Online Interaction Quality among Adult Learners: The Role of Sense of Belonging and Perceived Learning Benefits

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ABSTRACT
The present study employs social cognitive theory (SCT) and social capital as the guiding frameworks to explain online interaction quality among learners in a blended learning program (*N*=179). Capturing performance expectancy by perceived learning benefits and online interaction quality with nuanced cognitive measures, the study aims to validate how the SCT and social capital, which are mostly used in predicting online interaction quality in virtual settings, are applicable in an academic setting. More specifically, we investigate the relationship between trust, norms of reciprocity, sense of belonging, altruism, perceived learning benefits and learners' perception of online interaction quality. Data were collected quantitatively by means of a questionnaire. Confirmatory factor analysis (CFA) and path analysis were employed to validate the instrument and answer the research question respectively. The findings show that only sense of belonging and perceived learning benefits significantly account for a moderate variance in online interaction quality (R^2 = .46). Based on the findings, implications for instructional practice and further research are suggested.

Keywords: online interaction quality, social capital, perceived learning benefits, and adult learners

INTRODUCTION
Different instructional approaches such as scaffolding, prompting, and role assignments have been adopted by instructors in online and blended learning to enhance learners' participation in online discussions. Of equal importance, the quality of these online discussions is also a major concern. If high level of online participation is hard to achieve, high quality of online interaction is even more difficult to reach. There are different factors inhibiting adult learners from being active online, e.g. assuming different roles during the undertaking of the study or the preference of interacting with those of similar backgrounds (Yukselturk, 2010). Nevertheless, the decision to dedicate time and effort to online discussion of adults are normally weighted based on cost-benefits evaluation (Kollock, 1999). This means of learners are intrinsically and extrinsically motivated in their online participation, factors related to situational variables will be of less significance.

The quality of online interaction has been investigated in a number of settings. For example, Peltier, Schibrowsky, and Drago's study (2007) confirms that instructor's facilitation has a positive impact on learners' perception of online interaction quality. Additionally, Lee and Bonk (2016) found that the higher the degree of closeness learners perceived, the more they became involved in their online participation in blogs, thus contributing more to the community of learners. In virtual learning communities in which the sharing of knowledge is voluntary, Chang and Chuang (2011) and Chiu, Hsu, and Wang (2006) found that social capital, measured by trust, norms of reciprocity, and sense of belonging significant predict the quality of knowledge sharing. The nature of virtual learning communities and the learning communities of adult learners share the essence that their members are more likely to contribute and advance the quality of online interactions when they are motivated and intrigued by factors other than obligation from the course requirement. Thus employing the social capital framework along with factors related to learners such as performance expectancy as an extrinsic motivational factor and altruism as an intrinsic motivational factor would provide more insights regarding

enablers of online interaction quality. However, research findings up to date have revealed that such studies in formal education settings are still scarce. The results from studies in virtual learning communities as those carried out by Chang and Chuang (2011), Chiu et al. (2006) and Lampel and Bhalla (2007) cannot be generalized to adult education settings for a number of reasons. The first is that the quality of online interaction or knowledge sharing in these studies is that of being accurate, reliable, complete and understandable (Chiu et al., 2006). Thus when applied to educational setting, such measures of the quality of online interaction cannot comprehensively capture the cognitive essence required for academic knowledge development. Second, performance expectancy in virtual learning communities is conceptualized as reputation and community building (Chang & Chuang, 2011; Chiu et al., 2006). These outcome expectations are not applicable in formal education settings as adult learners may not have that motivation of enhancing individual status and expanding social connections with peers given that they have other options in addition to online interaction opportunities.

Against these backgrounds, the present study aims to bridge the gap in literature by investigating how social capital and factors related to learners' motivation such as altruism and performance expectancy measured by perceived learning benefits are associated with online interaction quality. Conducted in the context of formal education setting that employs blended learning as mode of instructions, the present study aims to unravel critical factors contributing to the quality of online interaction among a group of adult learners who are heterogeneous in their socio-demographic background. More specifically the following research question is addressed: What are the relationships between social capital and learners' personal-related factors, namely, altruism and perceived learning benefits and online interaction quality? In addition, we also examine if these relationships are moderated by learners' socio-demographics, including age, gender, educational attainment, and employment status.

THEORETICAL BACKGROUND

The quality of online discussion or knowledge sharing by members in a learning community is affected by various factors. Hsu, Lu, Yen and Chang (2007) argue that the extent to which individuals contribute to the learning community is contingent on their personal motivation and the social environment, of which they are a member. Researchers have based largely on the Socio Cognitive Theory (Bandura, 1989) to explain the behaviors of knowledge sharing in an online learning community, e.g. Chiu et al. (2006). The Social Cognitive Theory states that a person's behavior is influenced by the social networks and their cognition, e.g. expectations including outcome expectations and self-efficacy (Bandura, 1989). Previous studies have included social capital as aspects of the social networks and performance expectancy and altruism as those of personal cognition in explaining the quality of online interaction among learners (e.g. Tamjidyamcholo, Baba, Tamjid & Gholipour, 2013). Self-efficacy, being one of the factor in the SCT, is not included in most studies, e.g. Hsu et al. (2006) for the reason that self-efficacy is context-specific and hence is subject to change over time (Chen, Gully, & Eden, 2001). Thus in the following section, factors related to the social environment, namely social capital and personal cognition including performance expectancy and altruism that are hypothesized to be associated with online interaction quality are discussed.

Online interaction quality

Due to the fact that the context in previous studies is different from academic settings, the online interaction quality is measured by the quality of information shared rather the cognitive aspects related to knowledge construction such as triggering self-reflection and knowledge transfer. Taking this into account, the present study adopts the cognitive presence scale from Arbaugh, Cleveland-Innes, Diaz, Garrison, Ice, Richardson, and Swan (2008) to capture the online interaction quality among the adult learners in a blended learning program. We define online interaction quality as an evaluation of how the learners perceive the interaction with other learners help them to build up their knowledge related to the courses and facilitate knowledge transfer.

Social capital

According to Putnam (2000), social capital refers to the networks, norms, and social trust that foster the collective processes and actions of members within a community for the public good. From a different standpoint, Bourdieu (1986) and Coleman (1988) (cited in Zhang & Kaufman, 2015) address social capital as the social networks and resources obtained by individuals through their memberships and interactions within the community. Bourdieu and Coleman's conceptualization of social capital implies that individuals can benefit from the community of their membership whereas Putnam proposes that the community can benefit from the social capital generated through the interactions among its members (Oztok, Zingaro, Makos, Brett, & Hewitt, 2015; Zhang & Kaufman, 2015). Despite different emphasis, these authors share the idea that social capital results from the dynamic interaction among members and an increase in social capital is beneficial for individuals and the community (Oztok et al., 2015).

When investigating the role that social capital plays in enhancing the quality of online interaction among learners, we view the concept from Putnam's perspective. This means that the trust, sense of belonging, and norms of reciprocity among the classmates are hypothesized to motivate them to actively contribute to the online discussions for leveraging the quality of one another's learning. In this study, we adopt the definition of trust, norms of reciprocity, and sense of belonging from Chang and Chuang (2011) to conceptualize and operationalize social capital. Accordingly, trust is defined as "individual beliefs and expectations that other participants can perform consistent behaviors to follow norms and principles of a virtual community" (Chang & Chuang, p.12). The authors refer to norms of reciprocity as the perception of fairness to mutually share knowledge to each other in a virtual community and sense of belonging as feeling of belonging to a group or a set of people. These three constituents of social capital have been confirmed as significant factors relative to online interaction quality in virtual communities in Chang and Chuang (2011), Chiu et al. (2006), and Tamjidyamcholo et al. (2013).

Altruism and performance expectancy

Altruism is defined as the offer to help others by voluntarily sharing knowledge without an expectation of a return from the recipients (Kollock, 1999; Steward & Gossain, 2006; Yu & Chu, 2007). According to Hung, Durcikova, Lai, and Lin (2011), altruism is considered a type of intrinsic motivation that triggers one's knowledge sharing to the community. However the authors found a non-significant effect of altruism on the quality of knowledge shared, which is in line with the findings from Lampel and Bhalla (2007) and contradictory to the results from Chang and Chuang (2011). In this regard, it is relevant to take Kollock's (1999) opinion into account, who postulates that altruism may compete with extrinsic motivation such as the evaluation of the gain that can be obtained. In fact, Hsu et al. (2006) and Hung et al. (2011) found that extrinsic motivation such as reputation is stronger than altruism in predicting the quality of online interaction in a community. In an educational setting, research validating the role of altruism as a measure of intrinsic motivation and performance expectancy as extrinsic motivation concerning online interaction quality is not yet recognized. In addition, performance expectancy in existent studies mainly focuses on reputation, community development, and network expansion. These outcomes are not highly relevant in educational settings because the most important motivation and goals of one's participation in online discussions related to the courses under question is the perception of how the community can help them to build and expand their knowledge repertoire. Therefore, this study addresses these two gaps by using perceived learning benefits of a measure of performance expectancy. The construct is adopted from Xie and Ke (2011) to capture the perceptions of learners as to how the learners evaluate the value of online discussion relative to their learning.

Based on these theoretical backgrounds, we hypothesize that social capital measured by trust, norms of reciprocity, and sense of belonging and learners' intrinsic and extrinsic motivation measured by altruism and perceived learning benefits respectively, will have a positive relationships with the quality of online interaction as perceived by the learners.

METHODOLOGY

Research design

The present study employed a quantitative approach to data collection by means of a questionnaire. Data were collected one time in different centers for adult education in Flanders (Belgium). Thus in terms of design, the study is cross-sectional in nature. The questionnaire was distributed both online on the researchers' institutional platform or in the participants' classrooms with the presence of their instructors and one of the research members. To minimize issues related to common method bias, the participants were encouraged to give answers most relevant to them and therefore, no right or wrong answers were the case. The participation in the study was totally voluntary, i.e. no incentives were given and the anonymity of the participants was guaranteed.

Participants

The participants in this study are learners who were following the Specific Teacher Training program. The program employed blended learning as an instructional strategy. Learners who have successfully completed the program are granted with a certification to be qualified for teaching at secondary levels. After screening for incomplete and unengaged answers, one hundred and seventy nine questionnaires were retained for analyses. The number of female learners (61.5%) is nearly twice as much as male learners (38.5%). Higher secondary degree holders (57.5), constitute the majority, followed by higher education degree holders (39.1%) and lower secondary degree holders (3.4%). As for employment, learners who have a fulltime job is the biggest group (62.6%). Those who are part-timers accounts for 20.7% and those who are full-time enrolled 10.6%. Learners aged between 18-30 accounts for half of the sample, followed by those aged between 31-40 (32.4%) and 41-50 (17.3%). The average age of the participants is M=32.08, SD=7.82.

Instrument

The present study used existing scales validated from previous studies. As for the independent variables, social capital including three dimensions, i.e. trust, norms of reciprocity, and sense of belonging, and altruism were adopted from Chang and Chuang (2011) and Chiu et al. (2006). Perceived learning benefits measuring how the learners perceived that online interactions with peers contribute to their understanding of the course were adapted from Xie and Ke (2011). Regarding the dependent variable quality of knowledge sharing, we have opted to modify the cognitive presence scale from Arbaugh et al. (2008) because the scale is more nuanced and applicable for capturing the cognitive quality of online interaction among a community of adult learners rather than a professional learning community as in Chang and Chuang (2011) and Chiu et al. (2006). In total, there are 32 items included in the questionnaire. After the scales have been decided upon, face validity had been verified by three experts in the fields of adult learning and social capital before they were translated into Dutch, which is the mother tongue of the participants. When there were discrepancies in the translation, a third Dutch-native colleague was consulted to ensure the clarity of the items' meaning into without losing the essence of the items in English.

Data analysis method

To answer the research questions, we applied Partial Least Square-Structural Equation Modeling (PLS-SEM) as method of data analysis. Accordingly, the analyses consisted of two phases. First the measurement model was validated by confirmatory factor analysis (CFA). At this step, construct validity was evaluated by two rules of thumbs suggested by Fornell and Larcker (1981) and Chin (1998) such that the average variance extracted (AVE) for each construct should be equal or greater than .50 and the square root of the AVE of each construct should be greater than the correlations of this specific with others. The second step in PLS-SEM was to confirm the hypotheses by means of path analyses. All these two steps were conducted by employing SmartPLS 2.0 M3 (Ringle, Wende, & Will (2005).

RESULTS

Measurement Validation

Confirmatory factor analysis shows that all items have adequate factor loadings (>.400) onto to their respective constructs. Thus no items have been removed. Table 1 presents the mean, standard deviations, the *AVEs*, composite reliability, and Cronbach's alpha.

Table 1: The mean, standard deviations, average variance extracted (*AVEs*), composite reliability, and Cronbach's alpha of the constructs

Constructs	*M* (*SD*)	*AVEs*	Composite reliability	Cronbach's Alpha
Trust	3.61 (0.56)	.57	.87	.82
Norms of reciprocity	3.78 (0.76)	.85	.92	.82
Sense of belonging	3.51 (0.72)	.76	.93	.90
Altruism	4.17 (0.63)	.84	.94	.90
Perceived learning benefits	3.33 (0.70)	.67	.91	.88
Online interaction quality	2.92 (0.91)	.68	.96	.96

As for divergent validity, the square root of *AVE* of each construct displays greater value than the correlations between the constructs themselves. This reveals that multi-collinearity is not a concern in this sample. Table 2 presents the *AVEs* and the correlations among the constructs.

Table 2: The correlations among the constructs with their respective *AVEs* (in bold)

Constructs	OIQ	AL	PLB	NP	SB	T
OIQ	**.82**					
AL	0.114	**.92**				
PLB	0.619	0.235	**.82**			
NP	0.293	0.554	0.275	**.92**		
SB	0.417	0.469	0.362	0.586	**.87**	
T	0.237	0.360	0.125	0.526	0.572	**.75**

Notes for abbreviations: Online interaction quality (OIQ), altruism (AL), perceived learning benefits (PLB), norms of reciprocity (NP), sense of belonging (SB), and trust (T).

The structural model

As the measurement model has been confirmed, path analyses were followed to identify the significant predictors of online interaction quality. According to the results presented in Table 3, perceived learning benefits were the most significant factor (β=.55, p<.001). However, altruism did not significantly predict online

interaction quality (β=-.18, p>.05), which means extrinsic motivation has outweighed intrinsic motivation. Among the three constructs of social capital, only sense of belonging was found as the significant factor (β=.23, p<.05). Altogether, the significant predictors account for a variance of 46% in online interaction quality, which shows a medium effect according to Hair, Ringle, & Sarstedt (2011).

Table 3: Result from path analysis for the outcome variable online interaction quality (R^2 = .46)

Independent Constructs	Standardized coefficients	*t*-statistics
Trust	.08	.86
Norms of reciprocity	.07	.64
Sense of belonging	.23	1.97*
Altruism	-.18	1.79
Perceived learning benefits	.55	7.22***

Notes: *p<.05, **p<.001

Analyses of variance

Analyses of variance, including ANOVAs and *t*-tests were used to examine if socio-demographic variables may affect the relationship among the variables.

(1) T-test result showed that there was no significant difference between male and female learners regarding perception of online interaction quality, $t(177) = 0.277$, $p = .785$.

(2) The results from ANOVA reveal that there was no statistical differences among the three age groups of learners as for perception of online interaction quality, $F(2) = 0.067$, $p = .935$. However, a significant difference was found among learners who have different educational attainment, $F(2)=4.692$, $p = .01$ and employment statuses, $F(2) = 3.362$, $p = .037$. Post-hoc analyses further revealed that learners who hold a higher education degree ($M = 2.67$, $SD = 0.04$) had significant lower mean scores than higher-secondary degree holders ($M= 3.09$, $SD = 0.84$). In addition, learners who were a part-timer scored higher ($M = 3.16$, $SD = 0.85$) than learners who were fulltime enrolled ($M = 2.5$, $SD = 0.91$).

As educational attainment and employment status can moderate the relationships between the independent variables, namely altruism, perceived learning benefits, trust, norms of reciprocity, and sense of belonging and online interaction quality, we conducted multi-group moderation to validate the model. Following Keil, Saarinen, Tan, Tuunainen, Wassenaar, and Wei's (2000) approach, the model parameters or regression coefficients and standard errors (*SE*) of each path were estimated for each group. Subsequently, *t*-statistics were applied to find out if the effects of the five independent variables were significantly different as a function as group differences. However, all *t*-statistics were non-significant indicating that educational attainment and employment status were not significant as moderators. The results of multi-group moderation analyses are presented in Table 4.

Table 4: Results of multi-group moderation for educational attainment and employment status

Latent variables	Higher secondary degree holders (n=103)		Higher education degree holders (n=70)		*t*-statistics	*p*-values (*2-tailed*)
	Regression coefficients	*SE*	Regression coefficients	*SE*		
Altruism	-0.07	0.11	-0.28	0.12	1.27	0.21
Perceived learning benefits	0.51	0.08	0.61	0.07	0.88	0.38
Trust	-0.03	0.14	0.15	0.09	0.96	0.34
Norms of reciprocity	0.15	0.11	0.02	0.10	0.83	0.41
Sense of belonging	0.19	0.12	0.10	0.11	0.57	0.57
Latent variables	Part-time learners (n=37)		Fully-enrolled learners (n =19)		*t*-statistics	*p*-values (*2-tailed*)
	Regression coefficients	*SE*	Regression coefficients	*SE*		
Altruism	-0.25	0.13	-0.14	0.11	0.59	0.56
Perceived learning benefits	0.54	0.06	0.41	0.08	1.28	0.21
Trust	0.17	0.15	0.16	0.19	0.06	0.95
Norms of reciprocity	0.34	0.12	0.07	0.16	1.32	0.19
Sense of belonging	0.22	0.19	0.36	0.16	0.48	0.64

DISCUSSION AND CONCLUSION

Based on SCT (Bandura, 1989) and social capital theory (2000), the present study investigates the relationships between social capital, personal related factors, i.e. altruism and perceived learning benefits, and online interaction quality. The study has operationalized perceived learning benefits and online interaction quality in such a way that is more relevant to a community of adult learners following a formal education program. Multigroup moderation was also conducted to examine the moderating effects of socio-demographic factor. Yet, non-significant moderation was found.

Although outcome expectancy in this study was captured by perceived learning benefits to be more relevant in education settings, its positive relationship with online interaction quality is in line with previous studies (Chang & Chuang, 2011; Chiu et al, 2006). However, altruism as a measure of learners' intrinsic motivation failed to predict online interaction quality, which is also found in Hung et al. (2011) and Lampel and Bhalla (2007). This finding highlights that in virtual learning communities, intrinsic motivation manifest in altruism is more important to explain the quality of interaction because the sustainability of the communities highly depend on the voluntariness of each member. In educational settings, altruism may lack its prevalence because the need to sustain the online interactions among the learners may not be the responsibility of the learners but the instructors instead. Given this lack of need, the learners may rely on their evaluation of performance expectancy, namely perceived learning benefits as the sole motivation for their quality contribution. In addition, as most learners in this sample are employed fulltime and part-time, the evaluation of cost benefits has outweighed altruism. Thus to successfully enhance the quality of online interaction, it is suggested that the instructors can explicitly clarify how online interactions with peers are aligned with the learning objectives. In so doing, the learners will be more motivated to substantially contribute to online discussions and overcome barriers such as the lack of time due to other obligations.

Contradictory to most studies that employ the social capital framework to explain online interaction quality, only sense of belonging was positively correlated with the dependent variable. That trust and norms of reciprocity were found to be non-significant suggest that learners in a program may have known each other and consider that helping each other in need is a normal practice. Then there is not that high variability in terms of trust and norms of reciprocity among learners in a program whose identities are more visible than those in virtual learning communities as investigated by Hsu et al. (2007). Being found as a significant predictor, sense of belonging has demonstrated that it is the most significant element of social capital in online learning environment as initially postulated by Rovai (2002). Thus, an online learning environment in which learners feel that they share a common goal, e.g. enhancing knowledge on a particular topic or tackling an educational issue, and that they are highly welcomed to present their voices is desired to bring about high quality of online interaction. To achieve this goal, again the instructors' strategies in creating opportunities for the sharing of personal background and lived experiences among learners as suggested by Nistor, Daxecker, Stanciu, and Diekamp (2015) is recommended. Additionally, effort to build up common goals and missions related to the professional career such as an educator identity as in this study, should also be invested as this helps the learners feel more connected to one another and chances are that they will be more active in their online contributions.

There are some limitations that make the generalization to be taken with caution. First, although self-report questionnaires can be the most appropriate method to capture relative concepts such as trust, sense of belonging and perceived learning benefits, it is recognized that the quality of online interaction can be better measured by objective methods such as message coding. Therefore, future research with more objective measures of online interaction will help to further validate the findings. The translation of the questionnaire is also one factor that needs to be taken into account. More specifically, we suggest validating the questionnaire in an English-speaking sample to confirm the reliability and validity of the measurement model. Third, that the participants in this sample were adult learners following a common program, namely Specific Teacher Education, may limit the interpretations of the results in hard disciplines such as Computer Science. For example, Neumann, Parry, and Becher (2002) postulate that learners in different disciplines may have different epistemological beliefs and learning approaches with soft-disciplined faculty being more subscribed to reflective discussions as method of knowledge construction. Therefore, we suggest that a comparative study using disciplines as a moderator can be more helpful to gain more insights into the critical enablers of online interaction quality.

In conclusion, in an adult educational context, the present study has revealed that the SCT and social capital theories can be relevant to explain the quality of knowledge sharing among learners in a blended learning program. The two critical elements that have been identified are perceived learning benefits and sense of belonging, which help to explain a moderate variance in learners' perception of online interaction quality. Based on these findings, implications for instructional practices have also been proposed. In essence, making learning

goals explicit, underlying how online interaction is important to one's learning, and creating a mutually respectful environment with shared goals and identity are of significance to enhance the quality of online interaction among learners.

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