

The Influence of Situational Network-assisted Learning Environment of the Dream of the Red Chamber from the Perspective of Science and Technology

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Abstract

Cross-disciplinary integration is one of the most important strategies for current education and technology developments. Although literary creation and technology have always belonged to different disciplines, they have far-reaching effects on each other. This paper addresses the influence of situational network-assisted learning environment in series of novels during the late period of the Qing Dynasty. Scholars at that time have a very strong technological vision and literary creativity. Through observing serial novels in Shanghai at that time, we learn that the demand for a large number of popular literary markets in the Beijing-Tianjin region did cause such works to be released one after another. Therefore, we should re-observe the officer's mind and people's mind during the late period of the Qing Dynasty, and strive to integrate literary thoughts and scientific education in the future world. Therefore, in this paper, we present to students about the paragraphs described in the Dream of the Red Mansion from the situational network-assisted learning environment, in order to stimulate students' motivation and improve their learning efficiency.

Keywords: Cross-domain integration, Dream of Red Chamber, Learning motivation and achievement, Situational network-assisted learning environment

1 Introduction

In the sci-fi literature of the late period of the Qing Dynasty, Baoyu Jia visited the teaching scene of the 50,000-person classroom which called the Shuishih School. Since everyone wears wireless headphones like AirPods, the speaker's voice is very close, just like leaning through the ears. Moreover, when the students of liberal art were in a lecture, students of martial arts went to the beach to perform the exercise, including the use of diving equipment for marine ecological

display. This is the science and technology education environment that Chinese people hope to achieve a hundred years ago. Nowadays, we are re-reviewing these literary works, perhaps this is the beginning of rethinking education.

The rest of the paper is organized as follows. Section I presents the teaching methods from the situational network-assisted learning environment on the Dream of the Red Chamber. Section II introduces the participants and experimental procedure. The satisfaction questionnaire and results are presented in Section III. Finally, we conclude this work.

1.1 Jia Baoyu Reads the Newspaper

In one hundred and twenty chapters of "Dream of Red Mansions", after the end of the examination, Baoyu Jia suddenly disappeared into a huge crowd of people. At the last stop in this worldly world, he appeared in PiLingYi (toponym). One hundred and fifty years later, an 18-year-old youth who once worked as an employee in a Shanghai tea house began to create a science fiction story, called The New Stone. This person is Woyau Wu, an expert who established many Shanghai newspapers in the late 19th century.

Since 1897, Woyau Wu has presided over many newspapers, including "Tzu-Lin-Hu News", "Tsai-Feng News", "Chi-Shin News", "Yu-Yen News" and so on. Later, during the period of the editor-in-chief of "Yueh-Yueh Novels", he wrote many famous literary works, such as "Bizarre Happenings Eyewitnessed over Two Decades" and changed from a founder of the newspaper to "A renowned novelist".

In 1905, the "New Stone" by Woyau Wu is serialized on the "Southern Newspaper". The story began after Baoyu Jia leaving home. After repeating multiple reincarnations and multiple disasters in Ching-Keng mountain. Baoyu Jia suddenly remembered the women in the Grand View Garden that year, which made him only want to go home. When he returned to the worldly world again, the strange thing he saw, at

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first sight, was the newspaper by Woyau Wu.

Baoyu Jia was shocked when he saw the date in newspaper. He wants to ask people where is Jin-Ling City now. At that time, there was only a man, who may be the incarnation of Woyau Wu, in the teahouse. This person only knows that there is a Ning-Kuo Mansion but he does not know if there is Rong Mansion. Baoyu's page-boy in the side interjected: "Don't ignore him. In Nanjing and Beijing, who would not know the social status of our Jia family? Such as Granny Liu, she is a woman from the countryside but she still can find our mansion. "The man listened and said awkwardly: "I just heard what you mentioned, do you ask about the Baoyu Jia's mansion in "Dream of Red Mansions?" Baoyu Jia was very happy to answer: "Yes, but I don't understand what is Dream of Red Mansions. [1-3]" The people smiled ironically: "Do you forget yourself by reading the novel? Why do you want to ask his mansion? Do you want to see Baoyu Jia? Or do you want to see Daiyu Lin?" Baoyu said bluntly: "I am Jia Baoyu." The people in the teahouse looked at the sky, rubbed their eyes, and even more bluntly said: "Not good! I either met a ghost today or met a madman!" He summoned a young boy next to him and said, "I often say that teenagers don't always focus on reading novels. Really, some people make fool of himself. You see that this person claimed to be Baoyu and he only asked Rong mansion, isn't he?" After the conversation, the people who drank tea next to them all gather round. Everyone looked at Baoyu.

The author used the approach of metafiction to describe that Baoyu Jia bought a set of "Dream of Red Mansions" that night. He saw that the book was a foot high. When he saw some names, he was secretly surprised. After carefully reviewing, he was confused and suspicious. The more he reads, the more confused he is. After reading the book, he was still very surprised.

In order to represent that life as a dream and the illusion of fictional literature for people, the novelist deliberately uses the awakening of self-awareness to let the protagonist "Baoyu Jia" watch his own story with bystander vision. This is an approach of metafiction. The rhetoric is used cleverly in this novel. Woyau Wu uses the bystander vision of Baoyu Jia to satirize the connection between the novel and reality. In fact, it really has the potential to make people falling into madness when you read novels. After teasing Baoyu Jia in the teahouse, we should enter the world of science by Woyau Wu's writing style and understand what is the dream of literary and the enthusiasm of science.

1.2 The Novelist is also a Science Buff

Later, Baoyu Jia accepted the suggestion of others to take a ship to Beijing and visited the new school at that time. Woyau Wu's pseudonym used in this novel is the old boy. In this story, there is a man named the old boy

either. Therefore, it seems that the author writes this novel with himself as the protagonist. He made an appointment with Baoyu Jia to visit the Shuishih School. They walked slowly on the Chuiyang road. Suddenly, a big bird flew over their head! Baoyu Jia asked in surprise: "Where did this big bird come from?" The old boy laughed and said: "This is a flying car. We have invented flying cars in recent years. Therefore, there will be no cars on the road so that traffic accidents on the road can be avoided. This invention not only protects pedestrians but also saves a huge road repair fee since the road is not used!"

Baoyu Jia was very curious about the flying car: "How high can this car fly?" The old boy said: "The flying height is arbitrary. The car that travels a long distance flies higher, about a hundred feet off the ground. However, drivers in this category need a driver's licensed and can drive anywhere. If the car is driving in the city, it is only 50 feet off the ground. Although it can fly, the constant flashing of the car shadow is harmful to the eyes of people in the city."

Baoyu Jia saw the flying car and was shocked and happy: "I don't know whether there is a company like a Railways Administration. Is there a fixed driving schedule?" The old boy replied impatiently: "There is no such inefficient approach here. People don't have a fixed time to go out. If the driving schedule of the flying car is limited, how do you think this way can be convenient for pedestrians? Therefore, the flying car of this place can be taken at any time; the size of the flying car can be chosen at will. Baoyu Jia asked again: "How far can the flying car drive in a day?" The old boy said: "The express-flying car can drive 1,200 miles in an hour. We are now sitting on a slow-flying car, which is 800 kilometers an hour. We are a hundred miles from the Shuishih School and can be reached in about 15 minutes."

Baoyu Jia watched on the flying car through the glass window. He was ecstatic unwittingly when he saw flying cars of, different sizes in the sky. However, the old boy said: "The flying car is still in the research of improvement. After we visited the Shuishih School today, we will travel to other places tomorrow. You can take a hunting-flying car and hunt in the sky." Baoyu Jia did not expect that the people can take a flying car to hunt!

Then Baoyu Jia and the old boy got off at the front of the Shuishih School. They saw that the school had tall walls and painted walls, which were magnificent. They walked through the student house and cafeteria before they arrived at the lecture hall. Outside the lecture hall is the playground. The playground is very wide and boundless. Today's teacher is Shengwu Sun. He said to Baoyu: "This class has not yet begun. There is an auditorium in the lecture hall. You can go there to audit that class." The old boy said: "The auditorium is too close to the lecture. We have to sit far away this time. It is best to use a headphone." Therefore, Baoyu

Jia's seat was changed from the auditorium to the last class seat.

There are usually 50,000 students in this lecture hall so that there are 50,000 chairs. When Baoyu Jia entered the lecture hall, he saw a wide and deep space. Although the house is full of students, it is very quiet. Baoyu Jia put on headphones. Shengwu Sun began the lesson. He was very surprised that he really heard the voice of Sun Shengwu as if he was talking in the ear! This lesson is about the skills of offensive and defensive, which makes Baoyu be as fresh as a daisy. After this lesson, Shengwu Sun said: "We are going to the beach to practice, you can go visit together." Baoyu Jia said: "It's great, it's rare to have this opportunity. How far the beach is from here?" Shengwu Sun said: "About 50 kilometers, it will soon arrive here if you taking the flying car." Then, Baoyu Jia saw that countless flying cars were arranged there, and all the students were getting on the flying car. This car is different from the previous one. It is a convertible flying car and has railings on all sides. It can accommodate twenty or thirty people. Baoyu Jia asked: "What should I do on a rainy day?" The old boy said: "Of course, when it rains, you can raise the shed" At this time, the propeller rotates quickly and countless flying cars take off. A large group of flying cars flew east.

Although these flying cars are flying in the air, they are also lined up neatly. Baoyu Jia walked to the side of the railing and looked down to see the mountains and rivers at the bottom of the foot. Baoyu smiled and said: "Flying up to the cloudy regions in the novel seems to be just like this." The school introducer said: "The ridiculous Europeans and Americans have invented the cumbersome and dangerous balloons and bragged continuously! How do the flying up to the cloudy regions mentioned in ancient novels can compare to our flying car?"

After Baoyu Jia got off the coaster, he experienced the practice of Shuishih School on the beach and experienced the power of the "permeable mirror". They were still in Asia the day before and they were already in Africa the next day. In fact, the hunting-flying car is flying to Central Africa for hunting. Soon after, Baoyu Jia took a submarine from the Atlantic Ocean to the Pacific Ocean. He traveled around the earth for a week and he took a glimpse of the wonders of the underwater world.

1.3 Landing on the Moon After Earth Travels

In fact, the year before Woyau Wu wrote "The New Stone", in 1904, Nianci Xu had published "The Moon Colony Novel. The story originated from a murder case that occurred in the late period of the Qing Dynasty. Hunan's Menghua Long fled and succumbed to murder. On the way, with Japanese friend Yutaro Fujita, taking an air warship to circumnavigate around the earth. Finally, he landed the moon to find his wife and

children. The public transportation which Menghua Long usually take is "balloon", mentioned in "New Stone." The novelist pointed out: "When you go inside the balloon, the exquisiteness of the machine is really never seen before. In addition to the airlock, there is a living room, a physical playground, a rest of the bedrooms, and large dining rooms, you name it!" Later, Menghua Long and Yutaro Fujita discovered that the balloon driven by the Moonman was more advanced. It not only fast but also able to sail away from the gravity in the space. At the end of the story, Menghua Long moved to the moon to live, and Yutaro Fujita decided to stay on the earth to improve his "balloon".

Science fiction has always been an amazing prophecy. Since the late period of the Qing Dynasty, more than a hundred years ago, air traffic has not completely replaced the transportation system on land. The two wings of the plane are still there. However, mobile long-distance vehicles that do not have reservations in advance and are waiting in line to travel at any time seem to exist only in novels one hundred years ago. Lecture halls that can accommodate 50,000 people are also rare. The training course at the beach is like a dream. In addition, the last class was still in the urban area and the next class came to the beach. The journey to both places takes only five minutes by flying car. As for the late period of the Qing Dynasty, Menghua Long with his wife and children freely immigrated to the moon, which is as illusory as a mirage. The Chinese were afraid of the atrocities of the rulers and moved to the moon, but the Japanese chose to stay on the earth to continue his research [4]. Figure 1 show the development schedule of technologies for nearly 100 years. In fact, we observe that the novelists have mastered the pulsation of politics, technology in the past, and the national personality of different countries.

Table 1 shows the comparison of the current technology and the grand vision regarding science and technology from the dream of red chamber. Although some of the scenarios may not be realized yet (50,000 people classroom and bus without a schedule), many of the technology applications are indeed consistent with the current situation.

2 Situational Network-assisted Learning

The Dream of Red Mansions is one of the most commonly grouped as the Four Great Classic Novels. However, it is hard to understand because of various characters, the complicated clues of the story, and the abstraction of the architectural structure of the Grand View Garden, and so on. In order to enhance learning performance, Situated Learning (SL) is one of the promising methods, which significantly influencing educational thinking. In 1989, J.S. Brown, A. Collins & P. Duguid defined SL as the beginning of SL development [9]. The concept of situated learning

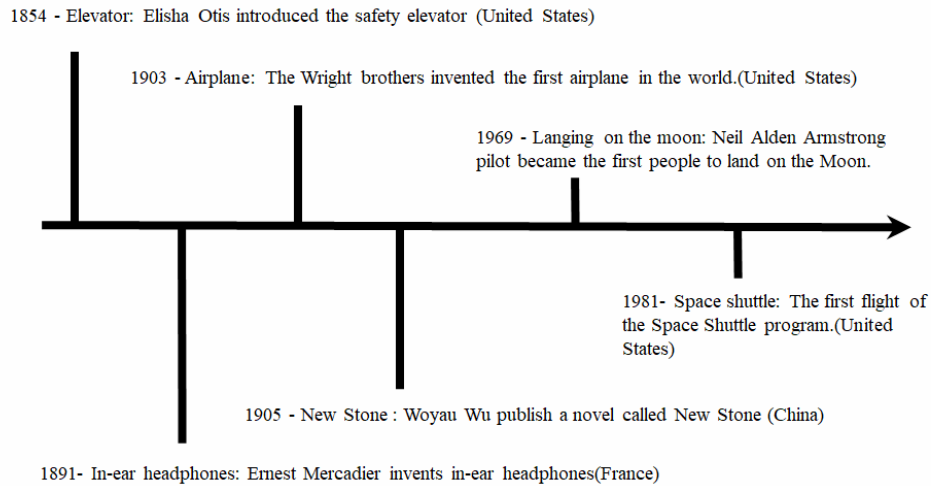


Figure 1. The development schedule of technologies for nearly 100 years

Table 1. Comparison of the grand vision regarding science and technology from the dream of red chamber and the current technology

Grand Vision regarding Science and Technology from the Dream of Red Chamber	Current corresponding technologies and products	
Flying car	Airplane [5]	Yes
Elevator	Elevator [6]	Yes
Headset	In-ear headphones [7]	Yes
50,000 people classroom		No
Bus without schedule		No
Convertible airplane		No
Balloon	Space shuttle [8]	Yes
Landing to the moon		Yes

theory is that knowledge should be delivered in an authentic context. Therefore, beginning learners should be involved in authentic settings when he/she is learning.

There are many researchers used SL to assist teaching. D. Kirk & D. Macdonald (1998) apply situated learning theory to think about the social construction of school physical education, using the example of sports education [10]. P. Cope, P. Cuthbertson, & B. Stoddart (2000) mentioned that the placement is a complex social and cognitive experience [11]. In view of the importance of the placement for training nurses, it might be beneficial when explicit use of mentoring techniques originated from situated learning and cognitive apprenticeship. J. Herrington & R. Oliver (1995) introduce the thinking on situated learning and the critical characteristics [12]. They provide specific examples to show how situated learning strategies have been applied in the development of interactive multimedia products. W. J. Clancey (1995) describes a historical perspective of situated learning and provides examples of how situated learning is being applied in the business process redesign [13]. Therefore, learning through situational experience has become an important approach for classroom teaching (Contu & Willmott, 2003 [14]).

However, some researchers think that cognitive theory and situated learning theory is conflicting. J. R. Anderson, L. M. Reder, & H. A. Simon (1996) claims that some of the educational implications that have been taken from SL are misguided [15]. Some educational opinion even comes from cognitive theory. P. Cobb & J. Bowers (1999) compares the different formulations of the relationship between theory and practice to consider the potential contribution of cognitive theory and situational learning theory between theory and practice [16].

Actually, in some case, the design of situated learning must be closely linked to situated cognition (M. F. Young, 1993) [17]. J. G. Greeno, D. R. Smith, & J. L. Moore (1995) have found that students in the “situational learning group” perform better in the near transfer than in the “traditional group” but there is no significant difference in the performance of the far transfer [18]. In other words, situational learning is helpful for near transfer, but it is still difficult for far transfer. In order to understand how situations influence the coconstruction of knowledge, S. Billett (1996) bridges of the contributions of socio-cultural and cognitive theories. He emphasized the need to find more adequate coordination between cognitive theory and social-cultural theory [19].

Situational teaching needs to make good use of

various diverse situations to excite learning. In order to increase the opportunities for learners to think and explore. Network / Internet learning is an effective solution. J. Kimball (1998) examines needs in terms of social and cognitive processes to deliver what learners

need for their professional careers. Learners themselves can explore and generate what is necessary to obtain conceptual knowledge [20]. The comparison of situational learning is shown in Table 2.

Table 2. Comparison of situational learning

Authors	Years	Methods	Contribution
<i>J.S. Brown, A. Collins & P. Duguid</i>	1989	Situated Learning	The first paper to define Situated Learning
<i>J. Herrington & R. Oliver</i>	1995	Situated Learning	Applying situated learning in the development of interactive multimedia products.
W. J. Clancey	1995	Situated Learning	Providing examples of how situated learning is being applied in the business process redesign.
<i>D. Kirk & D. Macdonald</i>	1998	Situated Learning	Authors apply situated learning theory to think about the social construction of school physical education
<i>P. Cope, P. Cuthbertson, B. Stoddart</i>	2000	Situated Learning, Cognitive apprenticeship	Appling situated learning and cognitive apprenticeship for training nurses
J. Kimball	1998	Situated Learning, Internet-assisted learning	Authors examine needs in terms of social and cognitive processes to deliver what learners need for their professional careers.

3 Participants and Experimental Procedure

Network learning shares interactive group communication characteristics in educational environment. Situational network-assisted learning provides the interactive educational environment that can make group collaboration in distinctive view of the educational course information, exchange learning experience, and assess the learning outcomes. The

courses of network-assisted learning may be comprised of exploring a similar subject matter or focus in different situation contexts or interdisciplinary studying. Through networking can break the learning gap created by the educational process, connect different fields learning and provide a new method for educational data collection and analysis to improving the teaching and research. The development model of situational network-assisted learning is shown in Figure 2.

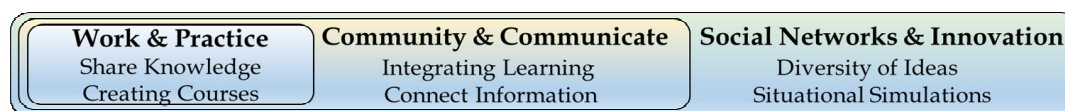


Figure 2. The development model of situational network-assisted learning

The subjects are 61 students from one class of college students and then we divide them into two groups. All of these students have not been learning these materials before. One group as the students learn the Dream of the Red Chamber with the situational network-assisted learning environment (G1) and the other group as the students the the Dream of the Red Chamber without the situational network-assisted learning environment (G2) [21-23]. The G1 group contains 31 students as the experimental group while G2 group contains 30 students as the control group. More precisely, the students are divided into control group and experimental group, and then use the pre-test, post-test, and test after review to understand the learning performance of students. As shown in Figure 3, it can easy to recognize that seven steps will be used for the experiment in this paper which are: (1) pre-test, (2) introduction to experiment and operator procedures, e.g., questions from students and answers for these

questions, (3) all the students, G1 and G2, learning by their teaching methods, (5) post-test, (6) review after fourteen days, and (7) the survey and test after review.

As shown in Figure 3, at the first steps, the students will be divided into G1 group as the experimental group and G2 group as the control group, where the students in G1 group will learn the Dream of the Red Chamber with the situational network-assisted learning environment and the students in G2 group will learn the Dream of the Red Chamber without the situational network-assisted learning environment. Also, these two groups will conduct test at the same time. At the second step, teacher will guide all the students in this experimental how to operate answer the questions from the students. At the third step, the students of G1group will learn the Dream of the Red Chamber with the situational network-assisted learning environment while the students of G2 group will learn the Dream of the Red Chamber without the situational network-

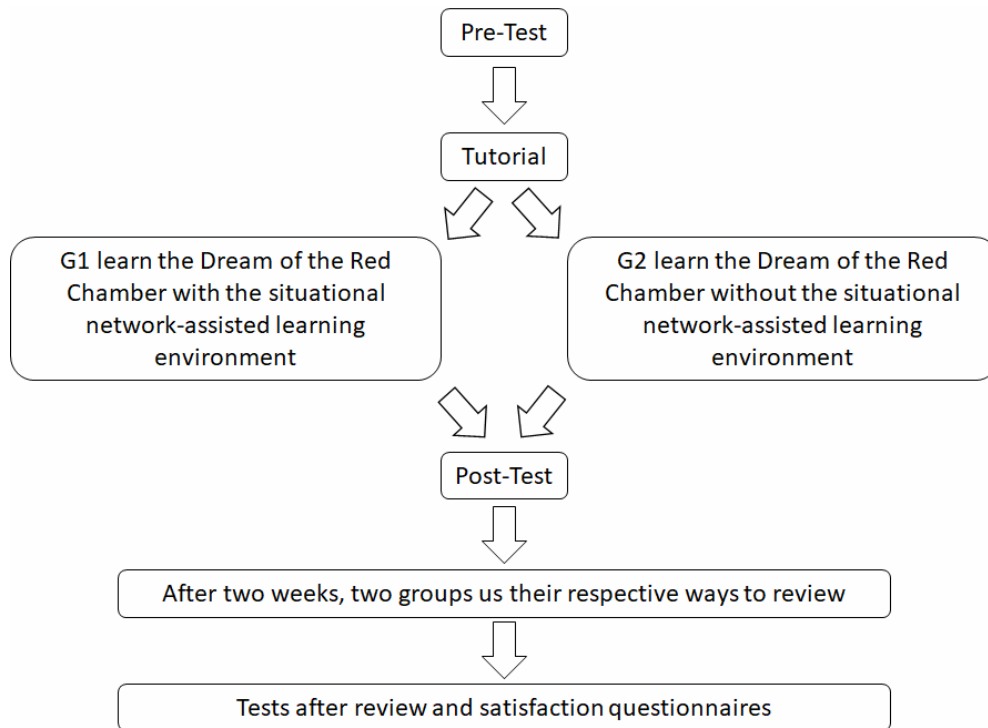


Figure 3. The design of experimental

assisted learning environment [24-25]. The time for learning is limited to 60 minutes. At the fifth step, the students of these two groups will be tested to evaluate their learning performance. At the final step, all the students of these two groups need to be tested after the review procedure, and then we can evaluate the learning performance of them. In addition, all students need to complete a satisfaction questionnaire.

4 The Satisfaction Questionnaire

The satisfaction questionnaire is attempt to know the Dream of the Red Chamber with the situational network-assisted learning environment is able to support the students understand the Dream of the Red Chamber quickly when they see the new materials at

the first time and also yield twice the result with half the effort for review the materials. That is why we design a satisfaction questionnaire for the Dream of the Red Chamber with the situational network-assisted learning environment to observe the learning situation of students [26]. This questionnaire contains fourteen items and these items can be divided into two groups: one is availability and the other one is usability which from item 1 to item 5 respectively. The Likert 5 point is also used to evaluate the result of this questionnaire from 1 (very disagree) to 5 (very disagree). Among them, the items of availability are used to observe the students to understand is it useful for their learning while the items of usability are used to know can the students easy to learn the proposed teaching method. The satisfaction questionnaire is shown in Table 3.

Table 3. The satisfaction questionnaire

Rating Items	Strongly Agree	Agree	Normal	Disagree	Strongly Disagree
(1) By using this teaching method, I can have a better understanding of the Dream of the Red Chamber.					
(2) This teaching method can help me to find my learning problems.					
(3) This teaching method can help me to understand knowledge of the Dream of the Red Chamber I learn.					
(4) Through this teaching method, I can think more extensible subjects of the Dream of the Red Chamber.					
(5) Perspective provided by this teaching method are favorable for my learning.					

4.1 Results of Learning Performance

Table 4 and Table 5 show the pre-test and post-test results of the experimental control and experimental groups. In the average score of pretest we can understand the prior knowledge of control group G2 is better than experimental group G1. But the post-test results after the experimental shown a different situation that is the average score of experimental group G1 is higher than control group G2. More precisely, the average score of experimental groups G1 is 71.54 which is higher than the average score of control group G2 60.78. These results shown that by learning the Dream of the Red Chamber with the

situational network-assisted learning environment will able to improve the learning performance significantly. The results also shown that the students (G1) learn the Dream of the Red Chamber with the situational network-assisted learning environment for the review can get higher average score than the student of G2 group who do not use the situational network-assisted learning environment, i.e., the average scores of G1 is 72.96 and G2 is 63.74. It means that if the situational network-assisted learning environment to support the student to review can significant to enhance the learning performance of students. In summary, the students can get better performance for learning and review when the traditional learning method.

Table 4. The pre-test results of the experimental control and experimental groups

Group Statistics					
Group		N	Mean	Std. Deviation	Std. Error Mean
PreTest	1	12	55.21	10.41	2.121
	2	11	56.33	5.58	1.012
PostTest	1	12	71.54	9.56	2.087
	2	11	60.78	5.97	1.126
ReveiwTest	1	12	72.96	11.74	2.103
	2	11	63.74	6.12	1.206

Table 5. The post-test results of the experimental control and experimental groups

		Lenene's Test for Equality of Vaiance		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Dofference	
								Lower		Upper
Pretest	Equal variances assumed	15.751	.000	-1.126	23	.247	-2.84	2.315	-7.952	2.012
	Equal variances not assumed			-1.127	46.875	.243	-2.84	2.297	-7.935	1.987
Posttest	Equal variances assumed	5.136	.026	3.659	23	.000	8.614	2.114	3.944	13.128
	Equal variances not assumed			3.675	51.124	.000	8.614	2.116	3.967	13.086
Reviewtest	Equal variances assumed	6.357	.012	3.187	23	.001	7.264	2.247	2.927	12.354
	Equal variances not assumed			3.192	51.977	.001	7.264	2.224	2.956	12.342

4.4 Results of the Satisfaction Questionnaire

Table 6 shows the results of the satisfaction questionnaire after the experimental that the user experience of all students for the proposed teaching method is positive. First for the availability, it can easy to understand that this study integrated the situational network-assisted learning environment to the Dream of the Red Chamber can enhance the students' learning motivation while can make the students feel the proposed teaching method can improve the learning performance much more than traditional book. Thus, the experimental group can get the average score 3.9784 which is higher than the average score of

control group 3.56.

Table 6. The results of the satisfaction questionnaire after the experimental

Group	Availability	Usability
1	Mean	3.7154
	Standard Dev.	0.28823
	Variance	0.108
2	Mean	3.9784
	Standard Dev.	0.26587
	Variance	0.079

5 Conclusion

Cross-disciplinary integration is very important for current education and technology development. This study explores the literary works in the late period of the Qing Dynasty and the development of current science and technologies. We find that many applications of science and technology have been foreseen as early as 100 years ago. It also confirms that the scholars of the late period of the Qing Dynasty actually have a very strong technological vision and literary creativity. These literary creations may directly or indirectly affect the technological development of later generations. In the future, we need to focus on the convergence of literary thought and science and technology education, and jointly develop and practice the infinite creative value of life.

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