



# The effect of locus of control on learners' sense of community and academic success in the context of online learning communities



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## ARTICLE INFO

### Article history:

Accepted 18 June 2015

Available online 23 June 2015

### Keywords:

Individual differences

Locus of control

Online learning communities

Academic success

Problem-based learning

## ABSTRACT

With the advancements in internet and its tools, students have started using online learning communities, where they come together to discuss their opinions. While various studies have been carried out in relation to the design of efficient learning environments at online platforms, some of them have taken the individual characteristics of the students into consideration. This study aims to determine the effect of the locus of control on the sense of community and academic success as individual characteristics. The study was carried out with the teacher candidates who enrolled in the Programming Languages II Course in the Computer Teaching and Instructional Technology Program in Turkey. Problem-based learning method was applied in online learning environment. According to the results of the research, the environment, which was developed considering the type of the locus of control, had no effect on the sense of online learning community and the level of academic success.

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## 1. Introduction

With the introduction of new developments in technology and especially in the Internet, learners have started to have discussions with teachers and other learners by interacting with them through the use of synchronous and asynchronous communication tools (Angeli & Schwartz, 2014; Wang, 2008). The term discussion is defined in educational context as comparing views or coming together intentionally (Rourke & Anderson, 2002). Wilson and Ryder (1998) define the “learning community” as a group of people supporting each other in learning programs. Those who learn through online learning communities have acquired a new environment, as an alternative to face-to-face learning environments, in order to structure the knowledge. McConnell (2006, p. 19) defines learning community as “a cohesive community that embodies a culture of learning and member are involved a collective effort of understanding”. By supporting social structures, learning communities provide an opportunity to gain experiences and share; it also supports interaction, that is, the process of knowledge structuring and critical thinking in learning (Blanton, Moorman, & Trathen, 1998).

Various studies have been carried out on the design of efficient online learning environments (Beetham & Sharpe, 2013; Garrison, 2011; Garrison & Akyol, 2015; Hou, 2015; Küçüközer, 2013; Rae & Samuels, 2011; Tang & Lam, 2014). For teaching to be efficient it is necessary to integrate the cognitive, affective and physiological characteristics of

learners with educational needs and to adapt the teaching according to these characteristics (Uysal & Yalın, 2012). There has been an increasing literature dealing with various characteristics of the learners (Dabbagh & Kitsantas, 2012; Jonassen & Grabowski, 2012; Lo, Chan, & Yeh, 2012; Narciss et al., 2014; Peredo, Canales, Menchaca, & Peredo, 2011; Tseng, Chu, Hwang, & Tsai, 2008). In current studies, computer programming is an area that is being researched both from the perspective of the characteristics of individual students and the teaching of subjects in various educational settings. There are classes and activities aimed at teaching computer programming from an early age both in Europe and the USA. The learning and teaching of programming languages are considered as difficult processes by both students and teachers; students often have difficulties in adapting computer programming syntax to programming problems (Black, 2006; Shadiev et al., 2014). Some of the factors also affecting success in programming language classes are motivation, the individual characteristics of the student, their attitude towards programming, the complexity of the programming language, and the design and methods of the teaching (Gilbert, 2000; Jones, 1998; Tüzün, 2007; Uysal & Yalın, 2012). Booth (1992) states that programming does not only include coding, but also requires lifelong learning and the ability to develop new problem-solving skills throughout life. Due to the various positive effects computer programming is said to have, there continues to be considerable interest and research into its teaching and design. (Ke, 2014; Uysal & Yalın, 2012). A review of studies into the ‘sense of community’ in online learning (Gökçeşlan, 2013a) shows that individual factors such as learning style and demographic characteristics are often studied, however there has been a lack of studies looking at the locus of control and design of learning processes on the basis of individual

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<sup>1</sup> This study is part of the first author's PhD thesis.

characteristics, although locus of control is an important aspect of online learning (Hsia, Chang & Tseng, 2014; Joo, Lim, & Kim, 2013; Murray, Fox, & Pettifer, 2007). Therefore, the focus of this study is the design of learning environments according to the locus of control and the effects of this design on academic success and the sense of community experienced in online learning communities.

## 2. Literature review

### 2.1. Locus of control

Anderson (2000) puts forward that individual characteristics of students such as field dependence, activeness/passiveness, locus of control, learning style, self-efficacy, meta-cognition, ambiguity tolerance, anxiety, self-sufficiency and motivation are important variables in the design of a web-based course, as they reflect on a student's attitude and knowledge. One of these variables, locus of control, is the perception of an event by an individual either as a result of his/her own behaviors or as an effect of environmental factors such as luck, fate, etc. In this context, locus of control is an individual's general expectation that he/she either has control over his/her behavior or that his/her behavior is under the control of others (Rotter, 1966). As quoted from Rotter (1954) by Dönmez (1985), the theory of social learning, which is the starting point of locus of control, was formed as a result of the integration of behavioral theory and cognitive learning theory. Rotter's theory of social learning includes the variables of behavior, expectations, results of behaviors and psychological situations. If an individual has the tendency to consider events as results of his/her own behaviors, then he/she has an "internal locus of control"; if an individual has the tendency to consider events as effects of environmental factors, then he/she has an "external locus of control" (Lefcourt, 1982).

In the context of online learning, locus of control affects some variables, such as student success, performance, satisfaction, adaptation to the environment, participation in activities, class attendance, attitude towards web-based learning, ability to complete education, participation in online activities, e-learning acceptance, etc. (Corbeil, 2003; Hsia, Chang, & Tseng, 2014; Joo, Joong, & Sim, 2011; Murray et al., 2007; Parker, 1999; Severino, Aiello, Cascio, Ficarra, & Messina, 2011; Tekedere & Mahiroğlu, 2012; Wang, 2005). Therefore, examining the effect of locus of control will contribute to the literature on online learning communities.

### 2.2. Sense of online classroom community

It is stated that the research about online learning should focus on distance learners and their needs (Richardson & Newby, 2006). The teacher and the learner are in different environments during online learning, and this situation causes the learners to feel alone or distant from the classroom environment. The sense of community significantly decreases when students are in separate physical environments. This decrease is accompanied by a number of problems, such as social isolation, decreased attention and increased distraction, and it is one of the reasons causing distance learners to discontinue their courses or education and drop out from education (Rovai, 2002). Community learning provides a suitable environment for prospective teachers' learning needs (Cone, 2012). That being said, the sense of community itself is the best predictor of successful learning in online learning communities (Top, 2012).

A sense of community is the members' sense of belonging, a feeling that members attribute importance to each other and to the group, and a shared belief that the members' needs rely on their determination to be together (McMillan & Chavis, 1986). Rheingold (1993, p. 5) defines virtual communities as "social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace." Jones (1997) puts forward a number of criteria for an

online environment to be called a virtual community: interaction, number of people communicating, constant membership, and a virtual common public area where computer-mediated communication takes place. Wilson & Ryder (1998, p. 1) emphasizes that the factor distinguishing a learning community from other communities is that a learning community shares "group of people support each other in their learning agendas". In a learning community, everybody should learn and be ready to at least partially participate in activities. Online learning communities trigger interaction, allow for expression, and provide a real and interactive online environment. An online learning community brings together people who do similar research and have similar professional and educational interests. An online learning community is a virtual environment where people come together for learning (Bell, 2005).

In addition, a review of the literature about learning communities reveals that there are studies on increasing the sense of online community and studies on variables that affect or are affected by the sense of community. It can be observed that the researches on the sense of community consider such variables as the type of communication tool (synchronous, asynchronous); the use of wiki (Johnson, 2010), blog (Tang & Lam, 2014), twitter (Fife, Nelson, & Clarke, 2014) and podcast from web 2.0 tools (Ferguson, 2010), and other variables such as age (Smith, 2008), gender (Smith, 2008), interaction strategy (Guanying, Zheng, & Juping, 2013), course length (Davis, 2005), type of personality (Daughenbaugh, Ensminger, Frederick & Surry, 2002), learning style (Fearing & Riley, 2005; Smith, 2008), proximity of the teacher (Baker, 2004), student satisfaction (Ilgaz & Aşkar, 2009), intercultural differences (Yum & Hara, 2005), viewing friend's photo (Glisan, 2008) development of learning communities (Yuan & Kim, 2014). While the contribution made here by individual characteristics is noteworthy at this point, it has not been studied sufficiently. The interaction that takes place in online learning communities through sharing encourages students to help each other in solving common problems by connecting them to each other (Palloff & Pratt, 1999). During the process of solving a problem, the needs of individuals are diversified based on the type of locus of control.

### 2.3. Problem based learning

Problem Based Learning (PBL) was first developed in medical education in 1950s. After its successful implementation in various fields of medical education, PBL has become increasingly popular across disciplines in higher education and K-12 education (Barrows, 2000; Dochy, Segers, Van den Bossche, & Gijbels, 2003; Hmelo-Silver, 2004). PBL differs radically from traditional teaching styles in that it centers on "problem first" learning, rather than the more usual "subject first" way using scenarios to illustrate previously taught material. The leader of a PBL program acts as a facilitator rather than a teacher, using their expertise not primarily to transmit facts, but to provide encouragement and guidance as the participants tackle the problems they have identified (Maudsley, 1999).

It differs from more "traditional" approaches to teaching in that the participants are encouraged to use self-directed learning skills (Blumberg & Michael, 1992; Dolmans & Schmidt, 1994; Woods, 1996), problem solving skills (Gallagher, Stepien, & Rosenthal, 1992; Lohman & Finkelstein, 1999; Norman & Schmidt, 1992), and higher order thinking (Hmelo, 1998; Schlundt, Flannery, Davis, Kinzer, & Pichert, 1999). The evidence suggests that PBL is an instructional approach that offers the potential to help students develop flexible understanding and lifelong learning skills. As an alternative to traditional approaches in prospective teacher training, online PBL offers a more effective opportunity for learning. Online PBL is considered to be an effective pedagogic learning strategy that improves prospective teachers' creative thinking, self-regulated learning and self-assessment skills (Yoon, Woo, Treagust, & Chandrasegaran, 2014).

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