Liu, C.-C. et al. (Eds.) (2014). Proceedings of the 22nd International Conference on Computers in Education. Japan: Asia-Pacific Society for Computers in Education

The motivational underpinnings of using wikis for collaborative group work

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Abstract: This study aims to investigate the role of goal orientations on students' engagement in using wikis for collaborative writing. Hong Kong secondary school students (N = 422) participated in the study and answered questionnaires about their goal orientations and their level of engagement when using wikis for collaborative project work. Results showed that students who pursued mastery and social goals were more engaged in their collaborative projects. However, it was students who pursued performance goals who achieved higher grades. Implications for synergizing research on IT in education and motivational psychology are discussed.

Keywords: achievement goals, social goals, wiki, collaborative group work

1. Introduction

In recent years, there has been rapid growth in the use of Web 2.0 tools (also known as Web-based collaboration ware) such as wikis, blogs, podcasts, and RSS feeds (Boulos, Maramba, & Wheeler, 2006; Byron, 2005; Ebner, Kickmeier-Rust, & Holzinger, 2008). The success of Wikipedia is a testament to the widespread dissemination of Web 2.0 technology. Web 2.0 technologies offer a wide range of unique and powerful information sharing and collaboration features.

Educators have begun to harness the potential of Web 2.0 in the school setting (Chu, Chan, & Tiwari, 2012; Fu, Chu, & Kang, 2013; Parker & Chao, 2007; Woo & Chu, 2013). In this paper, we particularly focus on the use of wikis to foster collaborative group work. The word "wiki" comes from the Hawaiian phrase "wiki-wiki" which means quick. It is a system that allows users to create and edit web pages collaboratively (Leuf & Cunningham, 2001). Much of the research on wikis have been conducted by learning technology specialists who were interested in harnessing the affordances of the wiki technology in enhancing the student learning experience (e.g., Chen et al., 2005; Pifarre & Staarman, 2011). As such, these studies have usually focused on the technical features of wikis, and how students and teachers use these features in collaborative group work.

A shortcoming of this literature is a lack of attention to the deeper motivational processes that underpin the effective use of the wiki technology for collaborative group work. Different students facing the same wiki tool would exhibit varying degrees of motivation and engagement. Given that all students are exposed to a similar wiki platform why do some students display a greater degree of engagement, while others seem to be more indifferent. What could account for these individual differences in motivation and engagement?

In this paper, we attempt to answer this question by looking at how individual differences in student motivation could account for the differential engagement with the wiki for collaborative learning. Educational psychologists who have studied motivation usually focus on the role of goal orientations as crucial motivational constructs (Covington, 2000). Therefore, in this paper, we examine the role of goals in predicting engagement and achievement when using wiki for collaborative learning.

2. Literature Review

Educational psychologists who study motivation have usually focused on the role of goals on learning and achievement. Goals refer to desired end states and have been shown to predict a wide range of educational outcomes (Huang, 2012; Hulleman, Schrager, Bodmann, & Harackiewicz, 2010).

Early research has focused on two types of achievement goals: mastery and performance goals (Elliot, 1999). Students who endorse mastery goals focus on improving their level of competence and are intrinsically interested in the task. On the other hand, students with performance goals are interested in demonstrating their superiority to others and showing their normative competence. Mastery goals have been shown to be associated with deep learning strategies, intrinsic motivation, effort, persistence among others.

Later researchers have argued that social goals are also important predictors of learning and achievement (King & McInerney, 2014; King, McInerney, & Watkins, 2012, 2013; King & Watkins, 2012). Social goals refer to the pursuit of social outcomes in school (Wentzel, 1994, 1996). There are two main types of social goals: prosocial and social responsibility goals. Students with prosocial goals focus on trying to help their classmates and peers. They are keen to share what they know with others. Students with social responsibility goals are focused on keeping interpersonal commitments to their peers and complying with classroom norms. Research has shown that both prosocial and social responsibility goals were associated with a wide range of adaptive educational outcomes (Wentzel, 1996; 2000).

In this study, we examined the association between the different types of goals that students pursued and their level of engagement in the collaborative wiki group work. Engagement has usually been conceptualized as having three dimensions: behavioral, emotional, and cognitive (Fredricks, Blumenfeld, & Alison, 2004). Behavioral engagement refers to effort, persistence and mental effort such as attention and contribution to class discussion. Emotional engagement covers the energized emotional states such as enthusiasm and interest, while cognitive engagement refers to the use of deeper forms of learning strategies. Cognitively engaged students are not afraid to exert effort to master difficult skills.

Engagement is a crucial construct in student learning given that engaged students learn more in school and achieve higher grades. They are also less likely to drop out of school. Engagement is a malleable construct and has been shown to be influenced by a wide range of factors. The goals that students pursue have been shown to exert an important impact on students' levels of engagement. In particular, mastery goals have been shown to be positive predictors of engagement.

Research examining the link between social goals (prosocial and social responsibility) and engagement are more sparse. However, the few existing studies would suggest a positive linkage between social goals and engagement. Studies have shown that students who try to help their peers (i.e., those who pursue prosocial goals) learn more in the process. Those who try to comply with classroom norms and rules are more likely to have a better overall learning experience (Wentzel, 2000; Wentzel, Filisetti, & Looney, 2007)

The present study examined the relationship between different types of goals (mastery, performance, prosocial, and social responsibility goals) and engagement in collaborative wiki writing. In this study we focused on a group of students who were using wikis to co-create their final group project.

3. Methods

Procedures

The wiki platform PBworks (http://www.pbworks.com) was used in this study. Students used this platform for their collaborative inquiry group project in Liberal Studies (LS). A standard PBworks template was created. Using this template, students could add or edit the files and pages. On each page, they could leave comments for internal group discussions. The widget "Recent Activity History" could help group members keep track of the changes on the wiki pages.

On average, each group had four students. The students took 4-5 months to complete the online project. At the end of the project, students responded to a questionnaire which measured their goal orientations and engagement. The final grades for the group work was also obtained.

Participants

There were 422 secondary school students from Hong Kong who participated in the study. All students were from a co-education government secondary school, and their age ranged from 13 to 15.

Instruments

To measure students' goal orientations, the goal questionnaire devised by Wentzel (1994, 1996, 2000) was used. It measures four types of goals: mastery, performance, prosocial, and social responsibility goals. The definitions of these constructs as well as sample items are given below. Note that all questions were modified to pertain to the LS class.

To measure cognitive engagement, we used the deep learning strategies subscale of the Revised Two Factor Study Process Questionnaire (Biggs, Kember, & Leung, 2001). To measure behavioral and emotional engagement, we used the relevant subscales from Skinner, Kindermann, and Furrer's (2009) Engagement and Disaffection Questionnaire. All these scales were modified to pertain to the liberal studies class which was the domain we chose to study in this paper. Questionnaires were answered on a 5-point Likert scale with higher scores indicating a greater endorsement of the construct.

Table 1: Goal constructs, definition, and sample items.

Goal construct	Definition	Sample items
Mastery goal	Wanting to learn as much as possible for intrinsic reasons	How often do you try to learn something new for LS class even if you don't have to?
Performance goal	Wanting to outperform others	How often do you try to show you have learned more than your classmates in LS class?
Prosocial goal	Wanting to help classmates and peers	How often do you try to share what you've learned with your classmates in LS class?
Social responsibility goal	Wanting to keep interpersonal commitments to peers and teachers	How often do you try to do what your LS teacher tells you to do?

4. Results

Preliminary results

We first looked at the descriptive statistics and internal consistency reliabilities. Results showed that all the scales had good psychometric properties with Cronbach's alpha reliabilities ranging from .74 to .84 (see Table 2). Table 3 shows the correlations among the variables.

Table 2: Descriptive statistics and internal consistency reliabilities

	Mean	SD	Cronbach's alpha
Mastery goal	3.36	.66	.83
Performance goal	3.10	.72	.83
Prosocial goal	3.21	.62	.79
Social responsibility goal	3.47	.64	.74
Behavioral engagement	3.62	.58	.82
Emotional engagement	3.59	.58	.84
Cognitive engagement	3.37	.59	.79
Grades	3.09	.72	n/a

Table 3: Zero-order correlations among the variables.

	2	3	4	5	6	7	8	
1. Mastery goal	.650***	.610***	.606***	.513***	.535***	.543***		.235***
2. Performance goal	1	.598***	.479***	.341***	.338***	.424***		.272***
3. Prosocial goal		1	.487***	.357***	.431***	.442***		.175***
4. Social responsibility goal			1	.463***	.442***	.455***		.191***
5. Behavioral engagement				1	.791***	.707***		.218***
6. Emotional engagement					1	.755***		.214***
7. Cognitive engagement						1		.180***
8. Grades								1

Note:***$p < .001$.

Predictive relationships

To examine the relationship between the different types of goals and engagement in wiki collaborative writing, four separate regressions were conducted. The independent variables were the four types of goals: mastery, performance, prosocial, and social responsibility goals. The criterion variables included behavioral engagement, emotional engagement, cognitive engagement, and grades in the wiki project. Table 4 shows the results of the regression analyses.

Table 4: Goals as predictors of engagement and achievement.

	Behavioral engagement	Emotional engagement	Cognitive engagement	Grades
Mastery goal	.369***	.396***	.328***	.075
Performance goal	-.034	-.100	.055	.178**
Prosocial goal	.036	.167***	.127*	-.019
Social responsibility goal	.239***	.168***	.168**	.052
R^2	30.1%***	32.4%***	33.4%***	6.5%***

Note: * $p<.05$; ** $p<.01$; *** $p<.001$

Results indicated that mastery goal was a consistent positive predictor of the three different types of engagement: behavioral, emotional, and cognitive. Social goals were also important predictors. Prosocial goals positively predicted emotional and cognitive engagement, while social responsibility goals positively predicted the three types of engagement. Interestingly, grades on the wiki project was only predicted by performance goals.

5. Discussion

In general, the results of this study suggest that knowing the goals students are trying to achieve in school can explain, in part, how engaged they are when doing collaborative group work on a wiki platform. In particular, it was shown that mastery, prosocial, and social responsibility goals predicted engagement, while performance approach goals predicted actual achievement.

When students come into the classroom, they already bring with them a certain psychological baggage. Part of this baggage are the goals that they pursue in school. Psychological research has shown that different types of students would pursue different types of goals. It would be naive to assume that all students will be equally engaged when doing collaborative group work in wiki. Thus, teachers are advised to attend to the types of goals that students bring with them. Studies have shown that these goals are highly malleable and that teachers have an important role to play in shaping the types of goals that students would pursue (Jang, Reeve, & Deci, 2010; King & Ganotice, 2014).

Results of our study indicated that mastery, prosocial, and social responsibility goals were important predictors of behavioral, emotional, and cognitive engagement.Mastery goals have been

associated with a wide range of positive outcomes in previous research. Thus, it was not surprising to find mastery to positively predict all the three types of engagement

An interesting feature of our study was the inclusion of prosocial and social responsibility goals. Most educational psychologists fail to investigate the correlates of these goals and focus exclusively on mastery and performance goals. We thought that social goals would be especially important in collaborative settings. When students work with each other, goals aimed at helping each other (prosocial goal) and trying to keep promises and commitments to each other (social responsibility) would facilitate the cooperative learning process. Therefore, it is likely that social goals are especially important in collaborative group work. This assumption received support in the current study. We found that both types of goals positively predicted engagement.

Another interesting finding was that of all the four types of goals investigated only performance h goals positively predicted grades in the wiki project. Performance goals have been associated with both positive and negative outcomes in previous research. For example, performance-oriented students have been found to use more superficial learning strategies and were anxious. However, performance approach goals have been consistently associated with higher levels of academic achievement (e.g., Huang, 2012; Hulleman et al., 2010) and these results were replicated in our study. This

6. Conclusion

Taken together, results of the current study showed that goals were important predictors of engagement in a collaborative wiki environment. This study has important theoretical implications for bridging research in educational psychology with the literature on IT in education.

IT in education researchers have traditionally been interested in the use of information technologies for improving the student learning experience. However, they have paid insufficient attention to the role of motivational factors in influencing the quality of learning in technologically-enriched environments.

On the other hand, educational psychology researchers have conducted a number of studies on the role of goals in traditional classroom settings where the learning structure is mostly individualistic. They have not investigated how these goals would play out in a collaborative and technologically-enriched learning environment.

This study showed the possible synergies that could emerge by linking information technology research with educational psychology theorizing. It also has important practical implications. To facilitate learning, teachers are encouraged to cultivate students' mastery and social goals. Mastery goals could be encouraged by designing interesting and meaningful tasks. The use of norm-referenced assessment and evaluation could also be decreased. Collaborative group work has been shown to increase students' prosocial and social responsibility goals. Therefore, teachers could encourage the use of collaborative strategies to improve student learning (Johnson & Johnson, 2009).

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