

Characteristics of on-line learning behaviour in distance education

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ABSTRACT: Limitations of the existing research by Chinese scholars on on-line learning behaviour can be summarised as: most of the existing research is aimed at students of ordinary universities instead of distance learners from the Open University and colleges of on-line education; and the existing research addresses all the learning behaviour generated on-line instead of the learning behaviour captured by a specific distance learning platform. To fill in the existing gap, a statistical analysis was performed of the on-line learning behaviour of research subjects in the National Open University, provincial TV university and state TV university in China, which involves a specific three-level distance learning support platform. The results show that the on-line learning behaviour of distance learners has characteristics of habituation and adaptation without the characteristic of asynchronous interaction.

INTRODUCTION

Learning behaviour is one aspect of learning theory. In recent years, along with the development of cognitive learning theory, research on learning behaviour gradually has become a trend in research on educational psychology.

In the book *Experience and Education*, John Dewey stresses that instead of an acquired achievement, learning itself is a kind of course; a learner will demonstrate learning behaviour by interactive activities with the environment [1]. The American scholar, Arthur L. Wilson, deems that learning behaviour is an interaction of the learning subject with the surrounding social environment [2].

Yang Kaicheng, a Chinese scholar, deems that learning behaviour is the sum of activities done by the learner, with the motive of acquiring a certain learning result [3]. At present, there is no acknowledged common understanding of the concept of on-line learning behaviour, in China or overseas [4][5].

There are well-known concepts for on-line learning behaviour, such as *distance learning behaviour* and *on-line independent learning behaviour* [6]. Peng and Yang deem that on-line learning behaviour is a distance learning behaviour developed by a learner in a learning environment created by modern information technology and with new communication mechanisms, as well as rich resources. It has multiple dimensions, such as information and searching, processing, publishing, interpersonal communication and question resolution [4].

From the above, it can be seen that research on the on-line learning behaviour of a learner with a certain distance learning platform can be undertaken from multiple angles, such as visiting, posting, communicating and depth of study.

RESEARCH OF ON-LINE LEARNING BEHAVIOUR

Investigation of On-line Learning Behaviour

Investigated subjects of on-line learning behaviour consist of two categories; namely, college students and in-service distance learners. The investigations are divided into two categories, as well. In aiming at college students of different majors from different colleges, Xu, amongst others, investigated the current status of on-line learning behaviour of college students and discussed the major factors influencing their on-line learning behaviour [7-11].

Peng and Yang investigated and analysed the learning behaviour rules for on-line distance learners [12]. Hu and Liu analysed the questions raised by modern distance education on learning behaviour [13]. Zeng and Yuan proposed

round-the-clock learning support services for on-line distance learners [14]. Xia analysed the behaviour of tutors and learners to help tutors grasp the full picture of a learner's development on an on-line course [15].

Characteristics of On-line Learning Behaviour

Chinese scholar Chen Li and her team proposed a teaching interaction model for distance learning and researched the asynchronous interaction behaviour and characteristics of distance learners [16-18]. Cao and Zhong analysed the behavioural characteristics of on-line learners [19].

Relationship between On-line Learning and Learning Effectiveness

Hong and Liu analysed and discussed the relationship between English learning behaviour and English learning effectiveness of the freshman [20]. Lv and Yi researched the influence of college students' on-line learning behaviour on their academic record and mental health, and concluded that college students' on-line learning behaviour goes hand in hand with their academic record and mental health [21].

On-line Learning Behaviour Models

Peng and Yang proposed a multi-dimensional, multilevel model of on-line learning behaviour, and an analysis system for learning behaviour [4]. Taking the theory of planned behaviour as a guide, Li and Yan built an on-line learning behaviour model of college students and analysed the characteristics of college students' on-line learning behaviour [6]. Based on TRA (theory of reasoned action) and TAM (technology acceptance model), Zhou built an on-line learning behaviour model of college students [22].

Monitoring and Assessment of On-line Learning Behaviour

Based on an on-line learning behaviour data model, Yang and Hong monitored, in real-time, on-line learning behaviour [23]. In aiming at the characteristics of students' behaviour during network and multi-media teaching, Jiang and Zhao designed an intelligent assessment model to assess students' behaviour under a new type of teaching model and verified the model's feasibility [24].

LIMITATIONS OF EXISTING RESEARCH

From the above references, it can be seen that on-line learning behaviour has been investigated from various angles, and this has played a positive role in the development of on-line education in China. However, when getting down into the details, there are obvious limitations to the existing research.

First, instead of the distance learners being from the Open University or colleges of on-line education, most of the existing research is aimed at college students from ordinary universities. There is a big difference between the on-line learning behaviour of college students from ordinary universities and the distance learner. Ordinary college students' learning is mainly through contact with teachers and tutors. On-line learning augments only the course taught in a classroom. However, distance learners mainly learn through the on-line learning platform [25]. Distance learners from the Open University and colleges of on-line education are the biggest component of on-line learning. Therefore, research on the on-line learning behaviour in distance education is necessary.

Second, on-line learning behaviour in the existing research is very broadly defined and not specific to a particular distance learning platform. It is all the learning behaviour generated on-line during learning. On-line learning behaviour of the distance open education learner is with the distance learning support platforms of the Open University, as well as radio and television universities. These platforms are built with abundant investment of financial, manpower and material resources. Whether the distance open education learning support platform can support the learning of the learners, is a question that can be answered by research on the on-line learning behaviour of distance learners using these platforms. Based on the above, research was carried out on the on-line learning behaviour of distance education on the distance learning support platform to identify on-line learning behaviour characteristics.

ON-LINE LEARNING BEHAVIOUR CHARACTERISTICS OF DISTANCE LEARNERS

Research Subjects

This study referred to in this article used a state TV university in China's west, here referred to as the experimental college. This experimental college started distance open education in 1999. The learning of the learners in the experimental college was investigated. The number of students recruited in 2013 was 3,008; in 2014 there were 3,362 students; and in 2015, there were 4,099, for a total of 10,469 registered distance learners who were the research subjects. Learners from the National Open University and provincial TV university were also subjects in the extensive study, however, the results referring to this group of subjects are not included in this article.

Research Content

The SPSS (statistical package for the social sciences) version 17.0 was used as the research tool. A statistical analysis was performed on the on-line learning behaviour of the research subjects. The teaching uses a three-level distance learning support platform. On-line learning behaviour measured include the number of logins, learning time, quantity of major postings, number of post replies and page views.

Results Analysis

The SPSS was applied to the data from the on-line learning of the experimental objects using the three-level distance learning support platform. The results are presented in Table 1.

Table 1: On-line learning by date of attendance and grade.

Date of attendance	Grade	Average learning time per year (minute)	Average number of logins	Average learning time per session (minutes)	Average number of major postings	Average number of post replies	Average page views on each post
2013	I	1,221.60	19.48	62.73	1.37	0.13	6.17
2013	II	1,742.31	27.89	62.46	1.43	0.12	2.04
2013	III	951.37	18.06	52.67	1.18	0.04	0.79
2014	I	4,072.67	59.72	68.20	4.71	0.36	7.82
2014	II	5,299.74	99.11	53.48	3.24	0.19	3.13
2015	III	5,629.35	122.97	45.78	3.87	0.38	5.06
Average		3,152.84	57.87	57.55	2.63	0.20	4.14

Note: Data are from the experimental college

From the statistics data in Table 1, it can be seen that the average annual on-line learning time of the experimental learners was 3,152.84 minutes per year; average annual number of logins was 57.87; there were 57.55 minutes per session; average posting quantity was 2.63 per year; average post replies was 0.20 per year; and the average page views on each session was 4.14.

- On-line learning habits of distance learners:

The social learning theory of Bandura stresses that the behaviour of human beings is influenced not only by external factors, but also by individual self-adjustment [26]. This viewpoint points to the influence on learning of learning habits [27]. Shen deems that learning habits are the stable way of learning formed by the learner during the learning process [28]. Chen and Ren deem that distance learning involves the time and place the learner selects to learn, the length of time spent learning each week, the organisation of course learning materials and other matters [29]. In this research, the metrics to measure on-line learning habits are the learning time, which is measured as number of logins and weekly learning time.

From the data collected for this study, it was found that learning was generally concentrated in May, June, November and December. The main concentration is from half way through the semester to the examinations at the end. Besides preparing for the examination, a mid-semester teaching inspection is a significant factor influencing learners.

Statistical results in Table I show that the average on-line learning time per session for learners was 58 minutes and varied from 46 to 68 minutes. Therefore, the on-line learning time was within the 50-60 minutes of a traditional class. It is apparent that some learners' learning habits are influenced deeply by traditional classroom teaching. Although the learning is independent, learning behaviour is influenced by previous learning habits.

Research by Chen and Ren on distance learners of the Open University of Hong Kong shows that weekly learning time for the majority of distance learners is not more than five hours, which is shorter than the 15-20 hours per week recommended by colleges [29]. Statistical data in Table 1 show that the annual average on-line learning time of learners in the experimental college was 3,152.84 minutes. Averaged over eight months yields an average weekly learning time in the experimental college of about three hours, which is close to the result for the Open University in Hong Kong.

These numbers do not by themselves say whether the learner's on-line learning is enough, and whether the learner can achieve the learning requirements. A deep analysis is needed, as well. A simple calculation allows a comparison to be made. The lowest total credit is 76 for college graduation and 71 for a Bachelor's degree by distance open education. Based on the lowest average credits, 73.5 credits are needed for college graduation and a Bachelor's degree. The thesis and social practice account for 60 credits averaged over three years; that is to say, 20 credits per year.

From the data in Table 1, the average on-line learning time was 3,153.84 minutes per year. Taking 50 minutes per classroom as standard, the learners in the experimental college took the equivalent of 63 classes per year, which was far below the corresponding 16-18 hours each credit point in an ordinary university. From the data in Table 1, the average value every year was about 58 times, averaged to 20 scores; hence, the average on-line learning time per score was about three, which is very small. From these data, the learning time of distance open educational learners in the experimental college was found to be insufficient.

- On-line learning adaptability:

Adaptive learning theory considers learning a process of interactive activities to acquire knowledge or augment knowledge and experience. Learning adaptability is an aptitude in which learners consciously adjust their mental state to the learning environment [30]. Therefore, on-line learning adaptability is a dynamic process in which learners adapt to the on-line learning environment [31]. In this research, the on-line learning adaptability of distance learners is their adaptation to the three-level distance learning support platform. This was measured by on-line learning times and postings. On-line learning times imply the learning aspiration of learners; length of learning time embodies the interactive aspect of the learning process.

The on-line learning behaviour of distance learners can be analysed to determine if they adapt to on-line learning or not. Investigation and a thesis are in grade III, which make those data difficult to compare with the other grades; therefore, grade III is not considered. From Table 1, for grades I and II, the average learning times of learners increase year by year. That is to say, the aspiration of learners in the experimental college increases year by year. But, the asynchronous interactions reduce, as revealed by the postings. Thus, it can be seen that, for on-line learning, there is a common adaptive process for learners. By grade II, learners have adapted to on-line learning, but not to asynchronous interactions.

- Asynchronous interaction of on-line learners:

Piaget claims that instead of a passive process, learning is a positive and active process; this construction process is produced and completed in the interaction between the learner and the environment, which is a precondition for learning [32]. Chen deems that interaction with learning resources can arise as part of the interaction with students [33]. The *forum* is the major asynchronous interaction tool on the support platform for distance open education. The quantity of major postings and replies, as well as page views, can reflect the asynchronous interaction of the learners.

Many scholars in China and overseas divide the roles of distance learners in an on-line community, into various types. Shafer divided the members of a discussion group into core members, general participants and observers, according to their participation activity, and the ratios of these three categories is about 1:10:100, respectively [34]. Taylor divided the learners in the learning community into participants, observers and escapees, and said that the ratios were 1:1:1 [35]. In this research, learners are divided into active participants, general participants and observers, following the general approach of the above scholars. Quantities of major postings and replies, and page views of the learners, serve as metrics. Active participants are those who are actively involved in major postings and replying to posts, while observers only view the posts without any distance interaction.

The ratios for the three roles of active participant, general participant and observer were 1:13:21, respectively. This shows that the *observer* percentage of the learners in the experimental college was high, with only a small percentage of active participants in the on-line community.

From Table 1, it can be seen that on the three indices of quantity of major postings, quantity of post replies and page views per post, learners gradually reduce the use of postings. This shows that asynchronous interaction in distance education on-line learning behaviour in the experimental college was not strong.

CONCLUSIONS

On-line learning of distance education learners has the characteristics of habituation and adaptation, without the characteristic of asynchronous interaction. On-line learning behaviour in distance education is affected by the previous learning experience; namely, there is habituation, and there is an adaptive phase for the distance learners' on-line learning, which is usually within one year.

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