

Teaching and Learning Analysis on IT Course of Grade Five in Beijing – Based on the Report of 3,233 Pieces of Questionnaire Sampling Survey in 2009

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Abstract

It has been required to set information technology as a compulsory course from grade 3 to grade 12 in Beijing since 2001. This study applies the method of questionnaire, based on the sampling survey of 3,233 students (3% of the overall Fifth Grade students in Beijing) in Fifth Grade. Research content mainly includes the following: survey the teachers' teaching behavior of information technology course, learning strategies and motivations of information technology course, learning evaluation and difficulties of information technology course, and learning effect of information technology course.

Keywords: Questionnaire Sampling Survey, Teaching, Learning, Grade Five, IT Course, learning evaluation, difficulties, learning strategies and motivations

Introduction

According to the regulation, *Notice on Setting up Information Technology as Compulsive Course in Primary and Secondary Schools*, of Beijing Municipal Education Commission, Beijing has required opening information technology course in grade 3-12 as required course in 2001. This study applies the method of questionnaire, based on the sampling survey of 3,233 students (3% of the overall Fifth Grade students in Beijing) in Fifth Grade. Research content mainly includes the following: survey the teachers' teaching behavior of information technology course, learning strategies and motivations of information technology course, learning evaluation and difficulties of information technology course, and learning effect of information technology course. Studies have shown the following. (1) Most teachers can adopt appropriate teaching methods to improve the teaching work according to the characteristics of information technology teaching. (2) The improvement of students' learning strategies needs teachers' step-by-step guidance. (3) Students should adopt the evaluation method suitable for the characteristics of information technology

course. (4) The opening of Fifth Grade of information technology course is successful.

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Survey

In the current information-based society, there is growing concern about learners' information literacy. According to *Notice on Setting up Information Technology as Compulsive Course in Primary and Secondary Schools* released by Bei-

ing Municipal Education Commission (2001), it has been required to set information technology as a compulsory course from grade 3 to grade 12 in Beijing since 2001. After years of practice, what is the status of teaching and learning information technology course? Whether pupils master some basic information literacy or not? The research is conducted through questionnaire survey.

Survey Objectives

Through analysis of student questionnaires, it is hoped to know the basic status of Fifth Grade students learning information technology course, analyze relevant factors and expressions that influence teaching quality from students' aspect, and provide suggestions for the improvement of students' information technology literacy.

Methods and Respondents

The survey extracts test samples mainly by multi-stage random sampling and stratified cluster sampling (the basic information needed in sampling mainly comes from *Beijing Municipal Education Statistics (2008-2009)* (Beijing Municipal Commission of Education, 2009). It divides all the districts and counties of Beijing into two levels according to regional feature, i.e., urban and suburban areas, and extracts 96 schools from Xuanwu District, Chongwen District, Fengtai District, Shijingshan District, Daxin District, Huairou District, Changping District, Pinggu District and Tongzhou District by simple random sampling. The total sampling number of Fifth Grade students is 3233, which accounts for 3% of overall Fifth Grade students in Beijing.

Survey Tool and Content

The survey tool is the student questionnaire designed by the research group, and survey content mainly includes teachers' teaching behaviors in information technology course, learning strategy and motivation of information technology course, learning evaluation and difficulty of information technology course, and learning effects of information technology course.

Survey Results and Analysis

Common teaching methods used by information technology teachers

The survey results show that in 20% of class teaching, students do self-directed learning according to task under teacher's guidance; more than 50% conduct concentrated lecture first and then unified operation and practice; that students follow each of teacher's step accounts for 20%; but few students operate freely without teacher's requirements.

Table 1 Statistics on teaching methods of different teachers in Fifth Grade

	Self-directed learning according to task under teacher's guidance	Concentrated lecture first, then unified operation and practice	Students follow each of teacher's step	Students operate freely without teacher's requirements	Missing value	Total
Count	675	1747	689	103	59	3273
Percentage (%)	20.6	53.4	21.1	3.2	1.8	100

Students' learning strategy and motivation of information technology course

Strategies adopted by students when they encounter problems in information technology course

The survey results show that more than 60% of students would ask teacher or classmates for help immediately when they encounter problems, which are seen more in suburban than in urban area; the percentage gradually becomes larger according to the arrangement of operating condition from the good to the poor; 30% of students would search information and find solution on their own first and not ask for help unless they cannot solve.

Table 2 The common practice taken by students when they encounter problems in information technology course

	Ask teacher or classmates for help immediately	Search information and find solution on their own first, and ask for help unless they cannot solve	Find solution on their own, and let it slide if they cannot solve	Let it slide, and do other things	Missing value	Total
Count	2039	984	111	72	67	3273
Percentage (%)	62.3	30.1	3.4	2.2	2.1	100

Main reasons for completing learning task

The survey results show that main reasons for completing a learning task are successively as follows: interest in the task (77.2%), sense of achievement (31.2%), wish for teacher's praise (11.8%), want to finish quickly so as playing games (12.3%). There is no obvious disparity between schools in urban and suburban areas and between those with different operating conditions.

Presently, textbook compilation and class teaching of information technology in primary school generally adopt task-driven approach, i.e., students carry out learning activities driven by a series of typical information processing "tasks". Teachers guide and help students complete a series of "tasks" step by step, from simple to complicated, from easy to difficult. Therefore, most students interested in the task would learn knowledge independently and finish learning task driven by task with clear objective, and then find pleasure and take the initiative to learn with creativity; students gradually learn that success is also an importance impetus for learning. For Fifth Grade students, the enjoyment brought by simple praise cannot compare with that brought by completing a work successfully.

Table 3 Main reasons for completing learning task for Fifth Grade students

	Interest in the task	Sense of achievement	Wish for teacher's praise	Finish quickly so as to play games	Missing value
Count	2525	1021	387	401	0
Percentage (%)	77.2	31.2	11.8	12.3	0

About students' evaluation and learning difficulty of information technology course

Students' opinion on teacher's evaluation of their works

The survey results show that the most favored evaluation method of teachers is to indicate shining points and put forward concrete suggestions for improvement (67%); evaluation without concrete suggestions for improvement (12%) and that with simply "good" or "bad" (18%) receive general effects. Students' works require great efforts, which are not simply made. After handing in, students concern most about whether they can get teachers' acknowledge, and hope to receive proper evaluation and feasible suggestions for improvement. Students are most averse to teachers' perfunctory saying "good, good", and even feel disrespect to their works. Through learning and teaching research, many teachers observe students' works and think carefully before giving clear and significant evaluation with an overall consideration of its theme, creativity and workmanship, and explain for the evaluation. However, some teachers still take no count of evaluation for students' works.

Table 4 Teacher's evaluation when handing in works in information technology course

	Only evaluate with something like "good" or "bad"	Indicate shining point, but without specific suggestions for improvement	Indicate shining point with specific suggestions for improvement	Missing value	Total
Count	596	390	2218	69	3273
Percentage (%)	18.2	11.9	67.8	2.1	100

Learning difficulty

The survey results show that the main reasons for learning difficulty are improper learning approach and little time for computer practice. There is unapparent difference between urban and rural areas in the reasons for learning difficulty, with more improper learning approach in suburban area. The difference is also not obvious between schools with different operating conditions, while students who cannot understand account more in schools with poor operating condition.

Nearly 40% students consider the learning approach is wrong, as the key lies in teachers' improper instruction. The information technology course is technical, and its learning approach is quite different from math and Chinese. It is especially necessary to study the process and approach of mastering knowledge and techniques, which needs correct instruction as well as clear, concrete and progressive guidance. Computer practice is indispensable for the course, which cannot be replaced by any explanation or discussion. In most cases, it is teachers' inadequate awareness, rough design and improper arrangement that lead to occupied time for computer practice or low utilization, and even noisy class beyond control during computer practice in some schools. A minority of students reflect difficult contents beyond comprehension, which also relates to teachers who pay no attention to hierarchical requirements with insufficient individual coaching.

Table 5 Statistics on major reasons for learning difficulty of Fifth Grade students

	Beyond comprehension	Computer failure	Little time for computer practice	Improper learning approach	Difficult learning contents	Missing value	Total
Count	403	311	925	1287	277	70	3273
Percentage (%)	12.3	9.5	28.3	39.3	8.5	2.1	100

About learning effect of students

Main outcomes of information technology course

According to the investigation results, students think that the main outcomes of learning information technology are as follows: master the information technology knowledge and skills (76.9%); broaden their horizons and increase their knowledge (58.9%); learn basic methods to solve problems (45.3%); have some help for learning other disciplines (31.4%); improve their self-learning ability (30.8%). This result shows that setting up information technology course in Fifth Grade is successful. Currently, we should sum up experience and strengthen research to further improve the quality of this course.

Table 6 Main outcomes of learning information technology course by Fifth Grade students

	Master the information technology knowledge and skills	Have some help for learning other disciplines	Learn basic methods to solve problems	Broaden their horizons and increase their knowledge	Improve their self-learning ability	No	Missing value
Count	2518	1026	1483	1927	1009	49	0
Percentage	76.9	31.4	45.3	58.9	30.8	1.5	0

Situation of using the knowledge learnt in information technology course in daily study and life

The investigation results shows that 54.6% of Fifth Grade students can use the knowledge learnt in information technology course in their daily study and life, 27.7% of those who can basically use the knowledge, 15.5% of those who cannot use the knowledge.

In today's information society, applications of information technology can be found everywhere. Through learning information technology course, most students gradually change from paying attention to observation and understanding of the application of information technology to more conscious application of information technology to life (Yin, 2005). This shows that the teaching orientation of information technology course close to students' real life is correct and also shows that students' information awareness and information technology application awareness gradually form. However, it is the consistent task of information technology course to guide students to link learning information technology lessons and real life to improve their consciousness of using information technology in everyday life. Some teachers have not done enough work to guide students to establish link between information technology course and daily life, especially the examples enumerated and learning tasks designed which are away from the students' real life. Thus it is hard for students to experience the application, which not only affects students' interest in learning but also increases learning difficulties.

Table 7 Statistical table of Fifth Grade students using the knowledge learnt from information technology course in daily study and life

	Total non-conformance	Basic non-conformance	Basic conformance	Total conformance	Missing value	Summation
Count	232	276	905	1786	74	3273
Percentage	7.1	8.4	27.7	54.6	2.3	100

Conclusions

Most teachers can adopt proper teaching methods to improve their teaching according to the teaching characteristics of information technology

Since the information technology course was arranged, teachers organized and guided by Beijing teaching and research department have been exploring the teaching methods appropriate for this course. Most teachers can design proper tasks and adopt task-driven or work-guiding methods to conduct their teaching according to the characteristic of the information technology course, which is not only good to motivate the students' learning enthusiasm but also combines dull leaning activities and skill training in the process of finishing tasks or creating works (Zhang & Gao, 2007). Nearly 90% of teachers can pay attention to all students or most students in class. Teachers often use the teaching method of concentrated teaching and then unified practice, which can also receive better teaching effect.

Information technology teachers should also strengthen their teaching research, create teaching methods more suitable for teaching tasks and students' reality, and gradually realize students' self-learning. The situation where teachers do not give enough attention and guidance to students should be improved and the drift phenomenon of non-requirements from teachers and free operation of students should be eliminated.

The improvement of students' learning strategies needs teachers' progressive guidance

Most teachers pay attention to guiding students to choose appropriate learning methods based on the difficulty of learning tasks (Zhang & Gao, 2007). Teachers are also concerned about the students' learning process and carefully study the learning psychology and difficulties of students. Teachers need to arrange learning content based on difficult levels and disperse difficult points. Then through organizing model exchange among students and producing supporting materials to guide students to study by themselves, find information, check help or students' interaction, gradually change the phenomenon of students' over-reliance on teachers, cultivate their good study habits and enhance their learning ability.

Pay attention to adopting an evaluation method appropriate for the characteristics of information technology

Students recognize the evaluation of their works in the information technology course. It is widely believed by students that teachers can not only point out the shining points of their works but also can propose advice for specific improvement, which is believed to be advocated. The information technology course has made lot of attempts on evaluation and changed the method of totally relying on paper and pens and overemphasizing the summative evaluation. In terms of evaluation content, both knowledge and ability and actual application are emphasized. In terms of evaluation method, realize the combination of written test and computer check and the combination of process evaluation and summative evaluation. All of these should be carried out continually.

Information technology course setting in Fifth Grade is successful

Since the information technology course was set in primary school, students have basically mastered information technology knowledge and skill, broadened their horizons, increased their

knowledge and have found it easy to learn other disciplines with its help. What's more, this course has also promoted the students' multi-aspect development, playing an irreplaceable role in cultivating students' information literacy compared with other courses. The course is popular among students. The information technology course setting has made gratifying achievements no matter the school is located in urban area or suburbs or no matter how bad conditions of the schools are. There are certainly some problems and deficiencies. Thus we should sum up experience, strengthen research, improve our work and enhance the quality of this course further.

Suggestions

1. Suggest teachers strengthen their guidance for students on learning information technology. Starting from students' real situation, organically combine the information technology teaching and students' daily study and life in a better way. Teachers should guide students to learn by themselves and take it as their teaching task, gradually developing students' self-study habits and ability. Strengthen the guidance for students with learning difficulties and analyze the difficulties specifically. We can also motivate students to give assistance and implement targeted assistance to each student.

2. Constantly improve the evaluation mechanism of information technology course and emphasize assessment in the application. Before students make works, develop evaluation standards of works and make students understand the standards. Thus they can play a good role of guidance. In terms of the evaluation of information technology course, study multidimensional perspectives and diverse means of evaluation and emphasize the incentive and improved functions of evaluation.

3. Establish monitoring mechanisms about students' network security, carry out positive education for students on network civilization and safety and teach students specific prevention methods to guide them to access to the Internet healthily.

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