

Fantasy-based Learning on the Web---

Tong Pak Fu and Chou Heung: the Probabilistic Fantasy

Fong-Lok Lee, Jimmy Ho-Man Lee & Tai-Shing Lau

The Chinese University of Hong Kong

Abstract:

Fantasy-based learning is a kind of situated learning paradigm in which students learn by solving problems embedded in a near-real situation. Fantasy-based learning employs further interesting story plots from fantasies and/or folklores as the background situation to motivate students to participate in learning activities. It is believed that such paradigm has on one hand, the advantages of helping students to learn in an authentic situation, and on the other, the provision of interesting story episodes as a stimulating agent for less initiated students.

This paper reports how a learning system based on a well-known Chinese folklore called “Tong Pak Fu and Chou Heung” was developed, and its effects on learning the statistics topic “probability” of 450 Hong Kong secondary school students when compared with 3 teacher-guided methods. Results show that the learning system is as effective as the other methods and that the students prefer using this system to learn. Consider that there was no guidance on the subject matters given to the students who learned through this system, while the others were guided by experienced teachers, the results were considered as an encouragement for further improvement and future developments to cover more topics.

Authors (*: contact author)

Names	Affiliation	Postal address	Email address	Phone	Fax
*Fong-Lok Lee	The Chinese University of Hong Kong	Faculty of Education, The Chinese University of Hong Kong, Shatin, N.T., Hong Kong	flee@cuhk.edu.hk	852-26096977	852-26035622
Jimmy Ho-Man Lee	The Chinese University of Hong Kong	Department of Computer Science and Engineering, The Chinese University of Hong Kong, Shatin, N.T., Hong Kong	jlee@cse.cuhk.edu.hk		
Tai-Shing Lau	The Chinese University of Hong Kong	Department of Statistics, The Chinese University of Hong Kong, Shatin, N.T., Hong Kong	tslau@sparc2.stat.cuhk.edu.hk		

Fantasy-based Learning on the Web---

Tong Pak Fu and Chou Heung: the Probabilistic Fantasy”

Web-based Learning

The WEB brings great impact to the modern society. With its large repertoire of information, and anytime and anywhere availability, the WEB is believed to be a useful tool in enhancing teaching and learning. Some educators (for example, Parker, 1997) argue that WEB-based learning will eventually lead to a paradigm shift of learning style, from teacher-centered to student-centered. The traditional role of teachers as knowledge providers will be changed to that of learning facilitators, since students can learn from the wide repertoire of information enabled by the Internet. Researchers and policy makers (see for example, Hong Kong Education and Manpower Bureau, 1998) suggest that teachers should play the role of helping students develop high-order abilities such as problem-solving and creativity rather than just delivering factual knowledge like what it used to be. Students are expected to learn through communicating, either in a real environment requiring personal contact or on the WEB, and then construct and reorganize their own knowledge. As suggested by Parker (1999), “The result of interactive learning can be new knowledge, reorganized knowledge, or simply the awareness of a need for additional understanding.” The result of such an interactive learning process will “lead to internalized, long-term understanding” (Kiesler & McGuire, 1987).

However, to change from a teacher-centred learning style to a student-centred one needs students’ active participation. Without such, they would not access the large repertoire of information even if it is conveniently available (Owston, 1997).

The vital part of future web-based learning is therefore on how to *motivate* students. The proponents of situated learning argue that learning as it normally occurs is a function of the activity, context and culture in which it occurs (i.e., it is *situated*) (Lave, 1988). The use of the Web to promote learning should therefore be done by providing a near-real situation for students to experience and then learn the related skills. However, real situations may be too complex and also not interested, at least to some students. Other researchers (Learning Technology Centre) reported that discussions among mentors and mentees can be much more fruitful when they can be anchored around a specific context such as a Jasper adventure. Such kind of anchored learning gained a lot of success in the United State, but was not so when it was moved to the East (e.g., Shyu, 2001; Lee 2000). Measures have to be taken to arouse students’ interest in participating in web-based learning.

“Tong Pak Fu and Chou Heung: the Probabilistic Fantasy”

To address the motivation problems of current web-based learning paradigm, we propose to embed all the learning activities into a famous Chinese folklore called “Tong Pak Fu’s story.” While the folklore serves to arouse students’ interest, the learning activities involve basically solving problems embedded in the situation. The paradigm is thus a kind of situation learning but with the fantasy as the added interest elements to motivate the students. The programme can be found at: <http://www.cse.cuhk.edu.hk/~mhp/all.html>.

Tong Pak Fu was a legendary poet, scholar, painter and womanizer of his time in the Ming Dynasty. His work was praised by all and still remains a crucial part of Chinese literature. His tales have provided inspiration for numerous Chinese folklores, the most well-known of which is the Tong Pak Fu and Chou Heung love story. Rumored to have eight wives, Tong Pak Fu could not resist the electrified pulse induced by the first sight of Chou Heung in the busy market square. After his unsuccessful flirting attempt with Chou in the temple, Tong paved his way into the Wah Mansion where Chou was a maid. Although Tong managed to win the heart of Chou eventually, Mrs. Wah decided to give Tong the ultimate test, in which Tong has to pick Chou Heung from a group of brides with their faces masked.

This famous folklore appeared in books and movies. It is believed that students will be motivated to solve the problems embedded in the story by playing the role of Tong Pak Fu and going through a similar love chase for Chou Heung.

The Learning System

The story is now rewritten and divided into 5 scenes representing the different stages of the courtship of Tong Pak Fu towards Chou Heung. Each scene contains one problem for students to solve in order to understand a particular concept. Each such problem is also divided into several smaller problems which are expected to be solved by the students independently, or with the help of an wise genie. By playing the role of Tong Pak Fu to court his beloved lady Chou Heung, students have to experience the different scenes and solve the problems there. The fantasy-based learning environment is therefore a role-playing problem-based learning paradigm with students motivated by fantasies.

The Evaluation

To evaluate whether this system can help students to learn better than other

approaches, namely, the traditional lecturing approach, the problem-based approach in the classroom with story background, and the problem-based approach in the classroom without story background. A total of 450 students were invited to participate in a one-day activity within the university's campus. In order to attract participants, the activity day was so designed with activities such as laboratory visit and sight-seeing in addition to the learning sessions.

Research Design

There were 2 learning sessions, one in the morning in which students learned the first 3 scenes, and the other one in the afternoon, in which the students learned the other 2 scenes. The participants were divided into 4 groups, one for each of the 4 approaches, namely, the traditional lecturing approach (LECT), the problem-based approach in the classroom with story background (PBLS), the problem-based approach in the classroom without story background (PBL), and the Web-based problem-based approach in the classroom with story background (WBL). The last one represents the fantasy-based approach the present study aims to test.

The aim of the evaluation is to compare the learning effects of the fantasy-based approach against the other 3. The Web-based approach was done without the presence of teachers, while the other three were conducted by 3 experienced teachers. In order that the teacher effect is minimized, the experiment was done in 3 consecutive rounds, and each teacher was assigned to teach with a different method. The research design can be summarized in Table 1.

Table 1: Treatment and Teacher Allocation Table

Teaching Methods	Week 1		Week 2		Week 3	
	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
WBL	G111	G111	G211	G211	G311	G311
	G112	G122	G212	G222	G312	G322
	G113	G132	G213	G232	G313	G332
	G114	G142	G214	G242	G314	G342
PBLS	G121	G121	G221	G221	G321	G321
	G122	G112	G222	G212	G322	G312
PBL	G131	G131	G231	G231	G331	G331
	G132	G113	G232	G213	G332	G313
LECT	G141	G141	G241	G241	G341	G341
	G142	G114	G242	G214	G342	G314

* G_{ijk} : Group of students at i^{th} day, method j in the morning, and subgroup k

Variables

Two instruments were separately developed to measure the students' academic achievement and their perception of the Web-based learning system as compared with the others. The academic achievement is measured by a written test on how well they learned the topic Probability, while the students' perception was measured by how they think about the Web-based learning system: whether it is boring, challenging, confidence and stimulating.

Results

Data collected shows the following findings:

On the academic achievement, no statistical significant difference was found between WBL and any one of the three other methods (all three p -values are larger than 0.6), which indicates students using WBL can learn as well as all the other methods which were conducted by experienced teachers.

On the students' perception, the following results were found:

1. Compared with WBL, all the other methods PBL, LECT, and PBLs were reported to be more boring with p -values of .043, .013, 0.248 respectively.
2. WBL was considered more challenging than all the 3 other methods with p -values 0.004, 0.002, 0.001 when compared with PBL, PBLs and LECT respectively.
3. Students thought that the WBL learning method gave them more confidence in studying with p -values 0.000, 0.001, 0.000 when compared with PBL, PBLs and LECT respectively.
4. Students perceived that the WBL learning method was more stimulating than the LECT teaching method (p -value=0.006). When comparing WBL with the PBL and PBLs, the p -values were 0.058, 0.069 respectively, and are much higher than that between WBL and LECT. It seems that Problem-based learning were considered as stimulating, although Problem-based learning on the Web is more stimulating.

We compared also some other aspects such as whether the method would increase students' interest in the subject, whether the students can understand the subject more easily, *etc.* They do not demonstrate any significant difference.

Conclusion and Discussion

Results show that the learning effect of using our Web-based learning system is at least as good as that obtained by experienced teachers. This is encouraging, since a teacherless method can now achieve the same effectiveness as those conducted by experienced teachers. Furthermore, this Fantasy-based learning system was considered by the students as less boring, more challenging, and more stimulating, and at the same time giving them more confidence. All these are important factors in motivating students to learn. Although for the time being, the advantage of using the Fantasy-based learning system is not so obvious, it is believed that, if students' interest persists, and with the improvement of the system, Fantasy-based learning system can be an important learning tool in the near future.

References:

- Hong Kong Education and Manpower Bureau (1998). *Information technology for learning in a new era: Five-year strategy 1998-99 to 2002-03*. Hong Kong Government.
- Kiesler, J., & McGuire, H. (1987). Aspects of computer-mediated communication. *International Psychologist*, 32(10), 45-67.
- Lave, J. (1988). *Cognition in Practice: Mind, mathematics, and culture in everyday life*. Cambridge, UK: Cambridge University Press.
- Lee, F. L. (2000). Anchored situated learning in primary mathematics. Unpublished Document. Hong Kong: The Chinese University of Hong Kong.
- Learning Technology Centre, Peabody College of Education, Vanderbilt University. <http://peabody.vanderbilt.edu/ctrs/ltc/Research/jasper.html> .
- Owston, R. D. (1997), The World Wide WEB: A technology to enhance teaching and learning? *Educational Researcher*, 26(2), 27-33.
- Parker, A. (1997). A distance education how-to manual: Recommendations from the field. *Educational Technology Review*, 8, 7-10.
- Parker, A. (1999). Interaction in distance education: The critical conversation. *Educational Technology Review*, 12, 13-17.
- Shyu, H. (2000). Using Video-Based Anchored Instruction to Enhance Learning: Taiwan's Experience. *British Journal of Educational Technology* , 31(1) , 57-69.