

A Study on Lacquer Design Teaching via Digital Platform

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ABSTRACT

Lacquer art is the essence of Chinese culture; however the teaching of lacquer art is unpopular due to the complicated production process. There is little opportunity for primary and secondary school students to access relevant knowledge, and this has resulted in a weak foundation of Chinese lacquer art knowledge. This study researched the lacquer art teaching in primary and secondary education and exerted digital information resources to explore a new learning mode. This study measured the teaching outcomes and summarized the advantages and disadvantages of the teaching methods based on the author's participatory observations and students' after-class questionnaire feedback. The most significant aspect of the study was the hope that Chinese teenagers could have a comparatively early acquaintance of the cultural knowledge for lacquer art and provide more positive social factors for the inheritance and development of future lacquer design.

Keywords: design teaching, digital platform, lacquer design

INTRODUCTION

Research Background

Within the category of lacquer design teaching, courses are mostly presented in colleges and universities, and there is little lacquer teaching for students under those ages. There are three main factors for this: 1) due to the intensive arrangement of the main cultural courses, art courses are condensed, and it is difficult to realize independent class periods; 2) due to the enormous quantity of knowledge involved in lacquer art, expected teaching results cannot be achieved through traditional methods and classroom facilities; and 3) due to the high specialization of lacquer art, common teachers are not capable of taking over the class, while teachers who are knowledgeable in this field have been in short supply for a long time. In sum, it is mainly restricted by teaching time and classroom conditions, which has led to the long absence of traditional Chinese lacquer culture in primary and secondary school education and relatively low social cognition.

With the development of modern science and technology, according to the "Statistical Communiqué of the People's Republic of China on the 2016 National Economic and Social Development" (National Bureau of Statistics of China, 2017), the popularization rate of mobile telephones increased to 96.2 sets per hundred people and the internet population increased by 42.99 million people to 0.731 billion people, of which those accessing the internet via mobile phones increased by 75.50 million people to 0.695 billion people. Thus, it can be seen that there is increasing improvement in the popularization of networking and communications. The convenience of information transfer emancipates the constraint of time, strengthens flexibility and leads to variations in learning models, which has been regularly restricted in classrooms. Furthermore, the objective condition of aiding teaching via digital platform is mature, and the basic condition for strengthening lacquer design teaching using information technology has already been formed.

Contribution of this paper to the literature

- As for the lacquer teaching for middle and primary periods, the study probes into a new learning mode upon the flexibility and popularity of today's network and communication.
- This study achieved the initial comparative research between traditional teaching method and the mode of utilizing digital platform resources.
- As presented by the writer's teaching practice and students' questionnaire data, the lacquer teaching via digital platform obtains more satisfied teaching effects.

Research Purpose

This study was carried out based on the current background condition of China's technological development from the perspective of a teaching-study researcher. The research purpose of this study was to explore a more flexible and interesting learning model via the information superiority of contemporary science and technology and the advanced equipment of digital platform to give primary and secondary school students access to information and to realize the charm and characteristics of lacquer culture, improve the aesthetic abilities, and further enhance the sense of national pride.

LITERATURE REVIEW

In recent years, the art-design teaching in China features increasing popularization but still has some shortcomings. Among those, the more obvious issues are the deficient flexibility in outdated teaching method, short of special courses construction, neglect of traditional culture education, as well as the ignoring of creative thinking training in traditional close-end classroom teaching, which is the main status in quo. Not only the solid systematic basic training, but also the diversity of teaching mode should be focused during the course teaching of art design specialty (Zhu, 2014). The education of design in China has been emphasized on the skill training for a long period, thus generating the shortage of individual creative thinking ability. The emergence of computer enables the diversified development of design, while the traditional design mode is still under various restrictions and requirements (Jiang, 2013).

The increasing influence of computer technology has allowed it to become an effective way for teachers to achieve the combination of computer technology and teaching to enhance learning outcomes (Kirschner, 2015). Mobile digital devices with high popularization improve the variance of learning time, break the limits of traditional academic environments, and effectively maintain the potential learning consistency (Milrad et al., 2013). Practical explorations on aiding teaching via high-tech conditions have centered on design categories, such as construction, and exhibitions have been conducted and summarized (Salman, Laing, & Conniff, 2014). The application of digital science and technology into teaching, the influence of the computer's role in learning modes, and the advantages and disadvantages thereof have become key issues of study (Bernal & Eastman, 2015). In recent years, there have been fruitful results of strengthening design teaching via digital platform in academic studies. However, teaching based on lacquer art design has continued to focus on traditional models, and studies focusing on the practice of strengthening lacquer design teaching via digital platform have not been performed.

RESEARCH METHODS

Action Research Method

This study belonged to the category of teaching practice research. On one hand, both the researchers and the actors should jointly participate in the educational research activities with consistent process between the research and practical activity; on the other hand, the researchers should establish the value system from the perspective of the actors in practical educational environment, thus to facilitate the rationalization of educational practice (Wang, 2013). The most direct way for the researcher to get true feedback from students was to participate in the class as a front-line teacher. Obtaining students' real-time feedback via action research is an effective approach for teaching practice research. As mentioned by Zhang Wenshan, "action research is a method with significant emphasis on the combination of action and research with the aim of discussing the own decision-making model and practice process of the practitioner to get the solution" (Guan et al., 2007). The information obtained from the action research method features a broad range and high trueness, and it is conducive to promoting communication between teachers and students.

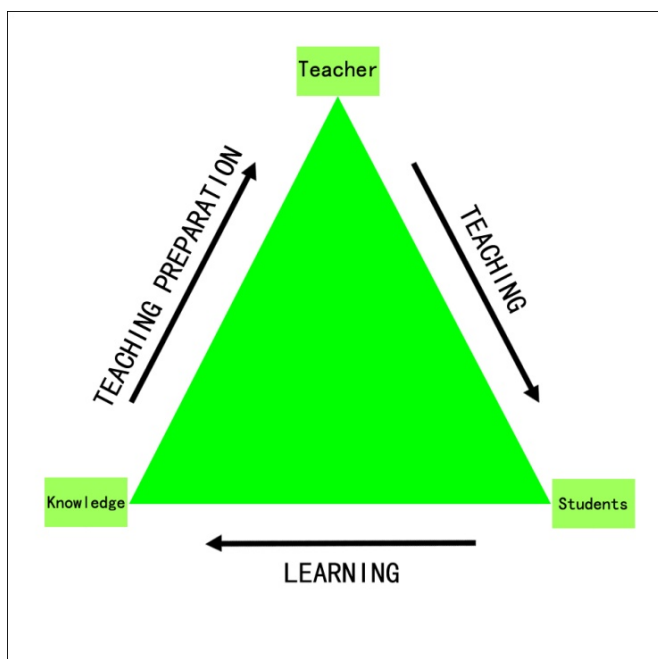


Figure 1. Diagram of traditional lacquer classroom teaching

Comparative Research Method

There are many kinds of objectives for comparative education study, the two most common ones of which are explanation and causal analysis. The purpose of explanatory comparative research is to understand the education phenomenon; while some comparative researches attempt to analyze the causal correlation between two or more education phenomena (Bray, Adamson, & Mason, 2010). According to the viewpoints of Guo Chenjia regarding the comparative research method, “the word comparative indicates the mutual comparison between two or above items; thus, this research method shall be carried on the phenomenon with two or above kinds of different subjects to look for similarities and differences between them” (Guan et al., 2007). This study used the teaching of lacquer design theory as an entry point, and covered the history of lacquer culture development, lacquer design patterns and techniques, and lacquer art techniques, etc. The study was divided into two parts. In the first part, this study adopted traditional teaching methods by using personal examples as well as verbal instruction. In the second part, this study adopted teaching methods via a digital platform. A questionnaire survey was then given to the students in order to summarize the achievements and shortcomings of the two teaching methods and the degree of acceptance. The results could be used for continuous improvement and exploration in the future.

RESEARCH AND ANALYSIS

Traditional Lacquer Classroom Teaching

It is rare that for Chinese lacquer courses to be held in middle and primary schools, and when they are, the teaching model focuses on the teacher’s oral teaching combined with writing on the blackboard and picture descriptions to deepen the students’ understanding. If possible, lacquerware is provided for teaching and outdoor teaching is carried out (Figure 1).

Such traditional lacquer teaching model have lower demand for a school’s teaching materials and mainly focus on paper teaching materials. Students only need to prepare pens and notebooks. In the class, students mainly listen to the teachers to acquire knowledge, and they have time to make notes and learn in a familiar teaching atmosphere. However, the learning environment is relatively isolated, and students have less enthusiasm to communicate with each other. Apart from break time questioning and after-class questionnaires, it is rare for teachers to obtain students’ feedback (Table 1).

Table 1. The traditional lacquer teaching procedures

Step	Time arrangement	Procedures
1	5 mins	Stabilize students' emotions and strengthen classroom discipline.
2	10 mins	Teacher explains the cultural development of lacquer art.
3	10 mins	According to the lesson materials, the teacher explains the material features of lacquer design as well as background knowledge.
4	20 mins	The teacher enables students to know the historical development of lacquer design modeling through hand drawing presentations on the blackboard.
5	20 mins	The picture presentation is combined to conclude several common lacquer techniques for students.
6	10 mins	The teacher gives a brief exposition of the lacquer development status in other parts of the world and introduces several extracurricular books related to lacquer design to the students, such as <i>Chinese lacquer and Design</i> (Zhu, China Architecture & Building Press, 2016) and <i>Lacquer Arts</i> (Zhu, Liaoning Fine Arts Publishing House, 2006).
7	5 mins	Time for answering questions.
8	10 mins	Combining the teaching materials on that day to comprehensively review the contents of the course.
9	10 mins	Asking the students to complete the questionnaire, and collect the results.

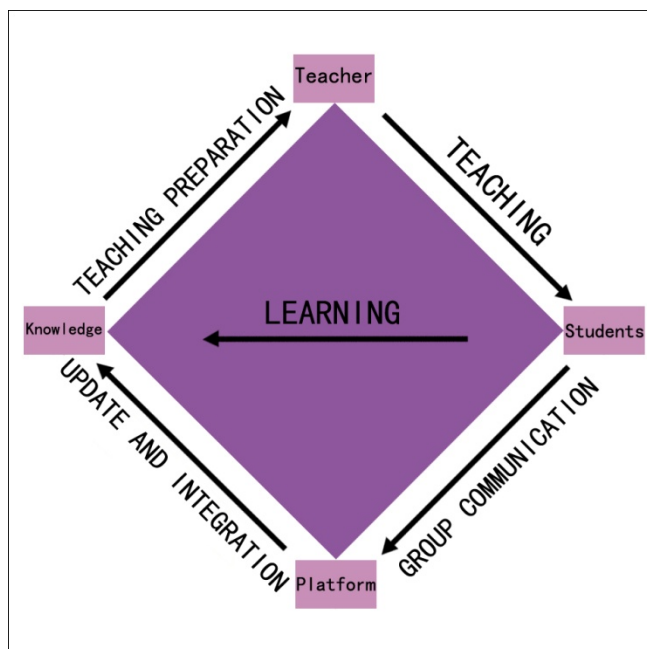


Figure 2. Diagram of teaching via a digital platform

Application of Digital Platform Assisted Lacquer Design Teaching

There is a new procedure to apply digital platform to teach lacquer design theory. First, the school's network connection is necessary, WI-FI must be available, and digital equipment such as computers, projectors, and sound equipment must be provided to classrooms. As for the students, they need to have smart phones, tablets or computers, and they should register a personal WeChat account in advance, so that it is convenient for them to join in the online platform and share digital resources. In addition to the summary presentation of course content, teachers could display lacquer-related video data and HD photos via the digital platform, and achieve real-time sharing of relevant links. Students could immediately read the teaching materials and e-books recommended by the teacher. This teaching mode requires active interaction and cooperation from the students and changes the traditional identity of the teacher from that of a speaker to a sharer of learning resources at the same time. Students could spend their classroom time establishing a shared learning space, which is convenient for after-class communication and free learning via digital platform. Meanwhile, information from the digital platform also realizes updates and integration along with the increase of people following (Figure 2).

For middle and primary schools, adopting digital platform to strengthen lacquer design teaching is a new model, and it could be regarded as interdisciplinary teaching exploration. Rather than expect to figure out definite answers through classroom experiments, researchers hope to apply current technological platforms and effective

Table 2. Teaching procedures via digital platform

Step	Time arrangement	Procedures
1	5 mins	Stabilize students' emotions and strengthen classroom discipline.
2	15 mins	Explain the cultural development of lacquer art and combine with lacquer photos projection.
3	10 mins	Online display of teaching video "China Arts and Crafts: Exquisite Beyond Compare, Gold-inlaid Lacquer" (http://tv.cntv.cn/video/C38459/4155b28b06a64df593c1afe81f918cf4)
4	10 mins	Online display of teaching video "China Arts and Crafts: Lacquer Art of Three Thousand Years" (http://tv.cntv.cn/video/C38459/a4f13ebd8a94487d8e6b03460cd046b1)
5	15 mins	Excerpt display of movie version of "Masters in Forbidden City" with aided interpretation from the teacher.
6	5 mins	Teacher establishes a real-time WeChat group for lacquer design resource sharing and invites the class to join.
7	5 mins	Real-time sharing of links and videos concerning the knowledge of lacquer design for students to check whether the group is functioning properly.
8	15 mins	Suggest students to download e-book apps and recommend several e-books relating to lacquer design, and encourage students to set up an e-book database for after-class free learning.
9	5 mins	Time for answering questions.
10	5 mins	Comprehensive review on the content of the class.
11	10 mins	Ask the students to complete the questionnaire and collect the results.

Table 3. Details of the four teams and groups participating in the experiments

Team's name	Number of students	Age of students	Classroom facility	Average accuracy
Team A	20	8-10	Traditional device	65%
Team B	20	8-10	Digital platform	74%
Team C	22	14-16	Traditional device	70.9%
Team D	22	14-16	Digital platform	83.6%

tools to teaching to provide students with more flexible and diversified approaches for obtaining knowledge (Vial, 2015). This study, under the action teaching model, conducted research on primary and middle schools respectively and emphasized transferring relevant information via a digital platform in addition to the course introduction and content overview (Table 2).

Comparison of Teaching Experiment Results

In order to compare the traditional teaching method and the digital platform-assisted teaching model, the author conducted mobile teaching research for primary and middle school students by organizing two classes, according to the standards of the same school, number of students, foundation, class hours, age level and classroom facility. After the class, the same answer sheets were attached to be used as the measuring standard. In the end, the accuracy of the answers was counted to compare the teaching effects of the two methods via the objective data (Table 3).

The teaching steps of the two models are described in the previous paragraphs and the basic information about teaching objects is displayed out in the above-mentioned tables. Regarding the front-line teaching personnel, the author summarized the following research results through classroom observation (Table 4).

Table 4. Contrast of teaching research results

Content	Traditional lacquer classroom teaching	Digital platform-assisted lacquer teaching
Student's degree of attention	Traditional lacquer classroom teaching focuses on the instructor's oral teaching, in which the classroom atmosphere is relatively silent and students keep their minds on the teacher and illustrated teaching materials.	In digital platform-assisted lacquer teaching, with the guidance of teachers, mobile phones and other equipment are applied, and it adopts data retrieval and sharing learning as the main form of instruction. Students can pay high attention to digital platform and they sometimes communicate with each other in a low voice.
Learning initiative	In traditional lacquer classroom teaching, the teacher will ask students questions about the certain course contents during break time to test the students' learning effect. In that case, students will not actively raise their hands and the teacher must call their names to answer the questions. The after-class questioning link is relatively not active.	In digital platform-assisted lacquer teaching, students will actively ask questions about network information, but the questions raised are sometimes beyond the teaching scope. Lastly, the theme of questioning links mainly centers on communication via after-class online platforms.
Learning effect	The accuracy of after-class questionnaires in traditional lacquer classroom teaching is lower.	The accuracy of after-class questionnaires in digital platform assisted lacquer teaching is higher.

According to the research results, the application of digital platform-assisted lacquer teaching in middle and primary school can make the classroom atmosphere active and improve the learning effect. Thanks to the enthusiasm for science and technology, students can easily throw themselves into interactive learning through digital platform. Teachers not only need to encourage students to communicate with each other, but also keep to the discussion subject in the class, so as to avoid deviating from the main course contents due to the expansion of students' thinking.

Blueprint Prospect for Future Teaching

According to the study results, aiding lacquer design teaching via digital platform is an excellent model with positive significance. For primary and secondary school students, learning by video could acquaint them with lacquer-concerned basic knowledge through explaining the profound in simple terms, and by reading e-books when possible to provide good learning conditions for theoretical knowledge accumulation.

Along with the increasing development of technology, more abundant teaching approaches will be available in the future in virtue of digital platform, and teachers will perform as the designers for technology intensifying and learning (McKenney, Kali, Markauskaite, & Voogt, 2015). Two perspectives were proposed by the author. First is to carry out research and development of apps and games around the themes of lacquer art and learning through entertainment, which are especially suitable for primary school students as games feature a strong visual impact and could give an effective presentation of the Totem ornamentation and color characteristics of lacquer design elements via intuitive visual images. Second is to arrange lacquer art design teaching in class. After all, regardless of whether instruction is based on the teacher's verbal instruction, slide shows of photos, or watching videos of real lacquer design works, it only engages in idle theorizing. Regular courses in middle and primary schools are rarely given together with outdoor teaching and are difficult for students to obtain the feeling of the history of traditional lacquer culture. The development of VR (virtual reality) technology in recent years could solve this problem effectively. Just as VR technology has been adopted as a guidance tool by major provincial museums in China, the action of turning the lacquer art culture of previous dynasties into VR teaching videos to introduce knowledge could create a magnificent lacquer art culture experience for students during tours of cultural relics and historic sites.

Discussion

Lacquer design mainly focuses on the theory teaching in primary and secondary school classes in China and lays stress on the improvement of students' comprehensive aesthetic quality, rather than the capacity in lacquer art works creation. Under the circumstance of smooth network and complete equipment, the application of digital platform in aiding teaching could enhance the efficiency of learning, and so as to achieve the aim of enabling more students to have access to the historical and cultural knowledge of lacquer art.

Compared with the quality-oriented education at the theoretical level in middle and primary school, lacquer design in university mostly takes creative courses as the main line, involving practical operation and practice, emphasizing lacquer's handicraft value, and underlining the touching feeling in hand. University students' sensitivity to lacquer materials does not merely rely on the eyes to feel across the computer screen; hand sensory ability and the ability to control materials are particularly important.

In practice-oriented creation classes, digital platform also plays a crucial part in effective assistance for students in theoretical knowledge acquisition, creation materials collection, on-line study and discussion, and thus to stimulate inspiration and broaden the vision. The high-efficient learning model based on the digital platform enables students to have more sufficient time and efforts to complete their own works, improve their own control ability on lacquer materials and further enhance the practical skills. Therefore, the application of digital platform-assisted lacquer design teaching in university is still useful for students' online communication and knowledge improvement; however, it is necessary to place emphasis on practical skill teaching.

CONCLUSION

According to this teaching experiment, combined with the statistical data of the students' after-class questionnaire, it was clear that the application of lacquer design teaching via a digital platform features obvious advantages that enabled the students to perform free study, collect rich knowledge relating to lacquer art design in a short time, realize resource sharing and real-time updating, and even debate and discuss questions with their teachers. Learning via digital technology is a new global trend and presents a complete teaching model (Sorensen & Murchu, 2006). As a kind of tool, digital platform could be used to bring changes to teaching models and learning styles.

For lacquer design teaching in the earlier grades, it is a part of assistant teaching for aesthetical quality improvement with a large amount of knowledge, but short teaching hours available from school. Teachers, as the course designers, could make the original class become vivid and increase the chances of after-class communication if they teach via a digital platform with diversified teaching methods and extensive connections with teenage life styles. This could play an active role in terms of strengthening the courses' teaching results.

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REFERENCES

- Bernal, M., & Eastman, C. (2015). On the role of computational support for designers in action. *Design Studies*, 41, 163-182. <http://dx.doi.org/10.1016/j.destud.2015.08.001>
- Bray, M., Adamson, B., & Mason, M. (2010). *Comparative Education Research: Approaches and Methods*, pp. 72-73. Beijing: Peking University Press.
- Guan, X. S. et al. (2007). *Design Research Methods*, pp. 279-299. Taipei: Chuan-Hwa Book Co. LTD.
- Jiang, K. Y. (2013). New Thought on Design Teaching. *Course Education Research*, 2, 199. <http://www.airitilibrary.com/Publication/alDetailedMesh?DocID=kcjyyj-xjsjx201302187>
- Kirschner, P. A. (2015). Do we need teacher as designers of technology enhanced learning? *Instructional Science*, 43, 309-322. <https://doi.org/10.1007/s11251-015-9346-9>
- Mckenney, S., Kali, Y., Markauskaite, L., & Voogt, J. (2015). Teacher design knowledge for technology enhanced learning: an ecological framework for investigating assets and needs. *Instructional Science*, 43, 181-202. <https://doi.org/10.1007/s11251-014-9337-2>
- Milrad, M., Wong, L.-H., Sharples, M., Hwang, G.-J., Looi, C.-K., & Ogata, H. (2013). Seamless learning: an international perspective on next-generation technology-enhanced learning. In: (Berge, Zane L. & Muilenburg, Lin Y. Eds.), *Handbook of Mobile Learning*. Abingdon: Routledge, pp. 95-108.
- National Bureau of Statistics of China. (2017). "Statistical Communiqué of the People's Republic of China on the 2016 National Economic and Social Development". Retrieved from: http://www.stats.gov.cn/tjsj/zxfb/201702/t20170228_1467424.html
- Salman, H. S., Laing, R., & Conniff, A. (2014). The impact of computer aided architectural design programs on conceptual design in an educational context. *Design Studies*, 35, 412-439. <http://dx.doi.org/10.1016/j.destud.2014.02.002>
- Sorensen, E. K., & Murchu, D. O. (2006). *Enhancing Learning through Technology*, pp.vi. Hershey: Information Science Publishing.
- Vial, S. (2015). Philosophy applied to design: A design research teaching method. *Design Studies*, 37, 59-66. <http://dx.doi.org/10.1016/j.destud.2014.12.006>

Wang, P. F. (2013). *Theory and Methodologies of Action Research* (pp. 71). Beijing: Capital Normal University Press.

Zhu, L. Y. (2014). The Simple Discussion of the New Thinking Mode in Art Design Specialized Teaching. *Oriental Education*, 8, 293-294. <https://doi.org/10.3969/j.issn.2079-3111.2014.08.284>

APPENDICES

Appendix 1. After-Class Questionnaire of the Course

No.	Questionnaire contents and options	Answer
Question 1	How long is the history of [Vermilion Lacquer Wooden Bowl], the earliest lacquerware discovered in Chinese archaeology? A. 8000 years; B. 7000 years; C. 6000 years; D. 5000 years	B
Question 2	The classic color assortment for China's early lacquer art during Qin and Han dynasty is []. A. Yellow and green; B. Purple and blue; C. Black and red; D. Red and yellow	C
Question 3	The wine container used in the ancient game [drinking wine from a floating cup to wash away ominousness], is called as []. A. Eared lacquer cup; B. round plate lacquerware with stems; C. lacquer casket; D Lacquer wooden spoon	A
Question 4	Which dynasty did China's [single color lacquer coating] originate from? A. Tang Dynasty; B. Song Dynasty; C. Yuan Dynasty; D. Ming Dynasty	B
Question 5	As lacquer art was in prosperous period during Yuan Dynasty, the technique of [] reached the peak of perfection. A. Gold inlay; B. Bodiless lacquerware;; C. Carved lacquerware; D. Namiki	C
Question 6	[] made by Huang Cheng of Ming Dynasty is the only existing ancient lacquering works in China. A. The Artificers Record; B. Xuanhe Painting Book; C. Exploitation of the Works of Nature; D. Records of Lacquering	D
Question 7	After moving the capital to Beijing in Ming Dynasty, [] was set in the imperial city to manage the production of lacquerware. A. The Operatic Circle; B. National Academy; C. Office of works; D. Guoyuanchang	D
Question 8	In the later period of [], the government opened the maritime trade, private maritime trade gained growth and the lacquer art quickly spread to Europe. A. Tang Dynasty; B. Song Dynasty; C. Yuan Dynasty; D. Ming Dynasty	D
Question 9	[] bodiless lacquerware, Beijing cloisonné and chinaware of Jingde town, are jointly named as [Three unique greats of traditional Chinese arts and crafts]. A. Fujian; B. Shanxi; C. Jiangsu; D. Guangdong	A
Question 10	In today's Asian area, which of the following country does not belong to the great lacquer art countries? A. Korea; B. Indonesia; C. China; D. Vietnam	B

Appendix 2. The Accuracy of the Questionnaire

Team A	Accuracy	Team B	Accuracy	Team C	Accuracy	Team D	Accuracy
Student 1	70%	Student 1	80%	Student 1	80%	Student 1	90%
Student 2	70%	Student 2	70%	Student 2	60%	Student 2	80%
Student 3	60%	Student 3	70%	Student 3	60%	Student 3	90%
Student 4	60%	Student 4	80%	Student 4	70%	Student 4	90%
Student 5	50%	Student 5	80%	Student 5	80%	Student 5	70%
Student 6	60%	Student 6	80%	Student 6	80%	Student 6	80%
Student 7	80%	Student 7	60%	Student 7	70%	Student 7	80%
Student 8	50%	Student 8	70%	Student 8	60%	Student 8	80%
Student 9	80%	Student 9	70%	Student 9	80%	Student 9	80%
Student 10	60%	Student 10	70%	Student 10	70%	Student 10	60%
Student 11	60%	Student 11	90%	Student 11	80%	Student 11	80%
Student 12	60%	Student 12	80%	Student 12	70%	Student 12	90%
Student 13	70%	Student 13	70%	Student 13	70%	Student 13	80%
Student 14	80%	Student 14	80%	Student 14	70%	Student 14	80%
Student 15	70%	Student 15	80%	Student 15	60%	Student 15	100%
Student 16	70%	Student 16	50%	Student 16	80%	Student 16	90%
Student 17	60%	Student 17	60%	Student 17	80%	Student 17	100%
Student 18	60%	Student 18	80%	Student 18	70%	Student 18	100%
Student 19	80%	Student 19	90%	Student 19	70%	Student 19	80%
Student 20	50%	Student 20	70%	Student 20	70%	Student 20	70%
				Student 21	70%	Student 21	70%
				Student 22	60%	Student 22	100%

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