Transforming knowledge into intelligence

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ABSTRACT

This paper proposes a novel education paradigm named Wisdom Class (WisClass), comprising three main pillars: Virtual Learning Environment, Mobile Learning Community and Ubiquitous Network. The WisClass teaching mode boasts the new characteristics of independent learning; inquiry learning; and collaborative learning. The paper contains the following contributions: (1) Define WisClass: Due to the diversity of WisClass, it is necessary to comprehensively cover WisClass from many angles, including Intelligent Contents, System Implementation and Classroom Infrastructure. (2) Summarize the Innovation of WisClass: We propose to shift from the conventional Knowledge Class (KnoClass) paradigm to a new WisClass paradigm. More elaborately, a) WisClass improves teaching theory from teacher-oriented to student-oriented; b) WisClass improves teaching paradigm from static state to dynamic state; c) WisClass improves teaching strategy from teaching knowledge to cultivating wisdom; d) WisClass improves teaching method from closed class to open class; (3) Analyze the characteristics of WisClass: Through massive researches and deep analysis, we explore the WisClass from three characteristics. a) WisClass Teaching: WisClass has a process of enlightening, situational, dynamic, and innovative teaching; b) WisClass learning: WisClass has a process of constructivist, inquiring, blended and cooperative learning. c) WisClass Environment: WisClass has a digital, interactive, dynamic and situational environment. (4) Construct a real WisClass: We construct a real WisClass by cooperatively building hardware environment and software system as a holistic design system. a) The hardware environment includes cloud server, WiFI server, hardware equipment; b) the software system contains cloud platform, online/offline learning environment, leaning evaluation system and Trinitarian learning material system. Our work will play a promising role in the future development of several system design perspectives: (1) Intelligent contents.

Keywords: Wisdom class, situational teaching, student-oriented, inquiry learning, open class.

INTRODUCTION

In order to better cultivate wise learners, the teaching environment and objective are both focused on intelligent teaching methods. Specifically, a) it takes the educators’ wisdom teaching method as essential condition; b) it takes the digital teaching environment as material basis; c) it takes the learners’ wisdom development as teaching objective. WisClass incarnates the think of “Transforming Knowledge In to Wisdom”. (2) Classroom Infrastructure: The intelligent teaching in WisClass hinges upon perceptive, dynamic, active, open and wisdom of physical space. In order to provide a human-friendly space, it is important to have WisClass Infrastructure equipped with modern IT devices, for example, audio-visual equipment, computer and interactive whiteboard and internet-
accessible teaching materials. Especially, the last system encourage educators and learners to timely access the resources and update learning materials. In addition, an ideal infrastructure should also support various WIFI-accessible and internet-enhanced teaching tools such as Distance Learning and Learning Community. WisClass facilitates intelligent teaching environments. Moreover, it can seamlessly integrate people, devices, resource, environment, thought and methods. All this together make it feasible to realize multiple intelligent scenes teaching and man-machine interaction.

System Implementation: In order to provide an intelligent and informational classroom, we incorporate modern and most advanced IT. The purpose is that WisClass may improve teaching paradigm in the aspects of three-dimensional interaction, smart evaluation and information push. WisClass provides a natural platform which integrates IT and class teaching.

With the advance in Information Technology (IT), it becomes possible to elevate the entire education paradigm to a brand new level. More specifically, it is time to transform the paradigm of simply teaching knowledge to one which cultivates wisdom of the learners. To this end, we propose a novel paradigm named Wisdom Class (WisClass). The three main pillars of WisClass are: virtual learning environment, mobile learning community and ubiquitous network. The Wisclass teaching mode boosts the new characteristics of independent learning, inquiry learning and collaborative learning.

For the diversity of WisClass, WisClass has different definitions. More generally, WisClass offers a holistic combination of IT and education, with its main emphasis placed on the wisdom in education. The key lies in a notion of “wise-everything”, such as wise teachers, wise students, wise teaching environments, wise course materials, wise teaching process and wise evaluations. In such a new teaching mode, teachers can provide a situational, intelligent and interactive learning environment and guide students to use knowledge to find, think and solve problems creatively by combing the IT into teaching activities based on WisClass (David, 2001). WisClass offers many novel perspectives on the formats of dynamic teaching activities, objective of pursuing thinking innovation, process of advocating emotion communication and assessment of developing wisdom, etc. The core of WisClass is the idea of being student-centered by transforming knowledge into intelligence and then wisdom, so that learners can find, think and solve problems actively and creatively. It helps students to treat IT as tools, as it should have been, to enrich their knowledge and wisdom on the way of it. This paper conveys the following key points:

- Intelligent contents: One of the guiding principles of WisClass is that an educator will be able to better cultivate wise learners only by making use of intelligent teaching methods. In WisClass, teaching method, teaching environment and teaching objectives are all focused on wisdom. Specifically:

  1) It takes the educators’ wisdom teaching method as essential condition;
  2) It takes the digital teaching environment as material basis;
  3) It takes the learners’ wisdom development as teaching objective. WisClass incarnates the think of “Transforming knowledge into wisdom”.

Classroom infrastructure: WisClass is a multiple human friendly space equipped with some wisdom devices, for example, audio-visual equipment, computer and interactive whiteboard, which takes WiFi as its controlling core. Educators and learners can seamlessly access the resources. Various teaching methods are supported, including classroom teaching, distance learning and learning community. WisClass facilitates intelligent teaching environments. Moreover, it integrates people, devices, resource, environment, thought and methods together to realize multiple intelligent scenes teaching and man-machine interaction. The intelligent teaching in WisClass hinges upon perceptive, dynamic, active, open and wisdom of physical space.

System implementation: Based on the theory constructive learning, WisClass is meant to provide an intelligent and informational classroom. With the application of some advanced IT, for example, Big Data, ZigBee and Mobile Internet, WisClass can improve teaching paradigm in the aspects of three-dimensional interaction, smart evaluation and information push. WisClass provides a natural platform which integrates IT and class teaching.

The key contributions of this paper are:

- Define WisClass: We try to unscramble WisClass comprehensively from every aspect. Due to the diversity of WisClass, we describe WisClass comprehensively from Intelligent Contents, System Implementation and Classroom Infrastructure.

- Summarize the innovation of WisClass: We elaborate the innovation of WisClass through comparison between Wisdom Class (WisClass) and Knowledge Class (KnoClass). (1) WisClass improves teaching theory from teacher-oriented to student-oriented; (2) WisClass improves teaching paradigm from static state to dynamic state; (3) WisClass improves teaching strategy from teaching knowledge to cultivating wisdom; (4) WisClass improves teaching method from closed class to open class.

- Analyze the characteristics of WisClass: Through massive researches and deep analysis, we summarize the
characteristics of WisClass from three aspects. (1) WisClass teaching: WisClass has a process of enlightening, situational, dynamic, and innovative teaching; (2) WisClass learning: WisClass has a process of constructivist, inquiring, blended and cooperative learning. (3) WisClass environment: WisClass has a digital, interactive, dynamic and situational environment.

- Construct a real WisClass: We construct a real WisClass by building hardware environment and establishing software system. (1) The hardware environment includes cloud server, WIFI server and hardware equipment; (2) The software system contains cloud platform, online to offline learning environment, leaning evaluation system and Trinitarian learning material system.

RELATED WORK

The research on intelligent education can be traced back to 1970s. Max (1991) explained intelligent teaching, teaching situation, teaching tact and the practical significance of education in his works, The Tact of Teaching: The Meaning of Pedagogical Thoughtfulness. He thought wisdom teaching is a form of knowledge and it was very important to concern for children’s learning needs and performance (Max, 1991).

Sandra and David (2014) proposed that education wisdom is the complexity of education reflected in morality. Teaching quality can be improved by realizing moral with wisdom in practice and Howard (2006) clearly put forward that human’s intelligence is multiple and it contains eight abilities in his works, Multiple Intelligences: New Horizons in Theory and Practice. He thought wisdom and tact can be gained in the practice of teaching. Through the accumulation of past experience and the rethinking of the new knowledge, we can really obtain wisdom.

In 1980s, some psychologists began to study the relationship between wisdom and education. The defining event was the Berlin Wisdom Paradigm, researched mainly by Baltes. Based on the explicit theory of wisdom, Berlin Wisdom Paradigm defined Wisdom as a kind of expert knowledge system to solve the practical problems in our life (Motschnig-Pitrik and Derntl, 2008). Michel and Potworowski (2008) undertook a research effort, called “Teaching for Wisdom”, to discuss whether wisdom can be taught. After research, they concluded that wisdom can just be improved by applying knowledge through practice.

USA takes great emphasis on wisdom education. In November 2008, IBM launched “Smart Planet” project which was affirmed by Obama. The strategic vision of “Smart Planet” was to create an interconnection Planet and make it more intelligent. Subsequently, IBM proposed a Wisdom Education Strategy based on the student-centered learning theory. Wisdom Education Strategy included wisdom campus, wisdom classroom and wisdom dormitory, which aimed at developing personalized education (Sharon, 2012; Rosenberg, 2011; Jeong et al., 2011).

In November, 2010, American government published The National Education Technology Plan (NETP, 2010). NETP (2010) put forward some new learning models in the 21st, for example, comprehensive ability assessment, big data analysis for learning and online learning platform, etc (Ertmer and Ottenbreit-Leftwich, 2012).

In 2010, Japan set up the largest national informatization project, called “Future Campus”. This project was designed to connect home and school by establishing some cooperative education platforms. It can provide the e-textbooks and digital resource for learners aged from 6 to 12 and it can also provide studying online by interactive whiteboard and one-to-one application (Ryan et al., 2010).

Singapore intended to construct a wisdom country by using information technology. In June 2006, Singapore government announced their plan, called intelligent National 2015 (iN, 2015), which would take more than 10 years to establish an intelligent country with the aid of some advanced information technology. Wisdom education is an important part of intelligent National, 2015. In recent years, government invested a large number of official resources to carry out “Future School” plan and it built a lot of digital infrastructure, which laid a sound foundation for the environmental construction of wisdom education. Now, 5% of schools implemented “Future School” plan, which combined education with wisdom (Ng et al., 2010; Jung et al., 2012).

Korea issued a long term national strategy, called “Wisdom Education", with a key objective of constructing intelligent schools. Work on this project began in 2011 after some specific proposals were designed. The government pledged that all the schools should be improved into intelligent ones by 2015. Korea placed high importance on educational information construction and formulated special laws and regulations to push forward and guarantee the implementation of the strategy finally. In 2012, some schools had already executed the strategic plan (Hazelkorn and Ryan, 2013; Jo et al., 2014; Sánchez-Escobedo, 2013).

In spite of the current international financial crisis, the European Union continued to push the educational information construction. They worked out a plan, named as “the seventh framework program (FP7)” and clearly defined the goal of wisdom education. They aimed to increase the intelligence level by adopting the teaching theory of “high-tech lead learning” and personalized education (Arnold et al., 2010; Bolte et al., 2012).

From the development of wisdom education, the traditional education industry was greatly impacted by Internet, Cloud computing, Big data analysis, Internet of Things and other advanced information technology. All the countries in the world draw a great attention of the
development of wisdom education. In this context, some new educational theories emerged, for example, personalized learning, multi-culture learning and intelligent learning. Therefore, how to integrate the education with information technology, build a wise education environment and how to develop an innovative teaching method are both hot problems.

**INNOVATION IN WISDOM CLASS**

Here, we analyzed the differences between the wisdom class (WisClass) and knowledge class (KnoClass). In a nutshell, KnoClass is more teacher-centered while WisClass is more student-centered. Namely, KnoClass mainly focused on book knowledge but WisClass was driven by real situation; the process of KnoClass is pre-programmed while WisClass emphasized a dynamic and interactive teaching environment; teaching tools of KnoClass are mainly multimedia CAI (Computer-aided-instruction) and blackboard while WisClass will make a good use of a variety of intelligent teaching tools, for example, electronic whiteboard and smartphone made possible by the modern IT technologies.

*Improving teaching theory: Reformat from teacher-oriented to student-oriented*

Traditional teaching applies “Teacher-Oriented” theory which indicates only the educators can decide what to learn and they just focus on imparting knowledge. It limits learners’ subjectivity, initiative and activity and makes them become “Learning Machine” (David, 1997). But WisClass proposes “Student-Oriented” theory following the learners' physical and mental development. It regards educators as inductor and tracks learners' study status. It aims to develop learners’ intelligence by providing Personalized Learning, Demand Learning and Independent Learning. Based on the theory of "Independence-Inquiry-Collaboration" learning, educators play an inspiring and promoting role in teaching as designers, organizers and guides. They try to cultivate learners’ wisdom by having concern closely for their learning needs and performance.

*Improving teaching paradigm: Reformat from static state to dynamic state*

Traditional teaching is a kind of static method for it is fully implemented as planned, which indicates the content, questions and progress all scheduled in advance. The lesson plans dominate the entire classroom teaching. Learners are just like a Pipeline Product and they cannot internalize the teaching contents as their own knowledge without experiencing the process of exploring knowledge. Conversely, WisClass promotes dynamic teaching by designing adequate questioning resources which can stimulate learners' inquisition desire and provide the conditions for cultivating learners' wisdom. The whole teaching in WisClass is completed dynamically. Educators can adjust their teaching timely by asking questions, observing learners’ behaviours and discussing solutions. Learners can construct their knowledge by exploring problems, accumulating experience and constantly rethinking the work.

**Improving teaching strategy: change teaching knowledge to cultivating wisdom**

Traditional teaching aims to only impart knowledge, which is passed in one-way, from educators to learners. Book learning becomes the only medium of teaching and learners have no space and chance to think except to acquire knowledge passively and mechanically. The solutions to the problems can only be gotten in the form of some abstract text descriptions, but the objective of WisClass is to cultivate wisdom. It transforms the passive teaching style to an active inquiring study. WisClass proceeds from some carefully strategized questions and fully takes into account learners’ main body status and their learning abilities. WisClass makes a classroom full of inquiry. Furthermore, WisClass deeply understands the dialectical relationship between knowledge and innovation. It thought knowledge is the foundation of innovation and innovation is the expansion and enhancement of knowledge. WisClass takes knowledge as basis, innovation as means and wisdom as objective. With the educators’ guidance, leaners can gain wisdom through leaning, inquiring and rethinking knowledge.

**Improving teaching method: Shift closed class to open class**

In the traditional class, both teaching process and teaching environment are changeless. Learners can just learn the fixed contents in a closed class. This kind of uninnovative method causes teaching to loss the proper vigor. It ignores the difference between each individual learner and limits their creativity and wisdom, but WisClass pursues to develop wisdom freely instead of teaching contents closely by providing the open class, open teaching resources and open teaching method, etc. It has built a three -dimensional interactive environment centered on dynamic data analysis and cloud-client application; it has designed some open teaching resources with the features of abundant material (focus on knowledge both inside and outside class), different levels (meet different learners' demands) and fast update (track the academic frontiers); it has proposed a wisdom teaching method based on
WisCl\textsuperscript{ass} intends to cultivate learners’ wisdom by stimulating their potential abilities in a relaxed, open and interactive environment.

**CHARACTERISTICS OF WISCLASS**

The simplest definition of WisCl\textsuperscript{ass} is a classroom full of wisdom, which is a perfect combination of educational thinking and educational emotion and an outcome of the interaction between educators’ wisdom and learners’ wisdom. Based on our analysis, WisCl\textsuperscript{ass} has some characteristics, for example, inquiry, collaboration and diversification.

**WisCl\textsuperscript{ass} teaching**

*Enlightenment*

WisCl\textsuperscript{ass} makes learners become leading characters in study by applying some advanced methods to prompt their positivity and creativity. Specifically, in order to inspire learners’ wisdom, educators should timely train their thinking by catching the moment of learners’ formation of wisdom. Educators want to build an inspired classroom to stimulate learners’ interests in study consciously, where learners’ brains will be in highly excited states and long-term thinking. In an atmosphere of enlightenment and inspiration, learners’ thinking has been activated, their mind has been awakened and their wisdom gradually formed. Educators develop learners’ wisdom using their own wisdom.

*Situationality*

WisCl\textsuperscript{ass} is a kind of experience learning, which focuses on learners’ practical experience and involvement. It thought the process of leaning is learners’ perceptions of the studying environment and the internalization of knowledge must be completed by interacting with some specific situational factors. Educators should provide a more realistic situation to guide learners to experience how to internalize knowledge by means of gathering, analyzing and processing information. Learners can complete their study through situational awareness and situational interaction. In the situational, mobile and perceptive environment, they can obtain the valuable practical problem-solving experience to develop their wisdom.

*Dynamicism*

WisCl\textsuperscript{ass} thought teaching in class is a dynamic process and it has a feature of variability determined by the complexity of teaching activities and the diversity of learning behaviors. Based on observing learners’ performance (weather to participate in teaching activities aggressively, to construct knowledge actively and obtain learning experience dependently), WisCl\textsuperscript{ass} can realize accurate education, which requires educators to quickly judge learners’ mastery-degree of knowledge and timely adjust teaching content. Besides, educators focus on developing learners’ abilities of knowledge internalization and recreation without the limitation of teaching plans. They apply all kinds of dynamical resources (unsolved questions, extracurricular materials, frontier problems) produced in the teaching process to cultivate learners’ wisdom.

*Innovation*

Innovation is the basic method used to obtain wisdom. WisCl\textsuperscript{ass} has pay more attention to enlightened learners’ innovative sense, develop their innovative thinking and improve their innovative ability by encouraging learners to doubt and challenge the taught contents. WisCl\textsuperscript{ass} applies problem-driving method, which indicate educators should ask questions by designing questions and create new questions by answering the old questions, iteratively. Learners can find new problems and new solutions in the process of thinking. Besides, educators are good at sustaining innovations by extracting, restructuring and updating the original knowledge. Learners can overcome the fixed thinking by applying various thinking modes, for example, positive and inverse thinking.

**WisCl\textsuperscript{ass} learning**

*Constructivist learning*

WisCl\textsuperscript{ass} is developed based on constructivist learning theory. It regards WisCl\textsuperscript{ass} as the process of actively constructing knowledge through interaction with educators instead of the process of passively accepting knowledge and mechanically memorizing information. Learners can update their own knowledge system both by processing, encoding and understanding the new learned information and by integrating, assimilating and reconstructing the existing knowledge system. They can build up their new knowledge base by exploring, modifying and updating the existing knowledge and can build up their new learning experience by learning, rethinking and summarizing the new knowledge; they can build up their new learning methods by concluding, comparing and expanding the existing methods. Finally, they construct their own learning systems iteratively, which are more suitable for personalized study.
Inquiring learning

WisClass thought knowledge is obtained through inquiry, not through teaching and its core is wisdom, which is derived from knowledge. Knowledge internalization is an outcome of inquiry-based learning through exploring, rethinking and recreating teaching contents continually. Therefore, the process of learning in WisClass is the process of self-construction of knowledge embodied in developing high-order thinking, having deeper experience and gaining greater insight. Before learning, learners must encourage themselves to find solutions independently through understanding more about problems. In learning, learners should stimulate their thinking sufficiently through reasonable supposition and assumption. After learning, learners can constantly develop their wisdom by accumulating experience. Wisdom will embody its value only when it is applied into practice.

Blended learning

WisClass provides a blended learning environment, which is the combination of traditional classroom and IT. Learners should both take the advantages of traditional learning and E-learning. They must know and be familiar with using the intelligent learning tools. It both brings educators into leading roles in the aspects of guiding, inspiring and supervising and fully reflects learners’ cognition role in the aspects of initiative, creativity and potentials. In traditional face-to-face classrooms, educators have to take more time to explain contents, but in E-learning, it breaks time-and-space barrier and learners can learn knowledge at their own pace and reuse resources. Educators can use more time to develop various activities and promote the emotional communication.

Co-operative learning

WisClass thought wisdom can be promoted in the process of exchanging knowledge. The interaction between teacher-student and student-student inspires wisdom based on the method of learning while teaching. Educators and learners can be interactive with each other in a verbal or non-verbal way by exchanging information, discussing questions or sharing experience. During co-operation, they can not only share cognition and emotion, but also communicate thoughts and values.

WisClass enviroment

Digital classroom

WisClass's foundation is data. In traditional class, teaching plans are almost made depending on educators’ own teaching experience, which lacks theoretical basis. But all of teaching activities in WisClass rely on data. It provides a closed data loop for teaching, including the public data produced in teaching, the feedback data generated in leaning, and the dynamic data created in interaction. WisClass can make accurate observation of teaching and learning based on big data mining. By collecting and processing massive educational data resource, it can precisely analyze learners’ behaviors, deeply understand the status of their knowledge and timely adjust teaching strategies.

Interactive classroom

The main feature of WisClass is interaction. WisClass built a Three-Dimensional, Zero-Distance and All-round interactive space with some advanced techniques, for example, smart mobile terminals, Cloud and WIFI. WisClass breaks the traditional classroom's physical layout and provides an “immersion learning” environment. It integrates teaching equipment, learners and educators, and perception and thinking together to promote the real-time communication and situational teaching.

Dynamic classroom

With the help of IT, WisClass breaks through the limitations of time and space. It can provide more open teaching environment, more diverse teaching methods and various learning resources. It transforms the traditional closed classroom into an open and diversified one. It integrates pre-class stage, while-class stage and post-class stage together. In such an open learning environment, it breaks down the barriers between learners’ perception and behavior, classroom teaching and after-school study, time and space.

Situational classroom

We can apply some intelligence techniques, for example, Internet of Things, Cloud Computing and Data Mining to track and express thinking process based on numerical method. Therefore, the learning process can be perceived. WisClass can push the intelligent resources to learners based on context-awareness. It takes the advantages of intelligent data mining and smart sensors to know exactly learners’ personality differences, knowledge background, learning state and learning needs.

TEACHING PROCESS IN WISCLASS

This paper designed a new WisClass teaching model by
analyzing each factor and its characters in the entire process of teaching and learning, WisClass teaching model includes three stages: before class, in class and after class and three objects: educator, learner and platform and three relationships: teaching and learning, resources quantity and learning effectiveness, system flexibility and curriculum quality (Figure 1).

**Before class**

**Pre-design plans intentionally**

With data-capture technology, WisClass Information Platform can understand learners' problems and predict their needs through analyzing their learning behaviors' characteristics and study state. According to those analyses, educators can pre-design the accurate lesson plans and push some appropriate learning materials.

**Prepare lessons co-operatively**

By using mobile communications tools, learners can get preview materials instantly and they can share their outcomes, ask questions or put forward ideas in WisClass forum. All their behaviors will be tracked and recoded.

**In class**

**Push personal information**

Educators introduce contents by setting proper learning situations with the help of real-time information push technology. When teaching, some personalized learning materials retried by a kind of hierarchical resources management system are pushed to learners, simultaneously, which can solve learners' problems arising in preview pertinently. It makes learners found the appropriate subjects right for their own learning ability and they can engage in learning activities as soon as possible.

**Achieve accurate teaching**

In class, educators and learners can interact with each other in forms of group discussion and immersive learning with multi-terminal sharing technology. In their interaction, educators can capture the dynamic learning status of the learners and adjust teaching based upon their behaviors and performance concluded by intelligent data analysis and evaluation techniques. Meanwhile, educators can make more reasonable and accurate plan for each learner according to his real learning ability obtained by data analysis and educators’ teaching experience.

**Develop inquiring learning**

Learners can internalize teaching contents as their own knowledge through inquiring learning. Further, they can find some proper partners in online community to solve problems together, which expands the scope of communication greatly. For the questions unsolved in class, learners can use real-time records and broadcasts system to automatically record all their questions and post them on the forum, simultaneously, which breaks the time and space boundaries in classroom. It extends the depth and width of inquiring learning.

**Do real-time evaluation**

After learning, educators push the personalized quizzes to each client. Learners finish the quiz in class and get the
result and learning evaluation in real time.

**After class**

**Assigning homework**

Educators assign different homework to different learners based on stratified teaching theory. When learners complete the basic exercises, they can get the scores instantly by the real-time automatic judge system. Thereafter, educators push more resources according to learners’ ability and make them get an appropriate development.

**Complete homework**

Learners can do the homework anytime and anywhere by the mobile terminals; they can also select the resources which are right for them to freely consolidate knowledge.

**Online tutoring**

Educators record some specific video clips for solving some problems that appeared in classroom study or homework and they play the role of online instructor to do one-to-one personalization counseling.

**Iterative introspection**

After completing the homework and reviewing the video tutor, learners are encouraged to express their opinion or dissent through forum. They reconsider the knowledge they learned by exchanging information and discussing issues with their educators and classmates in an open environment. By means of iterative introspection, leaners can obtain their own knowledge.

**CONSTRUCT WISCLASS FRAMEWORK**

The construction of WisClass includes two parts: building hardware environment and establishing software system.

**Building hardware environment**

Figure 2 shows the general framework of WisClass. WisClass is an intelligent, open and interactive digital space, which is built on the bases of dynamic data analysis and Cloud technique. It creates a wisdom learning environment by installing some advanced electronic equipment to break the limitations of time and space in classroom. By better integrating the physical space and information space, WisClass can offer greater teaching and learning varieties. As such, it creates an education environment more dynamic, flexible and versatile than the traditional classroom.

**Cloud server:** Cloud Server provides storage, computation, networking, unified communications and recourse management. It establishes a localized database to store teaching video and digital resources, builds wireless local area network to realize multiple modes of interaction between educators and learners and adopts satellite linking route to achieve on-the-spot teaching.

**WIFI Server:** WIFI Server is deployed in every corner of the classroom. Through a high-density WIFI environment,
Educators and learners can connect with each other more easily by mobile devices and all kinds of teaching data can be collected dynamically. Furthermore, the teaching contents played in educator’s terminal can be broadcasted to learners’ terminals. Therefore, educators can teach anywhere.

**Hardware equipment:** WisClass uses some advanced technologies, for example, GPS, Virtual Reality, Wearable Device and Bluetooth to create a three-dimensional, open and intelligent space. It integrates virtual learning environment into actual teaching environment, such that classroom is not a closed space just equipped with fixed desks. Instead, WisClass integrate teaching with learning and discussing by offering various modern teaching equipments, for example, electronic platform, whiteboard, television walls, DVD camera and mobile terminals. It breaks the unconnected traditional layout of classroom and instead, puts desks around a circle, which achieves barrier-free communication. Educators can use mobile devices (stylus, mobile phone and PAD) to control their PowerPoint presentation anywhere. They might even turn a slide by gesture with gesture recognition technology. They can also know learners’ real-time status according to the dynamic statistics chart got by data mining technology. Learners can receive homework, resources and quiz instantly. And with high-density covered WIFI, it can realize immersive learning, which indicates learners can interact with all the other users both in classroom outside, anytime and anywhere. Besides, they can obtain several necessary learning tools and recourses.

**Establishing software system**

From a software perspective, WisClass is a wise Education Service System, including three objects-platform (server, client, database), user (educators and learners) and activities (teaching actions and learning behaviors) and five stages-preview, teaching, learning, review and evaluation. WisClass software system has the features of “store resources layeredly”, “push materials timely”, “analyze data automatically” and “make evaluation immediately”.

**Cloud platform:** Cloud platform is the foundation of WisClass software system. It provides all kinds of services for infrastructure layer, application layer, client layer, data layer and platform layer. It can store resources layered according to different objects and purposes; it can push personalized materials timely and actively by associating teaching contents with learning needs and by considering both teaching environment and learning time, it can collect the learners’ feature data, related to their personal interests, learning preference and cognitive habit and their status data, related to their learning status, mental status and attention status, automatically; it can exchange information instantly by providing several real-time communication services.

**Seamless O2O learning environment:** O2O is short for online learning to Offline. WisClass takes full advantages of online learning and offline learning by expanding offline teaching’s scale with online learning and improving online learning’s quality with offline learning. Based on the theory of O2O, learners can get more personalized and teaching services provided by online learning and their learning effect can be tested through offline learning. WisClass creates a seamless O2O learning environment by bring online visual space and offline actual space together, where online space provides support services and offline space completes the concrete teaching activities.

**Comprehensive learning analysis and evaluation system**

Large volumes of data will be generated during learning and this valuable data can provide the scientific basis for personalized and adaptive services, including diagnosing learner’s behavior, pushing the proper materials and assessing the learning effects. With the help of educational data mining and learning analytics, WisClass can explain the past learning performance, adjust the current learning strategies and predict a future state. Learners can have a good understanding of their study and know the possible result timely. Furthermore, the result of those analyses can enrich the standard of evaluation, which leads to multi-evaluation system. It pays more attention to subjectivity evaluation, for example, self-evaluation, mutual-evaluation. For more intuitive result, evolution is expressed in forms of nicely shaded graphs called dashboard.

**Trinitarian learning material system**

WisClass is built on the principle of “learner-centered” that humanistic psychology follows. Therefore, learners are the beginning and aim of wisdom education. In order to cultivate learners’ wisdom, WisClass proposes a new kind of learning material: innovating material on the basis of practice material and teaching material. Innovating material means it can arouse learners’ potentials, improve their learning efficiencies and exert their creativities. WisClass combines teaching material, practice material and innovating material together to construct a Trinitarian learning material system. Specifically, teaching material is used for teaching knowledge, while practice material is used to internalize knowledge and innovating material is used to cultivate wisdom. These three kinds of dominant learning material mode permeate and promote mutually.
and push forward the development of WisClass together.

CONCLUSION

With the advance in the IT technology, the modern education and focus on teaching should shift from imparting knowledge to cultivating learners’ wisdom. It is high time to realize that the classroom is not only a learning environment, but also a place to cultivate and promote wisdom. Therefore, “let the cultivation of wisdom return to education, let wisdom aspire class teaching, promote educators’ development and stimulate learners’ interest” is an important mission of colleges as well as, the goal of innovation and progress. WisClass proposed in this paper caters to such imminent needs of teaching reform. WisClass aims to create a free, open and harmonious atmosphere. It should also take into account the learners’ ability, background and enthusiasm. WisClass internalizes wisdom in the entire process of teaching (before class, in class and after class), involving teaching theory, teaching paradigm, teaching strategy and teaching method. However, WisClass is so complex and as such there is need to resolve more work in further research.

REFERENCES


