



2nd International Conference on Higher Education Advances, HEAd'16, 21-23 June 2016,
València, Spain

Analyzing the effects of the personality traits on the success of online collaborative groups

Seyma Kucukozer-Cavdar^{a*}, Tugba Taskaya-Temizel^a

^a*Department of Information Systems, Informatics Institute, Middle East Technical University, Ankara, Turkey.*

Abstract

The purpose of this study is to analyze how efficient online study groups can be formed among students based on their personality traits. A survey consisting of Ten Item Personality Inventory (TIPI) was conducted among the undergraduate students in a well-known university. Eighty-two students who did not know each other were assigned to 35 small online groups based on their personality characteristics. The group members were then asked to study collaboratively on a task by communicating via the university's learning management system (LMS) forums. It was found that other factors (such as gender) were more effective than personality traits on the group success, and groups with lower degrees of Emotional Stability scores obtained higher grades over the task. This study is one of the first examples that hierarchically show different factors affecting the success of online groups with data mining techniques. The findings of the study will contribute to the field of online collaborative learning that is one of the most prominent subject in distance education.

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Peer-review under responsibility of the organizing committee of HEAd'16

Keywords: online collaborative groups; online group success; personality traits; data mining.

1. Introduction

Collaborative online learning is a type of computer-based learning (Bernard & Rubalcava, 2000; Ku, Tseng, & Akarasriworn, 2013), and it has been seen as one of most effective approach of distance education by researches since 1990s (Eklund & Eklund, 1997). The number of online courses, online collaboration platforms and participants in the

* Corresponding author. Tel.: +90-312-2107716; fax: +90-312-2103745.
E-mail address: kseyma@metu.edu.tr

last decade have been rapidly increased. According to Allen and Seaman (2009), online registrations have been growing faster than campus registrations. These bring about challenging problems with respect to online study group formations in computer supported collaborative learning (CSCL) domain. Several researchers stated that members who are socially familiar or emotionally bonded can work as a team more easily than who do not (Janssen, Erkens, Kirschner, & Kanselaar, 2009; Lee, Bonk, Magjuka, Su, & Liu, 2006; Stark & Bierly III, 2009). However, unlike in face to face classes, students in online classes usually may not have any opportunity to know each other very well. As a consequence, it may be difficult to form effective online collaborative groups in an unfamiliar environment (Brindley, Blaschke, & Walti, 2009).

Many studies investigated how to form study groups while taking into account diverse aspects of students such as their cognitive abilities (Chen & Macredie, 2002), personality characteristics (Chen & Caropreso, 2004), or emotional intelligence levels (Berenson, Boyles, & Weaver, 2008). When forming virtual (online) groups, social aspects of group members is one of the criteria that should be considered in order to increase the efficacy of groups. When forming virtual (online) groups, social aspects of group members is one of the criteria that should be considered in order to increase the efficacy of groups. Muehlenbrock (2006) stated that group quality can be increased by forming groups according to students' profiles and user-context information. Additionally, several studies such as Pieterse, Kourie, and Sonnekus (2006) showed that similarity or diversity on the personality of team members affects group success. The results of the recent studies such as Luse, McElroy, Townsend, and DeMarie (2013) showed that personality characteristics of the participants in virtual groups affect group performance.

Specifically, the relation between personality traits (Big Five Personality Traits) and group performance was investigated in several studies. For example, a positive relationship was found between Extraversion level and group performance (Baer, Oldham, Jacobsohn, & Hollingshead, 2008; Hórreo & Carro, 2007; Rhee, Parent, & Basu, 2013; Thoms, Moore, & Scott, 1996). Agreeableness levels were found positively related to group performance (De Dreu & Van Vianen, 2001; Peeters, van Tuijl, Rutte, & Reymen, 2006). Conscientiousness was considered as the most related trait in both individual and group success (Peeters et al., 2006) since conscientious individuals are described as hard-working, self-disciplined, and reliable. The researchers showed a positive relationship between conscientiousness levels and group performance (De Dreu & Van Vianen, 2001; Peeters et al., 2006). Emotional Stability (or reversely Neuroticism) was also investigated, and a negative relation between the Emotional Stability and group performance was found (Peeters et al., 2006; Rhee et al., 2013). Finally, Hórreo and Carro (2007) showed that heterogeneous groups based on Openness got better results than homogeneous groups, and Baer et al. (2008) found the level of Openness was positively related to the group performance.

The main purpose of this study is to investigate how efficient small online study groups can be formed based on personality characteristics. Two main hypotheses were developed and investigated not only with statistical tests but also with data mining techniques (namely decision tree fit). Unlike other studies in the literature, this study investigates online collaboration of students who do not know each other and study in different faculties. Other factors (such as gender) that affect online group success were also explored and showed in a hierarchical way according to their impact. The method used in this study (decision tree fit) has not been used in previous studies.

2. Methodology

The study consisted of two main steps: (1) *Pre-study survey*: It was designed to measure the personality traits of the students. The Turkish version of Ten Item Personality Inventory (TIPI) was applied in the pre-study survey, and (2) *Online study on a learning management system*: The students worked in small online groups which were formed based on their personalities. There were two types of groups in the study: homogeneous or heterogeneous based on the personality traits of the students. The students communicated through an online forum of a learning management system (LMS).

In this study, a causal-comparative design was used since the differences caused by the personality of individuals were investigated and they were not manipulated (Schenker & Rumrill, 2004). In addition, quantitative research methods were utilized for identifying the personality traits of the participants. As the population of the study, the undergraduate freshman students who were registered to an introductory service course about information technologies in a well-known university were chosen. This course was selected for the study as it is mandatory for several departments in the university and the scope of the course is very applicable to study on an online platform.

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