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***Research Article***

# Construction of Cognitive Function Model in College Teaching Based on Intelligent Informatization

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## Abstract

Cloud computing and big data provide rich data resources. The intelligent informationization has developed rapidly, promoting the intelligent development of college education. For the same educational methods and teaching modes, students have different cognitive functions. This paper studies the application of intelligent informatization in college teaching, and constructs a cognitive function model in education and teaching. The research results show that, with the intelligent informationization in college teaching, the interaction of teacher-student-machine three subject theory is achieved, providing an efficient, open and diverse learning environment. Cognitive function involves human brain activities and thoughts. The application of intelligent informatization in college education can realize the difference evaluation of students, greatly reduce the workload of teachers, and continuously improve students' cognitive ability. This paper provides a theoretical basis for the application of intelligent informatization in college education and the construction of students' cognitive functions.

## Keywords

Intelligent Informationization • College Education • Education Method • Teaching Mode • Cognitive Function

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Intelligent informatization is a new direction and feature of social development, bringing a great impact on people's life and working methods with the development of artificial intelligence and information technology such as Internet of Things (Thow *et al*., 2018). With the development and improvement of the intelligent informatization deep learning algorithm, it has had a tremendous impact on the development of education, injecting new ideas into education and teaching, providing new methods and tools to promote the transformation of educational cognitive functions and teaching effects (Clark, Xu, Unverzagt & Hendrie, 2016). Intelligent informatization is leading the reform and innovation of education and teaching model, and has become a key factor in the development of educational informationization (Al-Mekhlafi *et al*., 2011). The improvement of self-learning ability under the intelligent informationization mode has updated the teaching concept and integrated the development of new era, guided the promotion of inquiry, realized the independent learning of students, and improved of students' self-motivation (Gaysina, Gardner, Richards & Benshlomo, 2014).

The research and application of intelligent informatization in foreign education started earlier and diversified in cognitive function (Vo, Nolan, Bail, Gisiger-Camata & Meneses, 2018). Intelligent informationization provides teachers and students with a better education and learning platform through computer and teaching platform, providing a good learning environment via recording, observing and understanding the learning process. The existing standard and comprehensive intelligent informationization teaching platform is MOOC, which is applied in teaching to effectively improve the teaching efficiency (Jun, 2015). Some scholars have studied the educational resources environment from the perspective of the intelligent informationization of learning environment and the adaptability of educational resource environment, and proposed that intelligent agent roles such as smart teachers can provide adaptive resources and services for learners (Ishioka *et al*., 2016). Based on the trend of intelligent informationization, this paper studies the innovation of intelligent informationization to promote the education and teaching in colleges and universities, and constructs the cognitive function model in education and teaching.

## Intelligent information promoting the development of education and teaching environment

The application of intelligent informatization in college education and teaching, through intelligent mining and analysis of data, can predict students' learning performance, and formulate strategies to improve students' academic performance (Crowe *et al*., 2013). Intelligent informationization has different goals for college administrators, teachers and students. University administrators can evaluate teaching performance and allocate educational resources properly; Teachers can obtain feedback, reflect on teaching methods, implement interventions, and discover learning patterns; Personalized learning can be realized, promoting learning performance, allocating learning resources and tasks reasonably according to their individual characteristics, and improving learning efficiency (Masel, Raji & Peek, 2010).

The development of intelligent informationization has promoted advanced technology and tools, which will be applied to the education and teaching of colleges and universities, helping for education and teaching.

Furthermore, college administrators can build an educational and learning environment that facilitates teacher-student interaction through intelligent perception. The mature intelligent teaching platforms include the Rain Classroom, IFLYTEK, and Geek Big Data, which show high efficiency, individuality, data-driven, virtual and real integration in education and teaching. The intelligent informationization of the teaching platform enhances the accuracy of teaching, promotes the scientific and visual teaching process and expands the sharing of educational resources. Figure 1 shows the intelligent information evolution of learning resources. It does not require humans to develop resource evaluation scales, and the resources are checked and reorganized through intelligent systems. Through the tracking and analysis of resources, optimization adjustments are made. The application of intelligent informationization makes fast update of educational information. Figure 2 shows the push of teaching resource intelligent information, processing and intelligent analysis of the data obtained during the teaching process, and intelligently pushing knowledge are analyzed based on the analysis results and system resources. Then push the next knowledge point according to the knowledge.

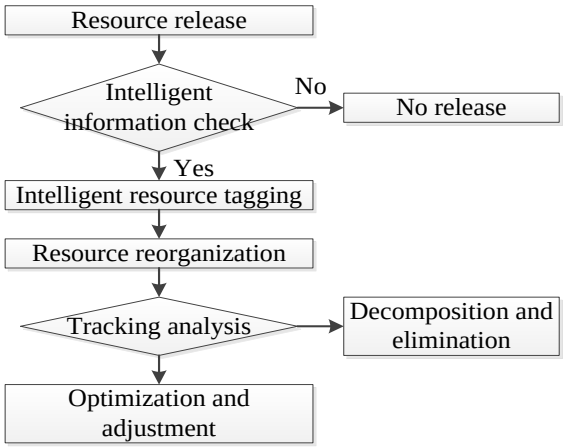


*Figure 1.* Intelligent information evolution of learning resources.

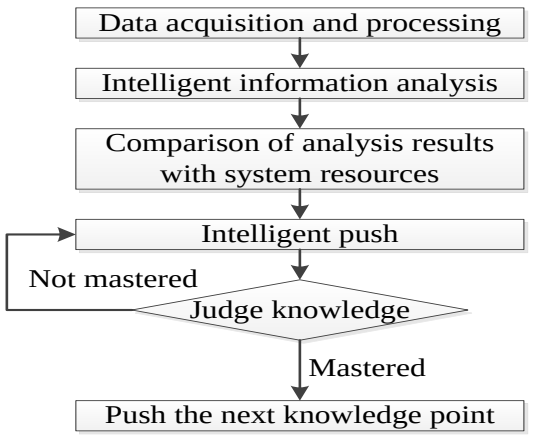


*Figure 2.* Push of teaching resource intelligent information.

## Construction of cognitive function model in education teaching

### Change of teaching methods in colleges and universities

At present, the teaching environment of colleges and universities is characterized by perceptualization, ubiquity, individualization and openness. The development of teaching is from traditional blackboard teaching to later audio-visual teaching (slides, videos, etc.) and digital teaching (computer, Internet), and to the intelligent informationization teaching (including artificial intelligence, big data etc.). In traditional teaching, teachers lack practical sources and support, and only book-based teaching can be carried out, difficult to train students' cognitive model. The intelligent informationization provided students with virtual reality and augmented reality teaching, and strengthening students' cognition functions. Figure 3 shows the changes in the main body of college education, from the original teacher-student dual subject theory to the current teacher-student-mechanical three subject theory, emphasizing that the teaching process shall not only consider teachers and students, but also focus on the interaction between teachers, students and environment (intelligent information).

The cognitive function of the students is cultivated in the learning. The interaction of the three subject theory provides students with an efficient, open and diverse learning environment. Figure 4 shows the intelligent informationization teaching mode. The application of the intelligent teaching platform runs through all the steps before, during and after the class. Before the class, the teacher can implement the intelligent preparation of lessons on the platform and push the teaching resources to the open platform, and students can achieve pre-class study; the intelligent platform in the class can realize the real-time interaction of the teaching process, data recording and analysis of the situation; students can take after-school tutoring and teachers can reflect on teaching using the intelligent platform.

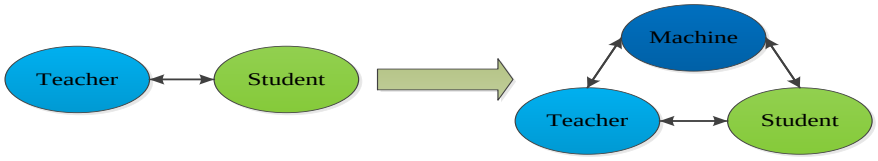


*Figure 3.* Changes in the main body of college education.

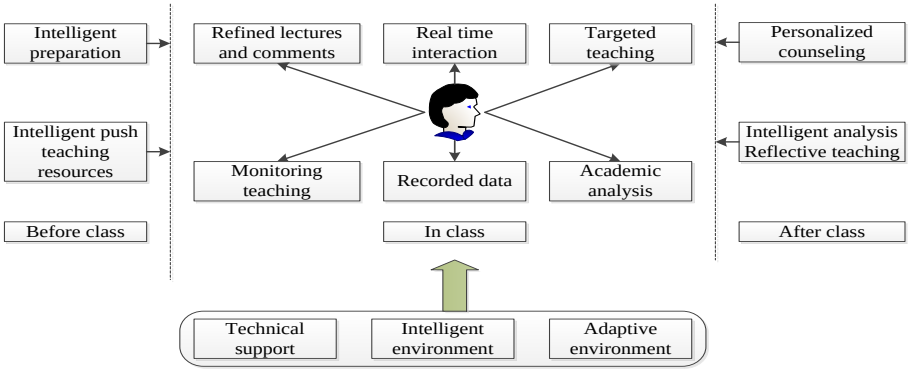


*Figure 4.* Intelligent information teaching mode.

**Cognitive mechanism of cognitive function model in education teaching**

Cognitive function depends on the human brain, and is related to human brain activities and thoughts. It is necessary to explore the cognitive function of college students in the process of teaching. Figure 5 shows the cognitive model in college education. In the process of receiving education, people's brains will undergo ideological changes, which will lead to cognitive mechanisms and psychological changes, and also involve cognitive functions, cognitive mechanisms and psychological changes between teachers and students. The characteristic of cognitive function is that it describes and reverses the conversion link. Cognitive changes are reflected by human psychological, verbal or physiological changes. Some scientists have introduced schema into cognitive function and fixed the knowledge structure of information. The schema presents not only the characteristics, but also the cognitive information. From the various stages of education and teaching, new things, changes and theories that people are exposed to will generate cognitive information. Traditional teaching focuses on the improvement of students' performance and restricts students' creative initiative. With the intelligent informationization education, the cognitive function of the students is greatly enhanced.

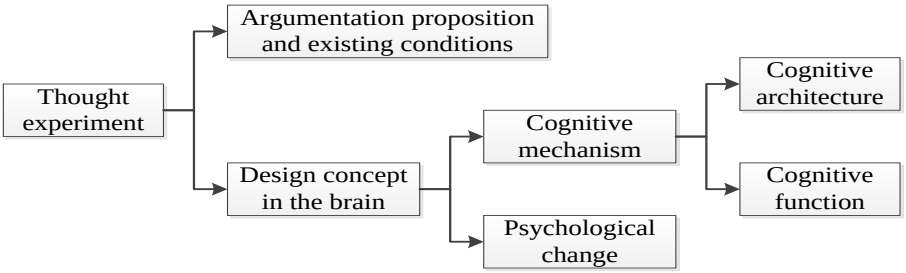


*Figure 5.* Cognitive model in college education (Ideological experiment).

## Intelligent information promoting the development of teaching cognitive function model

**Intelligent assessment**

The intelligent informationization teaching platform provides students with digital learning resources, environment and methods, realizes individualized learning, and promotes students' independent innovation ability and cognitive function. The process of intelligent informationization learning is the process of cognitive function construction. Figure 6 shows the intelligent information learning process. The intelligent informationization teaching platform can realize intelligent interactive learning through intelligent tools, resources and service support, realize intelligent companionship through guided inspiration, achieve adaptively preview of new knowledge through perceived needs, and realize intelligent guided deep learning through scientific analysis of customized content.

Efficient teaching methods gradually change with the improvement of intelligent informationization, but the educational mode of colleges and universities still implements the model of “teaching + assessment”. The assessment process is the process of describing people's cognitive functions, but it is also affected by people's emotions or the external environment. With the intelligent information-based teaching platform, the standard assessment is automatic and intelligent, greatly improving the timeliness and accuracy of assessment. The characteristics of intelligent informationization evaluation are reflected in the scientific evaluation results and the timely feedback. In the teaching activities, the students' learning ability is acquired in the intelligent informationization teaching platform, the questions with different difficulties are prepared, and the correction and report analysis are realized automatically, reducing the workload of teachers, and the cognitive functions of students are comprehensive.

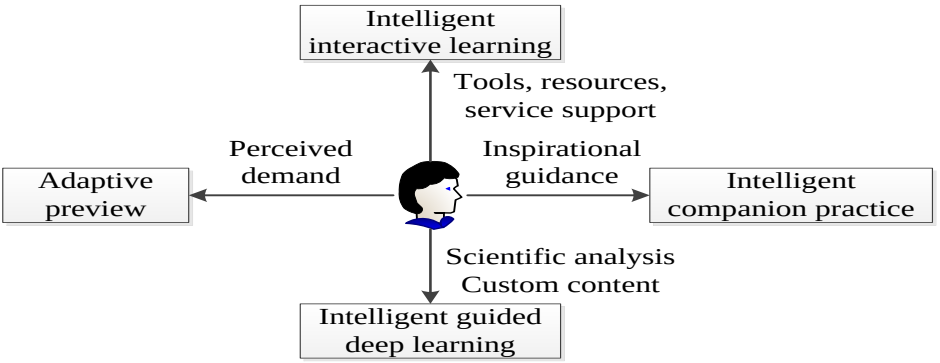


*Figure 6.* Intelligent information learning process.

**Difference evaluation**

For the same educational methods and teaching strategies, the students' cognitive functions are different, and the differences in learning are obvious. The brief assessment is unreasonable. According to the analysis of multiple intelligence theory, the cognitive function of students is somewhat congenital and needs to be evaluated differently. The principle of difference evaluation is the principle of development, the principle of pluralism and the principle of motivation. By collecting data from the learning process of students, the evaluation of students' all-round and difference is realized.

## Conclusion

Based on the intelligent informationization, this paper studies the innovation of intelligent informationization to promote the education and teaching in colleges and universities, and constructs the cognitive function model in education and teaching. The specific conclusions are as follows:

(1) The intelligent informationization provides students with virtual reality and augmented reality teaching, strengthens the cognitive function, and realizes the transformation from the original teacher-student dual subject

theory to the teacher-student-mechanical three subject theory, focusing on the interaction between teachers, students and the environment (intelligent informationization).

(2) For the same educational methods and teaching strategies, students' cognitive functions are different. With the application of intelligent informatization in college teaching, individualized learning of students is realized, promoting students' independent innovation ability and cognitive function, and achieving a differential evaluation of student education.

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