science Edition)*, *41*.

Shen, T. X., & Wang, C. (2022). On the Right to Study as a Fundamental Human Right. *Human Rights*, *4*.

Xu, J. W. (2020). One event with two endings: A cross-sectional examination of the social risk of face recognition. *Information Security and Communication Security*, *12*(12), 2020.

Zhang, X. D., Wang, F. L., & Zhou, K. Q. (2010). *Systems Engineering*. Science Press.