Exploring the Impact of Students' Motivation and Self-regulation on the Social Nature of Online Learning Experiences

Abstract

This study is to explore how students' social experience of online learning is impacted by their motivation and self-regulation. Path analysis was employed to unfold the intertwined relationships among students' academic motivation, self-regulation, and social constructs of online learning. The results show that students' academic motivation has positive influence for students' social ability, sense of community, ease of use of social awareness notification tools, and learning satisfaction, while self-regulation was found to serve a central role between the relationships of ease of use and usefulness of notification tools to students' social ability and sense of community. Additional examination of sub constructs of motivation and self-regulation helped further understanding of how these constructs impact the social nature of online learning.

Introduction

Compared to face-to-face learning, online learning was found to have higher dropout rate resulting from limited support and dissatisfaction with teaching methods, unfamiliarity with the technology used, and a feeling of isolation (Carr, 2000; Kling, 2000). Thus, improvements in online learning may come from understanding how better to help students be involved in the social interaction of online learning and develop relationships with other members in the virtual learning environment. To better understand students social experience of online learning, previous studies have investigated the social nature of online learning via examining the relationships of critical social constructs (Rovai, 2003; Picciano, 2002; Authors, 2006; Authors, 2008; Authors, 2008a).

Theoretical Perspectives

Social Nature of Online Learning

Sense of Community (SOC). Sense of community is defined as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (McMillan & Chavis, 1986, p. 9). Students' sense of community was found to have positive correlation with their positive online learning attitudes and behaviors, including willingness to commit to, exchange information and support other students, and higher enjoyment of group work and learning satisfaction with lower feelings of isolation (Wellman & Gulia, 1999; Dede, 1996; Bruffee, 1993; Rovai, 2002a; Rovai, 2001).

Social Ability (SA). Social Ability is the person's capacity to associate with fellows and to use the members, resources and tools of the social context to achieve something of value. Previous studies have found that social navigation (SN), social presence with instructor (SPi), social presence with peers (SPp), written communication skills (WC), and comfort with sharing personal information (SI) are primary factors of social ability (Authors, 2006).

Technology Acceptance. According to Davis' (1989) Technology Acceptance Model (TAM), perceived usefulness (PU) and ease of use (PEU) are recognized as two factors in students' acceptance of new technology. Perceived usefulness is defined as "the degree to which an individual believes that using a particular system would enhance his or her job performance" (p. 320) and perceived ease of use is defined as "the degree to which an

individual believes that using a particular system would be free from physical and mental effort" (p. 320).

Motivation (MO)

Pintrich (1999) identified three generalizations about the relations between motivation and self-regulated learning. First, students must feel self-efficacious or confident that they can do the tasks. Second, students must be interested in and value the classroom tasks. Finally, students who are focused on goals of learning, understanding, and self-improvement are much more likely to be self-regulating than students who are pursuing other goals. However, for online learning environments there is a need for more research on the role of motivation in self-regulated learning. In an online learning environment, learners are more likely to require self-control which brings into play their own learning goals. Goal-oriented theory (Dweck, 1986) suggests that learners either have performance goal orientations or mastery goal orientations. Learners are guided in their activities, thought, feelings and performances by the type of goal orientation that they have.

Self-Regulation (SR)

According to Pintrich's point of view, self-regulated learning carried a social input component. Pintrich stated that SRL is "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behaviour, guided and constrained by their goals and the contextual features in the environment, (1999, p. 453)." The model proposed by Pintrich includes: (a) cognitive learning strategies, (b) meta-cognitive and regulation strategies, and (c) resource management strategies. In his model of SRL, Pintrich (2000) identifies four phases: (1) forethought, planning, and activation, (2) monitoring, (3) control, and (4) reaction and reflection. Researchers studying the social nature of online learning experience have considered self-regulation as critical factors of students' learning processes in an online learning environment.

Research Question

The purpose of this study is to explore how students' social experience of online learning is influenced by their motivation and self-regulation. Two research questions are addressed.

1. In what way and to what extent does students' academic motivation and self-regulation influence the social nature of their online learning experience?
2. In what way and to what extent does students' motivation and self-regulation influence students social ability in online learning experience?

Research Method

Research Context and Participants

A total of 125 students enrolled in these six courses were in a college of education invited to participate in an online survey in the end of the Fall semester 2007. All six courses were delivered online via the Sakai 2.0 course management system and have similar course structures. There was a 67.2% response rate resulting in 84 participants who completed the survey via the Internet.

Instruments

SOC. A total of 20 items from the Classroom Community Scale (Rovai, 2002b) were employed to measure students' sense of community.

SA. A total of 30 items from the Online Learning Experience Study Questionnaire (Authors, 2006) were utilized to measure students' perception of social ability in online learning environments. According to Authors (2006), five factors, including social presence with instructor (SPi), social presence with peers (SPp), social navigation (SN), written communication skill (CS), and comfort with sharing personal information (SI), were identified.

MO. To measure students' motivation for online learning, 17 items, including 4 items on intrinsic goal orientation (GO), 8 items on self-efficacy (SE), and 5 items on task value (TV), were adapted from the Motivated Strategies for Learning Questionnaire (MSLQ).

SR. Based on Pintrich's (2000) four phases (i.e. planning, monitoring, control, and reflection) and four areas (i.e. cognition, motivation/affect, behavior, and context) of self-regulated learning, a total of 16 items are developed to measure students' self-regulation of online learning.

TAM. To measure students' acceptance of a notification tools used in the Sakai learning environment (for being aware of others' activities in the online system), two main constructs, including PEU (6 items) and PU (6 items), were identified from the Technology Acceptance Model (TAM; Davis, 1989).

S. A total of 9 questions assessing students' learning satisfaction and satisfaction with course materials and teaching in the online learning environments were taken directly from the Zone Experience Study Questionnaire (ZESQ; Lin, 2005).

Data Analysis

To investigate the relationships among students' motivation and self-regulation of online learning with other social constructs of online learning experience, especially SA, path analysis was utilized. The path models were compared to help understand the changes of the relationships when considering motivation or self-regulation in the relationships. Also, further examinations of the relationship changes were conducted including students' motivation, self-regulation, and factors of social ability.

Results

Following path analysis, three primary models and two sub models are presented. The three primary models include: 1) first model: only the social constructs (i.e. PEU, PU, SA, SOC, and S) were included; 2) second model: MO was added to the first model; 3) third model: SR was added to the first model; and 4) fourth model: both MO and SR were added to the first model. Additionally, further examination of MO, SR and factors of SA yielded two sub models, including: 1) first sub model: three constructs of MO (i.e. GO, SE, and TV) and SA factors (i.e. SPi, SPp, SN, CS, and SI) were included; and 2) second sub model: SR was added to the first sub model. In the interest of the brevity needed for the proposal the detail results for the sub models will be included in the final paper but are excluded from this proposal.

Primary Path Models

First Primary Path Model. After discarding three non-significant paths, a final path model with best model fit was found. According to the criteria for a good model fit (non-significant χ^2 value, CFI and TLI >.95, SRMR<.10, and RMSEA<.06) suggested by Hu and Bentler (1999), all of the criteria were met, suggesting that overall the data fit the model well. Table 2 presents the fit indices of goodness for this over-identified model. Additionally the final model with R^2 values is presented in Figure 1.

Table 2. Model Fit Indices for First Primary Path Model

Model	χ^2	P	CFI	TLI	SRMR	RMSEA	RMSEA 90% C. I.
Criteria	N/A	>.05	>.95	>.95	< .10	< .06	
Results of the Final Model	3.702	.4472	1.000	1.005	.039	.000	.000 ~ .162

Note. N=81 (Hu & Bentler, 1999)

In the first path model, the R^2s means indicate that approximately 49% of the variance in satisfaction is explained by students' perception of SOC and PU. Also, members' perception of SA and PU contribute to explaining approximately 54% of the variance of members' SOC. Also, PEU accounts for 3% of the variance in members' SA. Last, PEU directly accounted for about 45% of variance of PU.

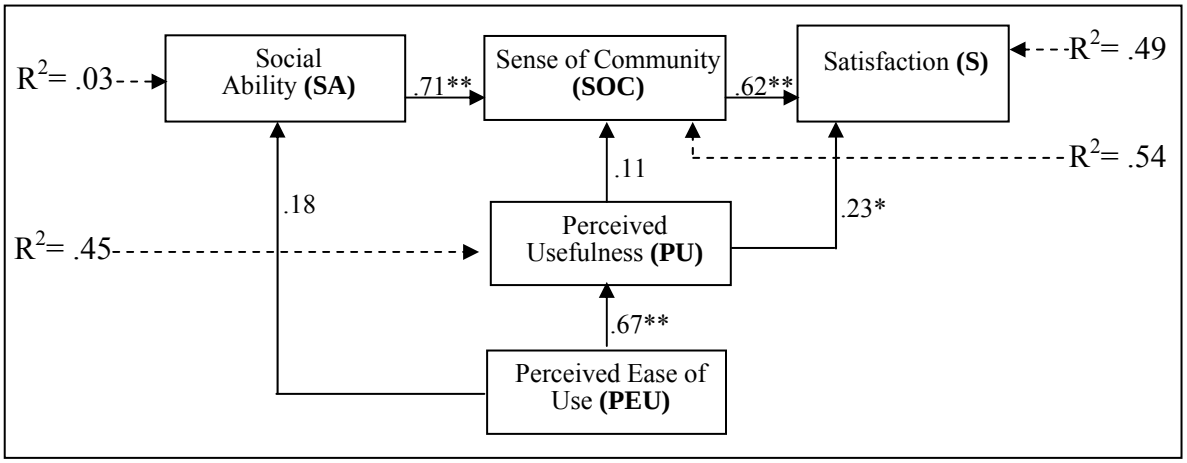

Figure 1. First Primary Path Analysis Model with R^2 Values (* z > 1.96, p < .05; ** z > 3.29, p < .001 statistically significant; ⟶ represents significant path, - - -▸ represents variance explained)

Second Primary Path Model. After discarding non-significant path, a final path model with best model fit was found. All of the criteria were met, which suggests that overall the data fits the model well. Table 3 presents the fit indices of goodness for this model and the final model with R^2 values is presented in Figure 2.

Table 3. Model Fit Indices for Second Primary Path Model

Model	χ^2	P	CFI	TLI	SRMR	RMSEA	RMSEA 90% C. I.
Criteria	N/A	>.05	>.95	>.95	< .10	< .06	
Results of the Final Model	2.446	.931	1.000	1.048	.037	.000	.000 ~ .039

Note. N=81 (Hu & Bentler, 1999)

After adding students' academic motivation in to the first primary model, the significant relationship between PU to S became non-significant and the non-significant relationship between PU to SOC become significant. Also, the variances of S, SOC, and SA explained by the path model increased.

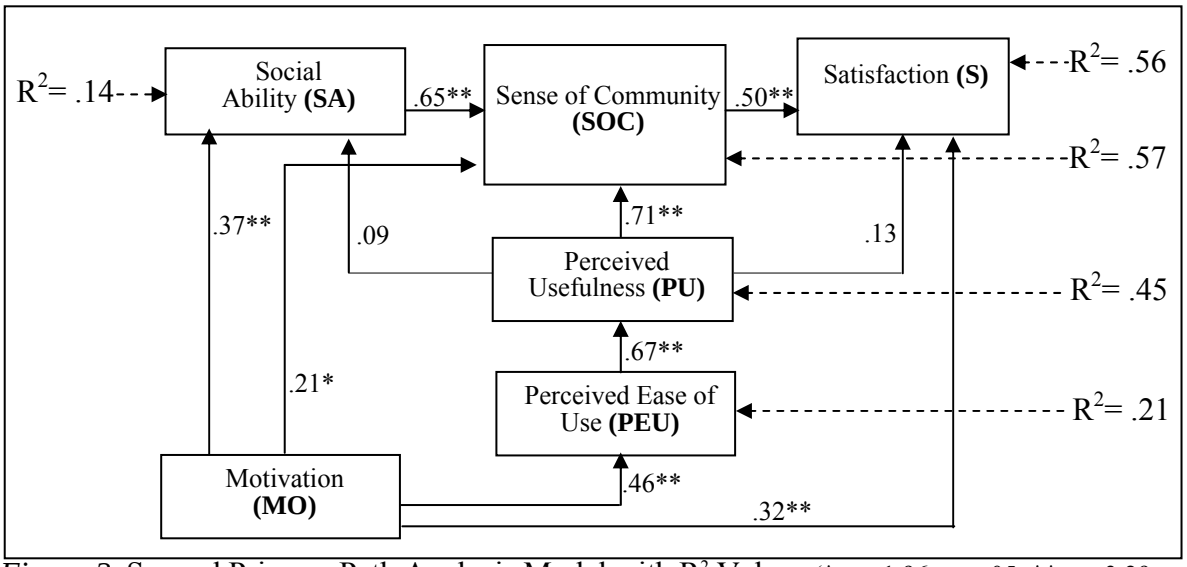

Figure 2. Second Primary Path Analysis Model with R^2 Values (* z > 1.96, $p < .05$; ** z > 3.29, $p < .001$ statistically significant; ⟶ represents significant path, - - -▸ represents variance explained)

Third Primary Path Model (Add SR Only). After discarding non-significant paths, a final path model with best model fit was found. Table 4 presents the fit indices of goodness for this model, and the final model with R^2 values is presented in Figure 4.

Table 4. Model Fit Indices for Third Primary Path Model

Model	χ^2	P	CFI	TLI	SRMR	RMSEA	RMSEA 90% C. I.
Criteria	N/A	>.05	>.95	>.95	< .10	< .06	
Results of the Final Model	7.387	.495	1.000	1.004	.041	.000	.000 ~ .124

Note. N=81 (Hu & Bentler, 1999)

Including self-regulation (self perceptions of ability to plan and monitor and sense of being in control and being reflective) removes the relationships of PEU to SA, PU to SOC, and PU to S. Interestingly this effect is explained by the near full co-variance of PU and PEU with SR. It appears that students who see the ease and usefulness of activity awareness are highly self regulative.

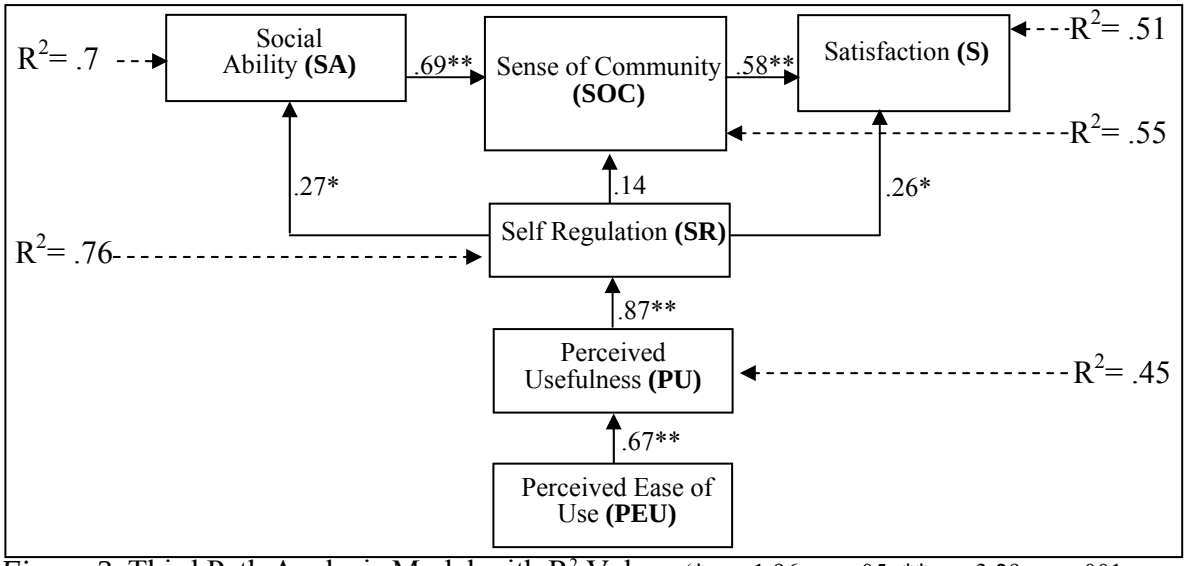

Figure 3. Third Path Analysis Model with R^2 Values (* $z > 1.96$, $p < .05$; ** $z > 3.29$, $p < .001$ statistically significant; ⟶ represents significant path, - - -▸ represents variance explained)

Fourth Primary Path Model (Add both MO & SR). A final path model with best model fit was found after discarding three paths in the Wald test. Overall the data fits the model well. Table 5 presents the fit indices of goodness for this model and the final model with R^2 values is presented in Figure 4.

Table 5. Model Fit Indices

Model	χ^2	P	CFI	TLI	SRMR	RMSEA	RMSEA 90% C. I.
Criteria	N/A	>.05	>.95	>.95	< .10	< .06	
Results of the Final Model	7.409	.595	1.000	1.011	.032	.000	.000 ~ .109

Note. N=81 (Hu & Bentler, 1999)

The R^2s means indicate that approximately 57% of the variance in satisfaction is explained by SOC, MO, and SR. Also, students' perception of SA, MO, and SR contributes to explaining approximately 57% of the variance of SOC. MO and SR account for 14% of the variance of SA. 76% of variance of SR is accounted for by PU and MO. MO accounts for approximately 21% of variance of PEU. Last, PEU directly accounted for about 45% of variance of PU.

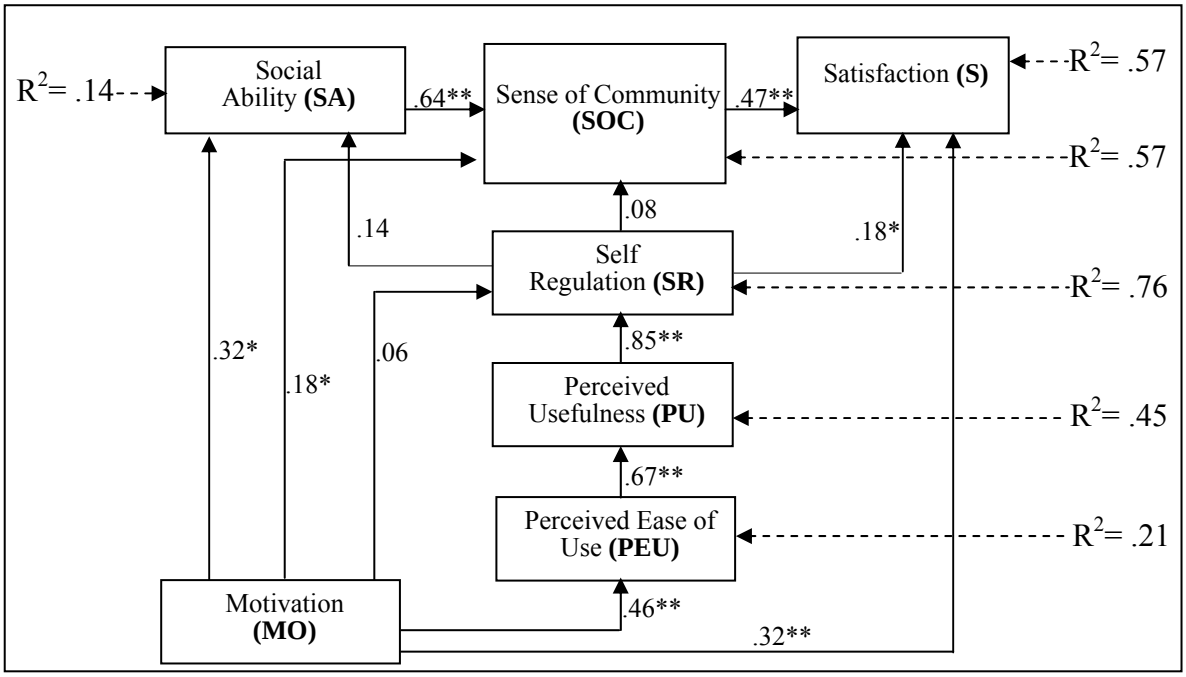

Figure 4. Fourth Primary Path Analysis Model with R^2 Values (* z > 1.96, $p < .05$; ** z > 3.29, $p < .001$ statistically significant; ⟶ represents significant path, - - -▸ represents variance explained)

Sub Path Models

First Sub Path Model (MOs v.s. SAs). Table 6 presents the fit indices of goodness for this model and the final model with R^2 values is presented in Figure 5.

Table 6. Model Fit Indices for First Sub Path Model

Model	χ^2	P	CFI	TLI	SRMR	RMSEA	RMSEA 90% C. I.
Criteria	N/A	>.05	>.95	>.95	< .10	< .06	
Results of the Final Model	3.453	.903	1.000	1.073	.025	.000	.000 ~ .055

Note. N=81 (Hu & Bentler, 1999)

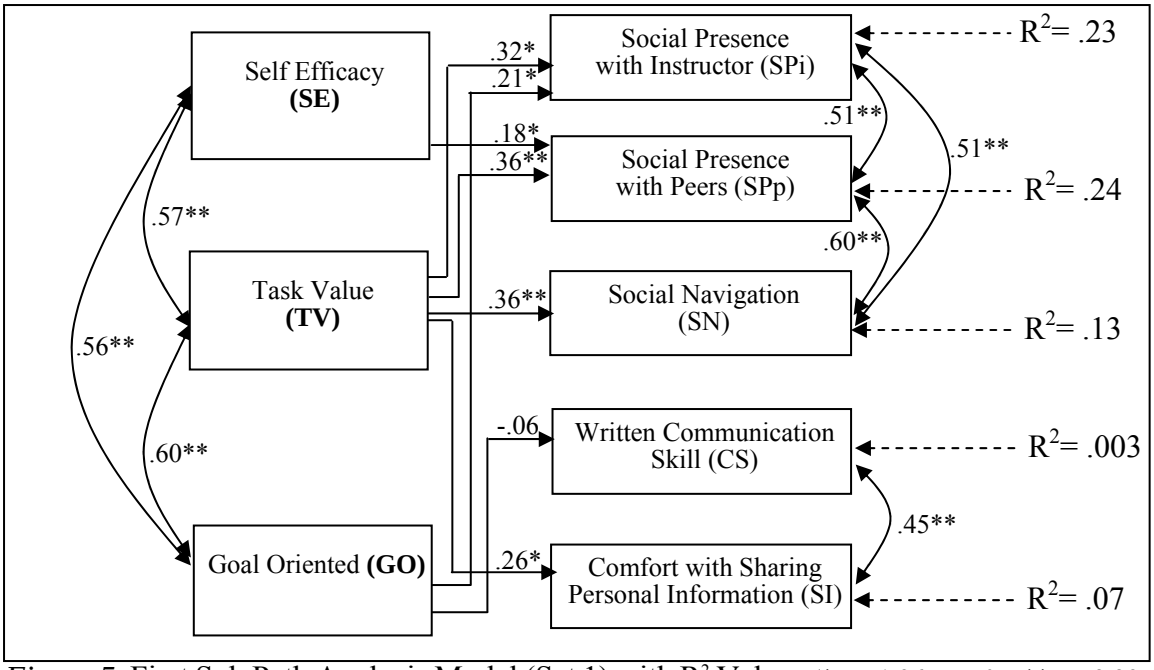

Figure 5. First Sub Path Analysis Model (Set 1) with R^2 Values (* z > 1.96, $p < .05$; ** z > 3.29, $p < .001$ statistically significant; ⟶ represent significant direct path, ⟷ represents significant correlation paths, - - - ▸ represents variance explained)

Second Sub Path Model (MOs & SR v.s. SAs). Table 6 presents the fit indices of goodness for this model, and the final model with R^2 values is presented in Figure 6.

Table 6. *Model Fit Indices*

Model	χ^2	P	CFI	TLI	SRMR	RMSEA	RMSEA 90% C. I.
Criteria	N/A	>.05	>.95	>.95	< .10	< .06	
Results of the Final Model	7.051	.721	1.000	1.041	.045	.000	.000 ~ .090

Note. N=81 (Hu & Bentler, 1999)

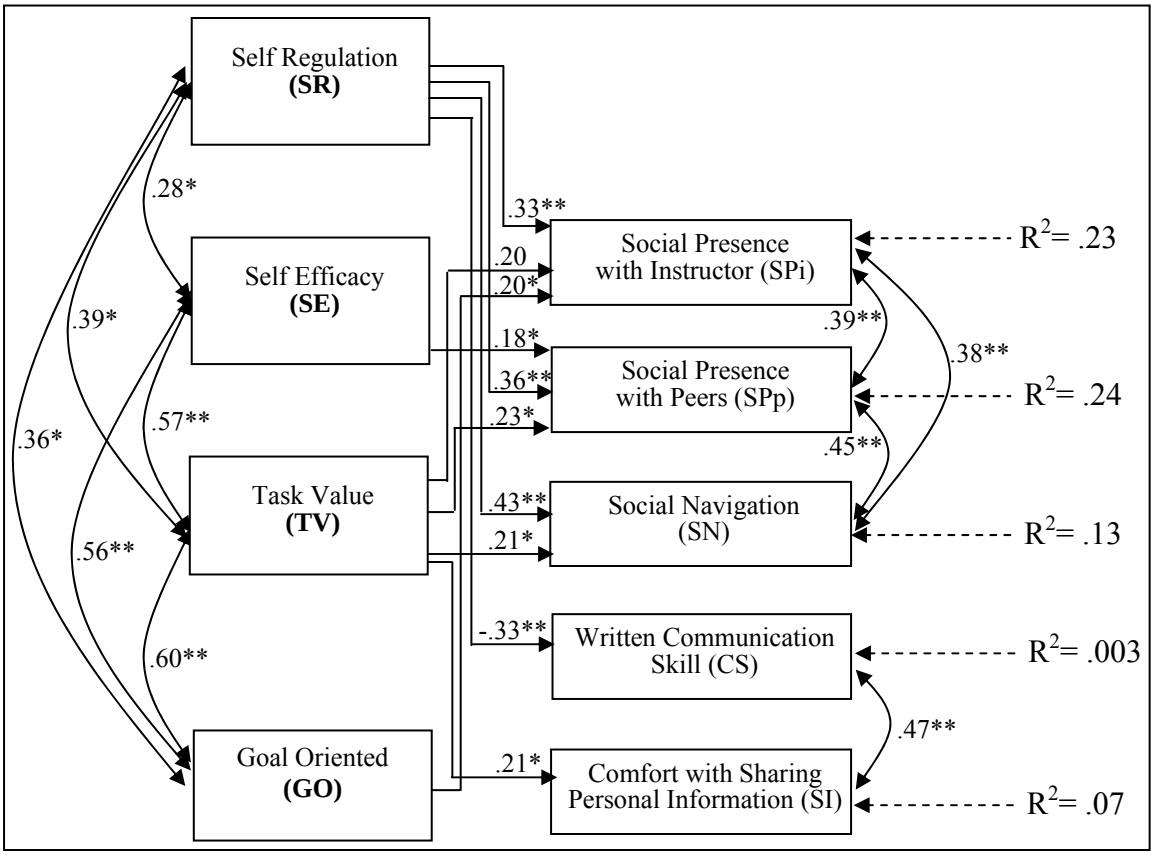

Figure 5. First Sub Path Analysis Model (Set 1) with R^2 Values (* $z > 1.96$, $p < .05$; ** $z > 3.29$, $p < .001$ statistically significant; ⟶ represent significant direct path, ⟷ represents significant correlation paths, - - - ▸ represents variance explained)

Discussion

In the primary path models, results again confirmed with the previous study (Authors, 2008b; Cho et al., 2008). The SR has significant effect on SA, S, SOC. In the secondary path models, MO was tested only, and the results of this model show MO is more significant on PU than that on PEU in the second primary path model. In the third path models, the results of this model show SR is accounted significant on PU and PEU, SR is implying students' ability with the use of tool. According Printinch's model, one of the four areas is Area of Social. If social has been an area in SR students' SA and SR should have positive correlation. For motivation, the results from the first sub path model show that goal oriented learners are more adjusted to instructors. Students who have higher SA have made social presence with instructors. It again explains that daily learning skills among peers in traditional learning environment can possibly be trained to transfer into online learning environment if students' goals are strong and motivated. In the last sub model looking at students' SA and SR, results show that students' SA is significantly related to SPi, SPp, SN, and WC, but not significant on SI. It indicates that SI does not related directly to SR. Mostly, SR looks into a learning process with specific learning objectives, and here the comfort of sharing personal information is related more closely with affective and emotional factors of the individuals.

Importance of the Study

Technology is considered as a cognitive tool (Lajoie, 1993), a great amount of research has been conducted on and self-regulated learning and motivation in the context of online learning (Avesdo, 199X, 2008) . However, a gap still exists between these two lines of research. We still do not know in exactly which ways how motivation and self-regulated learning influence on social constructs of human-computer interaction processes. The present study was conceived to fill this gap by investigating the influence of students' academic motivation and self-regulation to their online learning experiences. The findings support system developers and instructional designers to better develop online learning tools and learning activities.

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