

Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

Computers & Education

journal homepage: www.elsevier.com/locate/compedu

Interaction of problem-based gaming and learning anxiety in language students' English listening performance and progressive behavioral patterns

Gwo-Jen Hwang^{a,*}, Ting-Chia Hsu^b, Chiu-Lin Lai^a, Ching-Jung Hsueh^a^a Graduate Institute of Digital Learning and Education, National Taiwan University of Science and Technology, 43, Sec. 4, Keelung Rd., Taipei, 106, Taiwan^b Department of Technology Application and Human Resource Development, National Taiwan Normal University, Taiwan

ARTICLE INFO

Article history:

Received 4 June 2016

Received in revised form 23 November 2016

Accepted 27 November 2016

Available online 29 November 2016

Keywords:

Teaching/learning strategies

Elementary education

Applications in subject areas

Interactive learning environments

ABSTRACT

Scholars have indicated the importance of considering anxiety in language learning. They have also pointed out the potential of integrating learning content into gaming contexts. However, few have explored in-depth the learning processes in game-based learning environments while also taking students' learning anxiety into account. To address this issue, a problem-based English listening game was developed, and 77 ninth graders took part in the study by playing the game. A quasi-experiment was conducted to evaluate students' learning achievement, learning motivation and English anxiety. In addition, progressive sequential analysis was employed to explore the learning behavioral patterns of students with different levels of English anxiety. According to the three learning phases, it was found that the gaming approach benefited the students' learning achievement and motivation. Moreover, the students with higher levels of English anxiety progressively performed more complex learning and gaming behaviors in the gaming context, and had better learning achievement than those with lower levels of anxiety.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

In recent years, the relationship between students' affect and their learning performance has been considered as an important issue in education (Cheng, Su, Huang, & Chen, 2014; Verkijika & De Wet, 2015). Several studies have reported that students' affect is associated with their cognitive learning (Konak, Clark, & Nasereddin, 2014; Valentín et al., 2013). Moreover, positive affect, such as learning motivation and satisfaction, can encourage students' engagement in learning (Cheng et al., 2014; Wong, Chai, Aw, & King, 2015), while negative affect, such as learning anxiety and distraction, could lead to poor learning outcomes, in particular in language learning which requires frequent practice in relevant contexts (Kim & Glassman, 2013; Teo, Tan, Yan, Teo, & Yeo, 2014).

* Corresponding author.

E-mail addresses: gjhwang.academic@gmail.com (G.-J. Hwang), ckhsu@ntnu.edu.tw (T.-C. Hsu), jolen761002@gmail.com (C.-L. Lai), cqlalala55@gmail.com (C.-J. Hsueh).

It is recognized that learning a foreign language is strongly associated with students' learning motivation and their foreign language anxiety (Ping, Baranovich, Manuelli, & Siraj, 2015; Tum, 2015). MacIntyre and Gardner (1994) defined foreign language anxiety as a feeling of worry, nervousness, and apprehension when learning a foreign language. Previous researchers have indicated that foreign language anxiety can be a determinant of students' foreign language learning achievement (Papi, 2010; Yan & Horwitz, 2008). For instance, Khajavy, Ghonsooly, Fatemi, and Choi (2016) examined Iranian students' willingness to communicate in English, and found that the students' perceived competence of English and their English anxiety directly affected their willingness to communicate in English. On the other hand, Denies, Janssen, and Yashima (2015) also proved that their level of foreign language anxiety plays an important role in students' communication in foreign languages.

Consequently, an increasing number of researchers have attempted to reduce students' anxiety while learning English by integrating several learning strategies and technologies, especially employing game-based learning approaches (Reinders & Wattana, 2014; Verkijika & De Wet, 2015). Some researchers have found the game-based learning strategy to be a favorable learning approach for reducing students' learning anxiety because of the enjoyment, interactivity, and dynamic nature of the games (Huang, Huang, & Wu, 2014). For instance, Young and Wang developed the Game Embedded CALL (GeCALL) system for students' English pronunciation practice. The results revealed that this learning approach can reduce students' English speaking anxiety and provide them with more opportunities to do speaking practice.

Although many studies have discussed the treatment of game-based learning for students' English anxiety, few have explored the relationship between students' actual learning behaviors and their English learning anxiety. Since the analysis of learning behaviors has been considered as an approach to understanding more precisely how students behave (Cheng & Tsai, 2016), it would be better that researchers explore students' learning behaviors and clarify the different learning behaviors of students with varying levels of learning performance (Hou, 2012; Lai & Hwang, 2015). In order to explore the role of English anxiety and game-based learning strategies in students' English learning, in this study we developed a problem-based English listening game to help students with their English learning. Moreover, analysis of the students' progressive behavioral learning patterns was employed to probe their learning behaviors in each gaming phase. Finally, an exploration of the students' progressive behavioral learning patterns according to the level of their English anxiety was conducted.

2. Literature review

2.1. Issues related to English anxiety

The issue of performance associated with anxiety in English learning has been documented, and researchers have found that most students who are weak in English have difficulty speaking and discriminating the sounds and structures of a target language message (Yan & Horwitz, 2008). English anxiety has been conceived as "the feeling of tension and apprehension specifically associated with second language contexts, including speaking, listening, and learning" (MacIntyre & Gardner, 1994). Generally, students tend to give up practicing English and lose confidence when they experience higher English anxiety. For instance, anxious students may exhibit avoidance behaviors, have difficulty learning vocabulary by heart, and have negative attitudes towards answering questions in class (Papi, 2010).

Previous findings (Alipanahi & Mahmoodi, 2015; Lin, Chao, & Huang, 2015) have clearly indicated a negative relationship between English anxiety and English performance. When students' English anxiety increases, their English learning performance decreases. A number of studies have sought and clarified determinants associated with English anxiety (Khajavy et al., 2016; Tum, 2015). For instance, Zhang (2013) examined the relationship between students' English listening anxiety and their English listening performance, and found that the students' English listening anxiety could affect their English listening performance. Khodadady and Khajavy (2013) further indicated that external motivation and being less self-determined are positively related to students' English anxiety. In addition, Peng (2015) suggested several factors associated with students' English anxiety, including English-specific images of their desired future, the English-specific attributes that they believe they ought to possess, and their previous experience of learning English.

According to the literature, it was concluded that English anxiety would affect non-native students' behaviors and English learning performance (Yen, Hou, & Chang, 2015). For instance, in Taiwan, English is regarded as an important language and a necessary competence. However, students face some challenges such as lacking a practical environment for practicing and applying English, limited learning time in school, and being passive when it comes to speaking English openly around others because they are afraid of being despised (Yang & Chang, 2008). Therefore, the issues of reducing students' English anxiety and decreasing teachers' difficulties in teaching English have become important in Taiwan (Young & Wang, 2014).

2.2. Related computer-assisted English learning

Studies focused on integrating new strategies and technologies into learning have been fruitful in the past decades (Clark & Mayer, 2012, pp. 368–398; Kozma, 1991). Various educational applications have been developed and employed in regular English learning courses. For instance, Hsu (2015) developed a video-based English learning system, and provided students with adaptive assistance based on students' learning needs. The results indicated that the students who learned with this approach practiced English more; moreover, their intrinsic motivation also improved more than that of those who learned with conventional video watching. Another example is Yang, Gamble, Hung, and Lin's (2014) investigation of the effectiveness of adaptive English literacy instruction for students' acquisition of critical thinking skills and English literacy. The findings of

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات