Transactional Distance in MOOCs:
A Critical Analysis of Dialogue, Structure, and Learner Autonomy

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Abstract: Drawing upon a content analysis of students' postings on CourseTalk.org, this study presents preliminary findings of analyzing transactional distance in xMOOCs in order to elucidate the educational exchange facilitated or restricted with reference to the three variables of transactional distance theory.

Introduction

The disruptive capabilities of massive open online courses (MOOCs) could have significant implications for a wide array of educational practices, including adult education, if extensively adopted. As MOOCs have dramatically expanded, they have also triggered heated debate about their functionality and pedagogical value. Some argue that MOOCs extend access to quality higher education to populations who cannot afford to participate in traditional face-to-face higher education, whereas others are skeptical, arguing that, given the high dropout rates of MOOCs, they are nothing but a marketing strategy (Conole, 2013). It is also widely observed that the modalities of MOOCs' design have been adapted in various ways to specific educational goals and environments. Whether those courses are considered massive or midsize courses, synchronous or asynchronous education, formal or informal learning, or professional development or education, a defining aspect of MOOCs is that they all fall under the broad umbrella of distance education (Daniel, 2012). Yet MOOCs distinguish themselves from other distance education credit courses by offering massive online enrollments and open participation to students from across the globe. The speed at which MOOCs have entered the adult and higher education market is remarkable, and advances in communications technology have allowed MOOCs to utilize the current infrastructure adapted by other distance education systems.

A variety of seemingly promising functionalities of MOOCs have influenced the growing number of participants, including learners worldwide and instructors from many higher education institutions (Waldrop, 2013). Nevertheless, as reported in the media and as experienced by the authors of this paper, they also typically entail numerous educational issues and/or problems, such as limited interaction between the pedagogical subjects (i.e., instructors and learners) as well as the overuse of mechanical applications, such as automated grading. Distance education scholars have questioned the value of MOOCs in terms of their effectiveness for higher education pedagogy (Larry, 2012), retention of learners (Meyer, 2012), sustainability (Yuan & Powell, 2013), and social role in expanding educational opportunities (Ho et al., 2014). Additionally, there have been a number of critical discussions about MOOCs, many of whose primary focus has been on the modalities and purposes of MOOCs (e.g., Daniel, 2012).

In order to more fully understand how MOOCs operate as online distance learning events, we must examine students' learning experiences in MOOCs through the widely accepted theories and models of distance education and online learning. In particular, it is pivotal to further explore the educational transaction, or exchange, between learners and instructors and/or among learners themselves on a theoretically congruent basis to analyze the effectiveness of

MOOCs at a deeper level. Given the vast number of adult learners enrolled in MOOCs, questioning the validity and reliability of the MOOC pedagogy in light of the seminal distance education theory of transactional distance (Moore, 1993) can allow us to gain profound understanding of how to view MOOC pedagogy from a distance education perspective.

Overview of Transactional Distance Theory

Moore (1993) defined transactional distance as "a psychological and communications space to be crossed, a space of potential misunderstanding between the inputs of instructor and those of the learner" (p. 23). The theory of transactional distance offers a framework for the exchange of knowledge and ideas (dialogue), where the structure of a course as well as the distance learners' autonomy influences the exchange (Moore, 1993). It is notable that the concept of transactional distance denotes the psychological, rather than physical, distance among the pedagogical subjects. One of the fundamental theoretical implications of transactional distance is that an educational exchange among the pedagogical subjects, which is facilitated by educational mediations, can reduce miscommunication or psychological disconnection so that the exchange can lead to an effective educational transaction (Shearer, 2009).

At a macro level, transactional distance theory helps us explicate how the three variables interact in the context of distance education (Shearer, 2009). As discussed by Moore (1993) and supported by Saba and Shearer (1994) and Shearer (2009), transactional distance or psychological separation is diminished when dialogue is high and structure is low. However, in instances in which learners are highly autonomous, low dialogue does not necessarily exacerbate the transactional distance. These relationships imply that a high level of dialogue may not always be required by autonomous learners for effective learning. The relationships among the three variables are visualized in Figure 1 below.
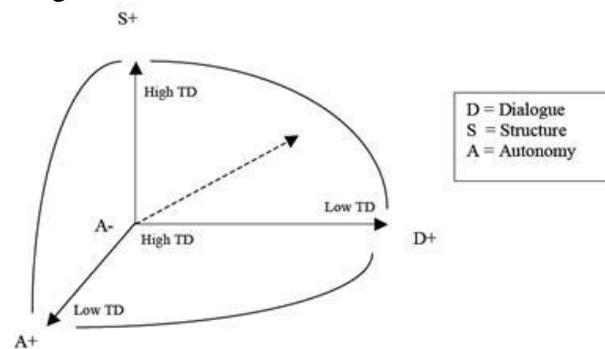
<Figure 1> Three dimensions of transactional distance (Shearer, 2009, p. 17)

In a nutshell, the theory of transactional distance concerns the pedagogical phenomenon of interaction between teachers and learners, or among learners themselves in the distance educational context, primarily influenced by various relationships between dialogue and structure. The structure consists of course design elements, such as learning objectives, activities, assignments, and assessments, whereas dialogue refers to the meaningful communication between the pedagogical subjects. Moreover, the theory accounts for the importance of autonomy, which is a learner characteristic indicating the learner's degree of self-control or -management of his or her learning (Moore, 1993; Shearer, 2009). The theory thus allows us to elucidate how relations among the three fundamental variables in distance educational settings can "describe the extent to which course components can accommodate or be responsive to each learner's individual need" (Moore & Kearsley, 1996, p. 200). The three variables of the theory—

dialogue, structure, and learner autonomy—are the fundamental theoretical bases on which a number of distance education research studies have been conducted (e.g., Saba & Shearer, 1994; Stein, Wanstreet, & Calvin, 2009).

The Study

MOOCs appear to relate generally to the theoretical foundations of transactional distance. However, the massive and open aspects of participation in MOOCs complicate the validity and reliability of the transactional distance in MOOCs. The unique dynamic of the pedagogical processes and outcomes of MOOCs raises some fundamental questions: How can we approach the relationships among dialogue, structure, and learner autonomy in the environment of MOOCs through the conceptual lens of transactional distance theory? What pedagogical design components can be supported within the context of massive and open enrollments? Alternatively, what aspects of MOOCs complicate the three variables of transactional distance theory, and how do these complications lead to critical discussion of the MOOC phenomenon in this era of dynamic distance? These questions have been unanswered by the current literature of distance education and MOOCs.

Given the fast-changing landscape of MOOCs and the variety of MOOC formats, it is necessary to narrow the research context in order to explore answers to the questions above. The most prevalent criterion used to categorize MOOCs is pedagogical design, whereby a variety of MOOCs can be categorized as cMOOCs (or connectivist MOOCs) or xMOOCs. In practice, the most salient distinction between the two types of MOOCs is that cMOOCs run on multiple sites with expanding learning contents, whereas xMOOCs operate primarily on a single platform. In other words, while cMOOCs are designed in massive networks (Downes, 2008; Siemens, 2012), xMOOCs, mostly offered by elite U.S. institutions, are based primarily on the behaviorist approach to distance education pedagogy (Rodriguez, 2013).
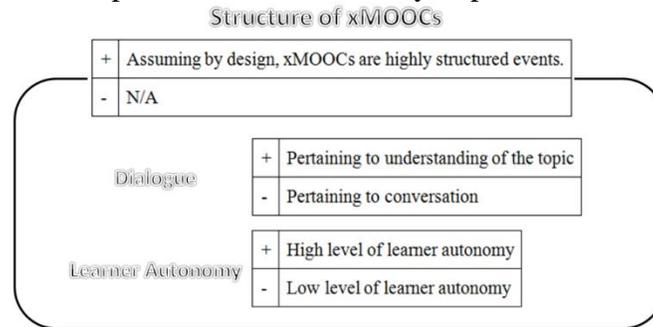
This study documents preliminary findings of a content analysis of students' postings on CourseTalk.org, examining comments only in the category of Coursera. CourseTalk is self-described as "a comprehensive search of MOOC's and open enrollment courses freely available to anyone. Through the site, students can enroll in programs, communicate with professors and other students and rate & review courses (wwwcoursetalk.org)." Because the research is still in progress, only the analysis scheme and an example of preliminary findings are reported here. The original study aims (1) to explore how the theory helps us to understand the pedagogy of xMOOCs and (2) to discuss potential pedagogical issues that the design (or structure) of xMOOCs inevitably results in. The following research questions inform the study:

- **Learner Autonomy:** What level of autonomy or self-directed learning must a learner have to be successful in a MOOC?
- **Structure:** Do students adhere to the structure of xMOOCs, or do participants break away from the structure and form self-organizing subgroups?
- **Dialogue:** Given their massive nature and extremely high ratio of students to professors, we might assume a low level of dialogue, as defined by Moore (1993) and Shearer (2009), with the instructor. But do we actually see rich dialogic exchanges in self-organizing learner groups?
- **Transactional Distance:** Given the exploratory answers to the questions above, how can we determine the transactional distance between instructors and learners in MOOCs? What are its implications for adult and distance higher education?

Methodology

The method used to investigate transactional distance in MOOCs is content analysis, which is defined as "a research technique for the objective, systematic, and quantitative description of the manifest content of communication" (Borg & Gall, 1989, p. 357). The research team reviewed user comments in the postings on CourseTalk (www.coursetalk.org) to analyze students' experiences and perceptions of transactional distance in a representative xMOOC platform: Coursera. CourseTalk is a web space where learners of MOOCs can connect with each other and share their social and interactive user experiences. The preliminary research using the content analysis includes 125 courses and 411 postings.

The first step in our research was to develop a set of categories into which parts of student comments were coded. The three variables of transactional distance theory provided the criteria for our categories. Based on the theoretical framework of the three dimensions of transactional distance (Shearer, 2009, p. 17), we attempted to operationalize each dimension as shown in Figure 2 below. In this initial phase, a set of descriptions and indicators were identified, and examples were selected to present the content analysis processes.

Structure of xMOOCs

+	Assuming by design, xMOOCs are highly structured events.
-	N/A

Dialogue

+	Pertaining to understanding of the topic
-	Pertaining to conversation

Learner Autonomy

+	High level of learner autonomy
-	Low level of learner autonomy

<Figure 2> Initial coding scheme

The second step involved a systematic process of assigning data (phrases or sentences in the postings) to categories. We began by sorting out segments of the postings indicative of one of the three variables. For instance, if a student posted "limited communication," or "TA was helpful for the discussion," such phrases were coded as indicators of dialogue. Furthermore, when a student characterized herself as a certain type of learner by stating, "prefer to follow the given procedures," the sentence was coded as an indicator of learner autonomy. Although the structural features of courses were coded in this phase as well, xMOOCs were assumed to be highly structured events in terms of their learning design, given their preset learning contents, assessments, communication channels, and so on. Additionally, the majority of xMOOCs have specified start and end dates as well as a specific learning path through which the learner progresses. Once these screening and allocating processes were complete, we judged whether each indicator represented a negative or positive conception in the Dialogue and Learner Autonomy categories. A significant process in assigning data to categories was determining the unit of analysis (Henri, 1991). As this study aims to comprehensively understand transactional distance in MOOCs at the macro level, our analysis was based upon nonthematic units of each student's posting. In order to make our coding procedure clear and transparent, interreliability was measured by means of Krippendorff's alpha.

The third step in our analysis was to identify the characteristics of transactional distance in MOOCs by creating thematic conceptions. The collection of indicators was used to describe the patterns and the features of transactional distance in MOOCs. Categorizing key descriptors

helped us understand major factors that affect the alleviation or consolidation of transactional distance in the context of xMOOCs.

Research on learner experiences is always limited—whether by language, perceptions, or some other factor. There is no way to purely access a learner experience. At the same time, it is also important to acknowledge the ways in which this particular exploratory study accesses learners' experiences in a uniquely mediated way. The research team is not speaking directly to learners about their experiences. Nor is content from MOOCs directly assessed to ascertain learner experiences. This method is the nature of any social media research and is both its inherent strength and weakness.

Preliminary Findings and Implications

In this preliminary analysis, it was found that students' experience of dialogue with the instructor or other students was generally limited to the conversation level. Eighty-five percent of indicators in the Dialogue category imply that they pertained to surface-level communications, such as mere discussion of learning process itself, instead of collaborating on profound knowledge building. Students' expectations about active interaction and deep communication were low, which was not surprising given the highly structured nature of xMOOCs for massive education. Despite the low dialogue, students scarcely indicated that the less facilitating educational environment was a problem. This finding could be due to the characteristics of the students that this research included. Students rarely characterized themselves as passive learners; rather, most of the students on CourseTalk.org completed a course and voluntarily provided their reflections, in contrast to the many dropouts. This finding indicates that having less dialogue did not aggravate the transactional distance for the learners in this study because they were highly autonomous. This finding reaffirms the theoretical assumption of transactional distance theory.

To this end, this study intends to investigate how transactional distance theory provides meaningful insight into the mechanisms of MOOCs. The three theoretical constructs and their relationships in the context of MOOCs were revisited in order to draw implications for MOOC pedagogy. While MOOCs are based upon large-scale and inexpensive course provisions developed from distance education technology (Batson, Paharia, & Kumar, 2008), we should consider that the highly structured approach to MOOC course design, especially in xMOOCs, might not lead to profound dialogue among participants, which is key to successful higher education and a reduction in transactional distance (Shearer, 2009). Additionally, it is also possible that the huge variety of perspectives, age ranges, nationalities, student statuses, and professional backgrounds leads to deeper, more meaningful dialogue among learners. While we may witness full-fledged learner autonomy in MOOCs, it is unclear whether participants/learners are reaching a deep level of critical thinking through the present technology-driven structure of MOOCs. Regarding the pivotal elements of distance education, this exploratory study highlights potential pedagogical problems that MOOCs inevitably face in fostering deep learning experiences.

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