A survey on the present situation of students' educational technology ability at a normal college

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ABSTRACT: With the rapid development of educational informationalisation, the Ministry of Education now requires teachers to have higher educational technology ability. *The standards of educational technology ability of teachers in primary and secondary schools* is China's first standard about teachers' professional competence; the promulgation and implementation provide standards, as well as guidelines for the cultivation of college students' educational technology ability. Based on the *standards*, this article reports on research on the present situation of students' educational technology ability in Handan College, based on a questionnaire survey and case interviews. In order to match the requirements in the *standards*, the questionnaire was designed in four parts: attitudes and awareness; knowledge and skills; application and innovation; and social responsibility. The article presents statistical analysis of the data to explore the status and relative sufficiency of students' educational technology ability at Handan College. It can be concluded that students' educational technology ability still needs to be improved, and some suggestions for its improvement are provided.

INTRODUCTION

With the development of educational informationalisation, teachers' educational technology ability has become an important aspect in measuring their professional level. In order to meet the rapid development of educational informationalisation, the Ministry of Education promulgated *The standards of educational technology ability of teachers in primary and secondary schools* in 2004 (hereinafter referred to as the *standards*). This is China's first standard about teachers' professional competence, which can provide an important criterion for the definition of teachers' educational technology ability [1][2].

This article reports on a random survey and interviews conducted among the students at Handan College. It also discusses case interviews about related teachers and staff, in order to get a clear understanding of the students' educational technology ability. Then, based on the results, the article concludes by considering the deficiency of students' educational technology ability and offers suggestions for improvement.

THE INTERPRETATION OF THE STANDARDS

According to the *standards*, teachers' educational technology ability should be determined in four dimensions: the awareness and attitudes of applying educational technology during the teaching (including the awareness of its importance, the consciousness of information application, the evaluation and reflection, as well as the awareness of lifelong learning) [3]; the knowledge of educational technology and skills (including the theoretical knowledge of educational technology and basic skills) [4]; the application of educational technology and innovation (including the design of teaching and implementation, research and development, instructional support and management); and the application of educational technology and social responsibility (including the use of information, as well as the dissemination of relevant legal, ethical, humane care, etc, information) [5].

In the four dimensions, *awareness and attitudes* is the prerequisite; *knowledge and skills* is the important foundation; and *responsibility and ethics* provides the basic principles teachers should follow. Before the promulgation of the *standards*, the standard of measuring teachers' educational technology ability was based on teachers' mastery of the skills. That is to say, whether or not teachers used modern teaching media, the teaching effect was rarely considered [6].

The development of educational informationalisation puts forward higher requirements about teachers' educational technology ability [7]. Therefore, only when the teacher realises the importance of educational technology will she/he consciously learn, as well as master the relevant expertise of educational technology. Similarly, while teaching with the new media technologies, teachers will further realise the advantages of the new technology, which in turn can inspire

students' enthusiasm to learn, to explore technology and also to integrate curriculum [8]. Therefore, the four dimensions in the *standards* is a continuum. They are complementary and indispensable.

THE DESIGN OF RESEARCH

Research Methods

This article is based on the results of a survey combined with case interviews and other methods. The questionnaire was based on the four dimensions of the *standards*, these being *consciousness and attitude*, *knowledge and skills*, *application and innovation* and *social responsibility*. The questionnaire comprised 26 multiple-choice questions.

Subjects of the Study

The subjects of this study were normal college students in a non-educational technology major at Handan College, with students from different departments and genders. The departments included Chinese, English, Chemistry and Mathematics, among which liberal arts students accounted for about 62% while science students accounted for approximately 38%. The ratio of male to female students was close to 1.5:1. In this survey, 200 questionnaires were distributed, 182 were returned of which 175 were valid, and the effective rate was 87.5%. The questionnaire data were analysed using Excel software.

SURVEY RESULTS AND ANALYSIS

The Findings about Normal Students' Awareness and Attitudes

Normal students have good awareness and attitudes about the application of educational technology, which are important prerequisites for educational technology training, as well as an important factor in the development of normal students' careers. In the *standards*, the requirements about *awareness and attitude* include the awareness of importance, the awareness of application, evaluation and reflection, and lifelong learning [9]. Therefore, the questionnaire also focused on these four areas for investigation.

In addition to the questionnaire survey, the authors also conducted random interviews in the school library. Twenty students were asked the question: *As a college student, do you know the meaning of educational technology ability?* Of these, 45% had only a general understanding and less than 10% of the students could give a good answer.

Moreover, the majority of students believe that educational technology is equal with the education or some students think that educational technology belongs with computer capability. These findings suggest that normal students' understanding of educational technology ability is still quite limited. Some students had not even heard of the term *educational technology*, let alone apply it during the process of learning.

According to the data above, although 50% or more of the normal students hold *strongly agree* and *agree* attitudes about the *consciousness and attitudes* in the educational technology, the majority of these students did not realise the importance of educational technology. What is more, the students did not have a comprehensive understanding of the meaning of educational technology ability, and most students' understanding was based only on the literal meaning instead of its connotation, which will go against the development of normal students' careers, as well as the process of China's education informatisation.

The Findings about Normal Students' Knowledge and Skills

The knowledge and skills of educational technology are very flexible and real-time. Normal students should master educational technology; they should master the basic theory, as well as research methods for using the theory of educational technology to guide practice and, thus, make the development of educational technology ability better and faster [10].

In turn, the development of educational technology ability will further promote the normal students' learning of theoretical knowledge. The basic knowledge of, and ability with, educational technology are the prerequisite of being a qualified teacher in the information age. However, what the survey showed is that normal students' mastery of related knowledge and ability of educational technology is not optimistic.

The mastery of basic knowledge. Statistics show that among the 200 people interviewed, about 75% thought that they *do not know* or *do not grasp* the basic contents and the theoretical basis of educational technology (see Table 1).

At the same time, they regard educational technology merely as the visual aids or the tools for cultivating students' practical skills instead of putting it in the level of teaching, media technology or education system, and it also lacks the guide of scientific theory.

Table 1: The master of the basic theory of educational technology.

The related knowledge	Full grasp	Basic grasp	Grasp little	Grasp nothing
The basic concepts	2.5%	15.3%	48.2%	4%
The main theoretical basis	1.2%	12.7%	67.1%	19%
The basic content	2.3%	11.1%	69.4%	7.2%

The basic theory of educational technology is an important aspect of students' educational technology ability, whose content include the proficient mastery of it, as well as its application. However, the survey results show that the normal students know relatively more about the concept of information technology, the concept of lifelong education and multiple intelligences, while they know little about educational technologies and concepts, such as the behaviourism, constructivism and humanism (see Figure 1).

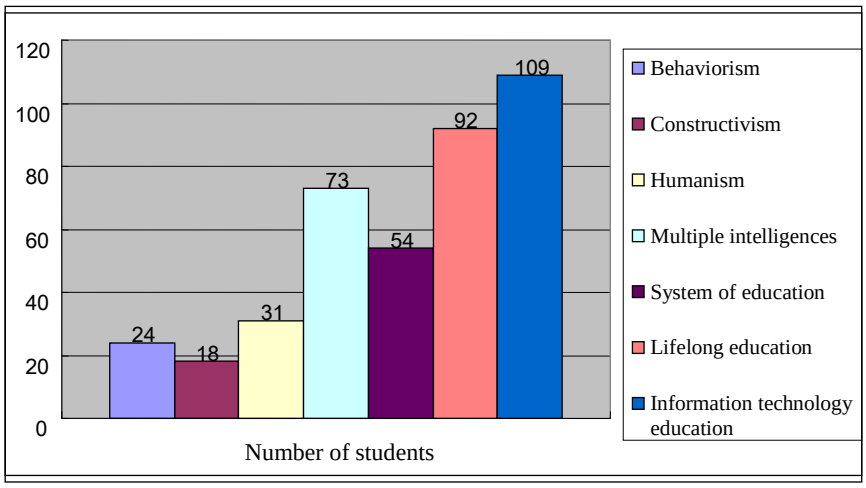

Figure 1: The mastery of the content of educational technology.

Mastery of basic skills. Through the questionnaire, 65.1% of the students responded that they thought that they could efficiently retrieve information associated with teaching resources on the Web or in the library, and 73.8% of the students thought that they could integrate a variety of media into the multimedia teaching courseware by using relevant software. These data indicate that the majority of the normal students have the basic ability of acquiring and using information, as well as equipping with information literacy.

In the applications of teaching software, this study investigated the usage condition of multimedia software, common teaching systems and the equipment grasped by normal students. The data indicate that office software, which normal students can master proficiently include Word, PowerPoint, Excel and so on [11], while for the software of processing images and Web, such as Photoshop, Flash, Dreamweaver, etc, students cannot grasp it as well, which can be seen in Figure 2. Premiere software in particular had been mastered by only five people in the survey. Overall, the normal students' mastery of multimedia software is not ideal, particularly the software for the Web and video, so the ability with software applications of the normal students is limited.

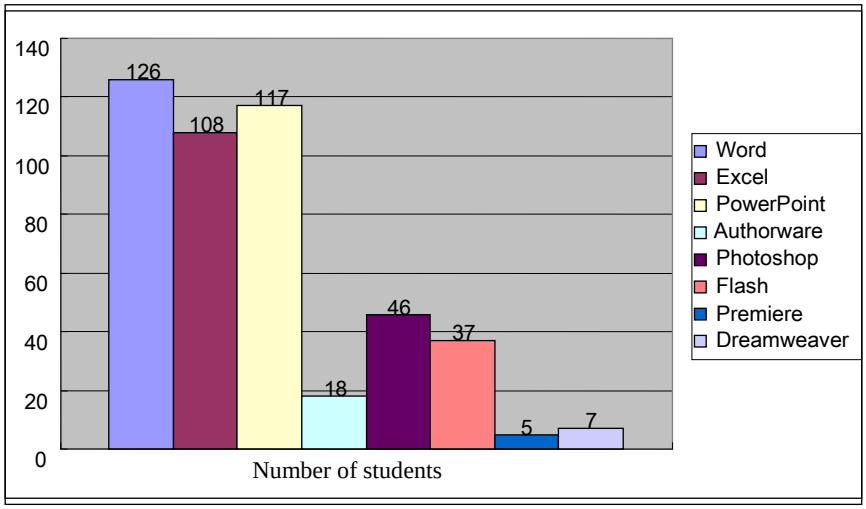

Figure 2: The mastery of teaching software.

Among the instructional media and devices, which are commonly used, students' mastery is superior with multimedia computers, televisions, DVDs and other common devices in life, while for slide projectors, overhead projectors, VCRs, and video Showcase, and so on, the level of students' mastery is still low. The proportions were 16%, 19.4%, 32% and 6.9%; therefore, it can be seen that the majority of normal students have not mastered the usage of these instructional media (see Figure 3).

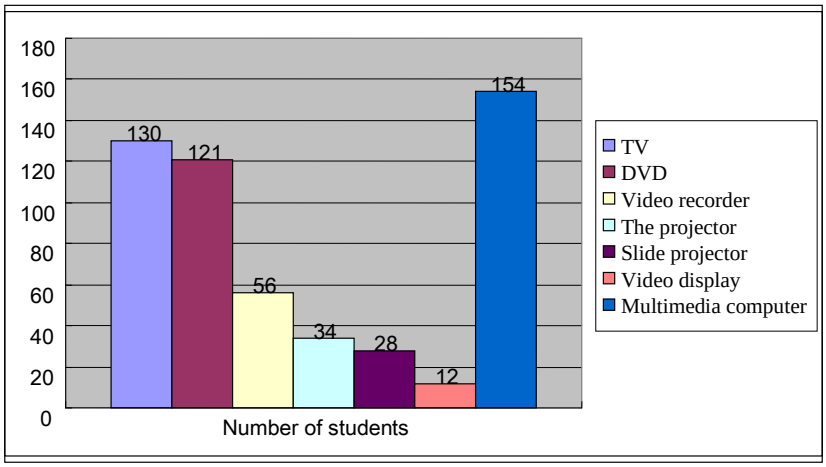

Figure 3: Mastery of instructional media.

The results of instructional design, teaching management and the capacity of evaluation are summarised in Table 2. Among them, the design of teaching system involves teaching objectives, content analysis, media and selection policy and other basic processes [12]. The findings show that about 40% of the students have mastered the knowledge of the analysis of teaching objectives and teaching content, while for learner's analysis, strategy, media selection and the evaluation of teaching, etc, the majority think that they have not developed a related capacity. Especially in the design of teaching evaluation, about 88% of the students have not grasped it [13]. The instructional design part is an important part of educational technology ability; however, the findings shows that students' mastery of instructional design at Handan College is not ideal.

Table 2: The survey results about the *instructional design aspects*.

The name of teaching design aspect	Full grasp	Basic grasp	Grasp little	Grasp nothing
The analysis of teaching objectives	15.7%	30.4%	30.9%	23%
The analysis of teaching content	8.1%	37.6%	30.4%	23.9%
The analysis of the learner	12.1%	20.6%	41.6%	25.7%
The selection of teaching strategies	7.6%	14.8%	45.8%	31.8%
The selection of instructional media	8.1%	10.8%	58.4%	22.7%
The design of teaching evaluation	5.2%	15.6%	68.9%	20.3%

The Findings about Normal Students' Application and Innovation

Normal students' ability to apply educational technology in practice is the core of the whole system of educational technology ability, as well as its fundamental objectives of cultivation and construction. The random interviews found that when they were asked: *As a college teacher, will you encourage your students to connect the information technology with teachers?* And, *Will you download the instructional material from the Internet to help students' learning?*, most of the students showed agreement, which suggests that normal students' awareness and capabilities of applying the information technology are relatively good [14]. However, almost no teachers had personal experience about developing teaching software. This indicates that the normal students' innovation capacity is still relatively low.

The findings show that most normal students are willing to apply educational technology during educational practice, while the lack of individual educational technology capabilities, as well as hardware facilities will constrain the application and innovation of educational technology in practice.

The Findings about Normal Students' Social Responsibility

Teachers should apply educational technology to every student fairly and effectively, and lead students' towards lawful application of modern information technology. When asked their opinions, one responded that: *A teacher should try to let the students of both genders and from all economic status levels share equal opportunity and learning resources* and *Teachers should regulate their behaviour and teach the students the laws and regulations related with technological use as well as teach ethical concepts*. More than 90% of students agreed with this. In the meanwhile, during the individual interviews of several students, most believed that teachers' professional ethics is essential. However, it was

also found that normal students generally lack an effective way to lead their students to use the network correctly, as well as to take their social responsibility seriously. Therefore, there should be further enhancement of normal students' ability with emotional education, because only in this way can they improve their capacity with educational technology, but also let their students master it well.

The Status of Normal Students' Educational Technology

The following statements describe the status of students' experiences with educational technology:

1. Lack of the awareness of educational technology ability. Although normal students have a good understanding of the importance of educational technology, and have a strong awareness of its application and of social responsibility, they lack deep understanding of the specific content of educational technology ability and also the understanding of public course for educational technology. When they were asked: *Do you think it is necessary to set up a public elective of educational technology?*, 35% of the students said *No*.
2. The lack of basic theoretical knowledge and skills of educational technology. Most of the normal students understood certain design knowledge of teaching system, but they did not know how to apply it in practice; most normal students can only use simple office software, while they are not good at some of the related educational software, such as pictures, animation, video, etc. What is more, many of them were unable to use DVD, video and other multimedia teaching equipment well.
3. Related teachers' inaccurate understanding and application of the educational technology. Teachers' educational technology ability can only be reflected by simple use of multimedia courseware, such as via e-mail or communicating with students, while educational technology seldom applies to other aspects, such as management, the evaluation of teaching effectiveness, and so on.
4. The resources and facilities of school educational technology are not perfect. Although schools set up a large number of classrooms with multimedia, other teaching resources are needed to improve educational technology capabilities, such as ancillary laboratories, teaching platforms, and so on. In spite of the fact that the schools surveyed have specialised laboratories, they are only prepared for the students in educational technology majors, while other students have no access to these teaching facilities.

STRATEGIES TO IMPROVE NORMAL STUDENTS' EDUCATIONAL TECHNOLOGY ABILITY

During the cultivation of normal students' educational technology ability, the College should further strengthen awareness, as well as accelerate infrastructure construction. At the same time, the College should make full use of a range of resources and enhance normal students' educational technology ability through various channels, so as to improve their modern educational technology.

Strengthen Normal Students' Understanding about Educational Technology

Before the improvement of educational technology, normal students need to realise the importance and necessity of educational technology. Therefore, schools should offer educational technology courses to let teachers recognise that educational technology, just like other courses such as Mandarin, education, psychology, educational psychology, is an essential professional quality that teachers should have. Moreover, teachers should find their own shortcomings and set learning goals according to the requirement in the *standards*, in this way to stimulate students' enthusiasm.

Strengthen School Building of Teaching Resources, Improve Normal Students' Practical Ability

Educational technology is a very practical course, so in order to improve the quality of teaching, attention must be paid to the practice and to strengthen the construction of the educational technology laboratory. Normal students should have the opportunity to operate some common teaching equipment, such as slide projectors, overhead projectors and video Showcase. Teachers should also encourage students to learn some common teaching software, such as Dreamweaver, Photoshop, Flash, and so on.

Further, schools could make full use of the campus network to build an on-line learning platform through which learning resources and learning strategies can be shared, providing better conditions for students' independent study. Or it could create a QQ educational technology group, and in this way let students acquire knowledge and skills, teach them how to communicate and innovate, as well as help them to form positive attitudes and values and enhance the sense of responsibility and mission.

Improve the Professional Quality of Teachers and Teaching Methods

Appropriate teaching methods are the root of imparting knowledge, as well as achieving teaching goals. Common teaching methods, such as lecture methods do have advantages when the knowledge has strong a theory or system underpinning. But the lecture method is not without its shortcomings, such as it can become boring and too theoretical, and so on. With the unceasing emergence of new teaching methods, teachers should continue to learn and update their teaching philosophy, breaking the traditional teacher-centred teaching mode. They can adopt the best teaching methods

according to the characteristics of different disciplines. In the aspect of teaching methods, teachers should be proficient in using the modern teaching media. Students should actually feel the advantage of modern teaching media, stimulating their enthusiasm for learning media.

Establish an Effective Evaluation System for Educational Technology

Nowadays, many colleges still regard computer grade examinations as the standard of measuring students' IT ability, which is obviously somewhat one-sided. Although the computer grade examination plays a big role in promoting students' computer skills, it also brings about many negative effects. For example, some students take certificates as the ultimate goal, which results in the emergence of new examination-oriented education in computer teaching. Normal schools should actively carry out discussion and research about the competency standards of educational technology; in this way, they could effectively establish the assessment evaluation system of normal students' educational technology ability.

CONCLUSIONS

The cultivation of normal students' educational technology ability is a long-term task. In order to adapt to the requirements of the development of modern education, people-oriented policies must be adhered to, and constantly focussed on improving educational technology ability. Fully mobilising all positive factors and establishing a training system of educational technology ability will help normal students' modern educational technology in a multi-level, multi-channel and full-cultured way.

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