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## From Instructivism to Connectivism: Theoretical Underpinnings of MOOCs

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# FROM INSTRUCTIVISM TO CONNECTIVISM: THEORETICAL UNDERPINNINGS OF MOOCs

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## ABSTRACT

While the first MOOCs were connectivist in their approach to learning, later versions have expanded to include instructivist structures and structures that blend both theories. From an instructional design standpoint the differences are important. This paper will examine how to analyze the goals of any proposed MOOC to determine what the epistemological focus should be. This will lead to a discussion of types of communication needed—based on analysis of power dynamics—to design accurately within the determined epistemology. The paper also explores later stages of design related to proper communication of the intended power structure or theoretical design as these relate to various activities and expectations in the MOOC.

**Keywords:** MOOC, instructivism, connectivism, constructivism, power dynamics, zone of proximal development, pedagogy, andragogy, heutagogy, learning and teaching as communication actions (LTCA), normative communication actions, strategic communication actions, constative communication actions, dramaturgical communication actions

# **FROM INSTRUCTIVISM TO CONNECTIVISM: THEORETICAL UNDERPINNINGS OF MOOCs**

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## **INTRODUCTION**

When determining the need for a new course, many educational institutions think about factors such as demand, necessity, costs involved, and other standard concerns. This analysis phase generally will include analyses such as a needs assessment or a skills test to determine what content the course should cover. MOOCs offer a unique challenge in this area in that a larger number of learners can enroll, often coming from outside the typical population an institution is accustomed to serve. How does one perform a needs assessment or test skills of a sample learner population for the first offering of the course when the whole world constitutes the pool of potential learners?

The analysis phase of designing a MOOC is often left up to the professional opinion of those who want to offer a MOOC covering a particular topic. Professionals in a given field begin to notice certain patterns and eventually conclude that a MOOC would be an interesting avenue to explore. Should this be the end of the analysis? Does such a limited analysis provide course designers with information about all the factors that careful MOOC design must take into account? One can argue that, as the various formats of MOOCs diversify, MOOC designers need to consider several largely ignored factors before they begin designing a course.

To this end, this article will examine some important theoretical underpinnings of course design that affect MOOCs. Areas to be covered include epistemologies, methodologies, communication goals, and power relations inherent in each. These theoretical areas of concern often involve people who take sides, advocating for competing perspectives and approaches to MOOC design. The popularized cMOOC versus xMOOC debate exemplifies such a case of polarized advocacy. Without assuming one side is better than the other, this article will examine the various aspects of theoretical perspectives and the power of those perspectives to help designers analyze design attributes that are appropriate for various educational goals.

## **THE BASICS OF ANALYSIS**

Although this article will cover a lot of theoretical ground, a theory-based analysis of MOOC design does not have to be time-consuming. Before jumping into

specific theories and ideas, an examination of the overall process is in order. Keep in mind that an initial MOOC design analysis can start off as a “rough draft” that is updated and revised as the course is developed. The analysis process would look like this (see Appendix A for a sample worksheet that might be helpful):

1. *Determine the main epistemological focus of the MOOC.* There can (and probably will) be elements of all epistemologies in the course. Conversely, most courses tend to operate with one underlying power structure to guide design and development. Power structures can be seen as a guide for epistemology, but they should not be confused as being the same the thing.
2. *Decide the main methodology that will be utilized in the design.* Again, there will be elements of all, at times, but knowing the main underlying methodology will help guide the course design analysis.
3. *Look at what types of interaction are desired for the course.* For this stage of analysis, there might be one main type of interaction, or several.
4. *Begin matching the types of interaction with the epistemological and methodological design of the course.* Some types of interaction may fall outside of the main epistemology and methodology of the course and that is fine, as long as the designer makes sure to take note. Designers who lean towards a power structure or design method that is different from those initially chosen might consider going back and revising those choices.
5. *Map out what kind of communicative actions will be needed for each activity based on course epistemology and methodology (or outlying epistemology and methodology, as needed).*

Consider a course on changing trends in the healthcare industry as an example to take through this analysis. (Note that the technical terms in italics, below, will be explored later in the article.) For this healthcare course, the course designer has decided that a connected learning approach (*connectivism*) is the best overall epistemology because the course topic covers “changing trends.” Learners would be well served to form a network of resources that will keep them up to date on an ever-changing topic. For the purpose of this course, spending large amounts of time learning current information would not be helpful when that knowledge itself will be obsolete in a year. The course topic involves a mix of expert knowledge and life experience; therefore the designer chooses a methodological focus (*heutagogy*) that encourages participants to learn how to be learners. Bringing these two analyses together, the designer determines that the course needs to be designed in a *connectivist heutagogical* manner. This determination impacts all subsequent design decisions, including course communications patterns. Instead

of forming students into course-specific groups that might not exist after the course, the designer focuses on leveraging network interactions for course activities. Some of these interactions are *student-student* interactions; others are *student-interface* interactions. Therefore, the course designer decides that *normative communicative actions* must occur in order to explain what is happening in the course. Moreover, some *strategic communicative actions* will help learners who might need guidance on how to network. The goal of these normative and strategic communicative actions will not be to look at facts, but rather to encourage students to network with others for the purpose of learning how to be well-connected to other learners and learning objects related to ever-changing health trends. However, the course designer also realizes that the MOOC confers a certificate of completion and therefore determines the need for some kind of final assessment that authorizes granting the credential. The designer decides to add an assignment at the end that utilizes the construction of learned experiences in the form of a blog reflection (a *constructivist andragogic* approach). This would require some *normative communicative actions* to explain the assignment followed by the learner producing *dramaturgical communicative actions* that express how they have integrated what they learned in the course with their existing knowledge.

This example highlights one possible combination of the various theories and ideas that affect course design. The goal of this article is to examine many of these theories, as well as lay out a simple plan for determining the factors that should guide MOOC design. The first area of MOOC analysis to be examined will be the overall power dynamics that determine who controls the content and activities and what that means for the design phase of MOOC creation.

## **EPISTEMOLOGY: POWER DYNAMICS IN LEARNING**

One of the more basic concepts to affect society and by extension the institution of formal education is who controls power in educational settings. For the purpose of this article, power is defined as “the capacity of one party (the agent) to influence another party (the target)” (Yukl, 2006, p. 146). Jurgen Habermas (1971) connects power with education and knowledge when he writes about the various types of knowledge that exist in society. As will be examined, the types of knowledge Habermas identifies match up with what Anderson and Dron (2011) call the three generations of distance education pedagogy: cognitive-behaviorist, social constructivist, and connectivist pedagogy.

One type of knowledge that Habermas (1971) focused on was instrumental knowledge, basic knowledge that humans need in order to survive and attempt to control their own environment. In education, the transmission of instrumental knowledge is often referred to as instructivism. Instructivism is a general idea that “assumes the effectiveness of passive reception of sanctioned information through

memorization and recall” (Porcaro, 2011, p. 40). Some of the bigger ideas associated with instructivism are behaviorism (as explained in the work of Skinner and Thorndike) as well as cognitivism (as defined in the work of Gagne and Bruner). While these may seem to be very diverse positions, “instructivists, whether behaviorist or cognitivist, are ontologically objectivist and realist, and epistemologically empiricist.... they see learning as simply mapping the real, external world on to the minds or behaviors of the student” (Porcaro, 2011, p. 41). The main idea to focus on in all of this is that power in instructivism is external to the learner—usually residing with an expert instructor. This means that the instructor has established power that must be transferred to a learner.

Another type of knowledge that Habermas (1971) focused on was communicative knowledge, which is a type of knowledge that concerns our ability to interpret and negotiate understandings of the world with those around us. In education, this process of interpretation and negotiation is often referred to as constructivism. Constructivism is also a diverse idea that is “well-suited for teaching the epistemic practices and collaborative problem-solving skills necessary in a knowledge society while empowering learners through democratic participation in learning and dialogue” (Porcaro, 2011, p. 43). Among many strains of constructivist theory, two of the most important are cognitive constructivism (found in the work of Piaget) and sociocultural constructivism (found in the work of Vygotsky). One of the more well-known ideas to arise from constructivism is Vygotsky’s Zone of Proximal Development (ZPD). The ZPD constitutes the distance between what a learner knows and what that learner can come to know when guided by a more knowledgeable other (Vygotsky, 1978). While this understanding of learning shifts some power to the learner, the ZPD still resembles a typical formal learning situation wherein learners are dependent on experts who hold the power.

One can argue that none of the learning theories discussed above describe learning that occurs when multiple experts connect to learn together. Many modern learning situations are brought about when a collection of knowledgeable individuals gather to dig deeper into a topic with which many of them are already familiar. To this end, Andersen and Ponti (2014) believe that the ZPD can be seen as existing on two levels: individual and collective. Therefore, another idea is needed to describe learning in environments that involve learners operating with distributed expertise, a dispersion of the power inherent in knowledge. Connectivism encapsulates ideas that underlie learning situations that feature dispersion of knowledge and therefore of power.

When examining behaviorism, cognitivism, and constructivism, George Siemens and Stephen Downes (2005) came to the conclusion that these theories did not address learning that occurs socially as a group (though it might describe learning the individual achieves through interaction with others, as described by

social constructivism). To address this issue Siemens and Downes developed a new theory they referred to as connectivism. According to Siemens (2005)

Connectivism is the integration of principles explored by chaos, network, and complexity and self-organization theories. Learning is a process that occurs within nebulous environments of shifting core elements—not entirely under the control of the individual. Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database), is focused on connecting specialized information sets, and the connections that enable us to learn more are more important than our current state of knowing (p. 6).

Connectivism as a learning theory shifts the power in education away from individuals such as learners and instructors and onto a collective group. Individual work from instructors and learners still exists within connectivism; however, connectivism focuses the network and connections rather than individuals.

Connectivists assume power in learning can be distributed between three different locations: the instructors, the learners, or the network that forms among all participants. Since power is a dynamic aspect of society that shifts and changes, courses should not be seen as instantiating only one power dynamic that is set from the beginning. Courses may have one dominant power structure upon which most of the course is based (for example, “student-centered learning”), but other power structures may also exist at the same time for different aspects of learning or at different times in the learning sequence. Nevertheless, designers must understand what main power structure they desire for a course as an important first step in the analysis of a new course design, a topic that will be examined closely in the next section.

## **ANALYZING MOOC GOALS FOR POWER DYNAMICS**

While all design decisions with any course are important, the decision about epistemological power structures can be one of the foundational decisions that guides everything from activity and content design to tool choice. However, an important distinction to keep in mind is that there are no hard, fast lines between instructivism, constructivism, and connectivism. Courses that focus on the instructor as content source can also have elements of interaction and connectivism. In like fashion, connectivist courses can also contain content that positions the instructor as knowledge expert. The important factor to determine in this area is where the main power of the course resides: with the instructor, the learners, or the network.

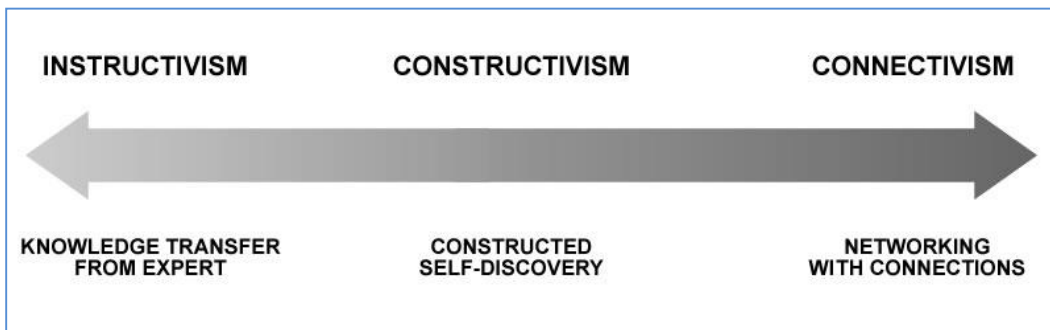
To this end, the course designer needs to take a preliminary look at the goals and objectives of the MOOC under design, and look at the competencies learners are to master. In some instances, the course may lend itself well to more



than one epistemology. In these cases, the course designer may want to choose a power structure that the instructors are most comfortable with (or even collaborate to stretch instructors' teaching abilities in unfamiliar power relationships with learners). However, there are several clues that may indicate which power dynamic is most appropriate. Some questions to consider are:

- Do learners need to gain knowledge (facts) and/or skills (abilities) by the end of the course?
- How would learners best gain these skills or facts? Through self-discovery, connecting with others, or through transfer from an expert?
- Would learners benefit from interacting with other learners to construct knowledge together (or even by debating various sides of issues)?

In general, the more that learners need to gain knowledge from the instructor, the more a course needs to lean towards instructivism. However, the more those learners can gain from self-discovery and reflection, the more a course needs to lean towards constructivism. Or in other scenarios, the more benefit learners could gain from connections with other learners or networks, the more the course needs to lean towards connectivism. Again, these three paradigms should not be considered mutually exclusive. Rather, in the real world, these paradigms can and do co-exist profitably. They can be thought of as points along a continuum:



In other words, design analysis at this stage should not involve determinations of the “rightness” of competing theories, but should be guided by where course goals fall along the continuum. This unbiased alignment of course goals to epistemology sets the foundation for the design stage. For instance, if analysis suggests the power structure inherent in the learning goals leans toward connectivism, course design would need to include relatively little direct instruction, and would involve more ill-structured problems, interactive exercises, learner-determined activities, and even artifacts based on learner preferences rather than pre-determined structures (such as papers, tests, etc). A course that relies on a power structure that leans toward constructivism would need to include

self-discovery activities, more student-centered learning, problem-based learning, and reflective artifacts such as blog posts. A course using a power structure that leans toward instructivism would need to involve more direct instruction, well-defined problems, guided exercises, instructor-led activities, and artifacts (such as standardized tests and research papers) that follow guidelines determined by the instructors. Of course, many of these activities and designs can be used in power structures other than the power structure that the above writing might suggest is “native” or “natural” to that activity/design.

Typically, many educational commentators and experts refer to MOOCs that lean toward instructivism as xMOOCs (for “MOOC as an eXtension of college”) and MOOCs that lean toward connectivism as cMOOCs (for “connectivist MOOC”). These distinctions are not always absolute, as xMOOCs often have some connectivist characteristics and cMOOCs often have some instructivist traits (although there are also MOOCs that tilt completely toward one or the other extreme). Internet searches for either term could be very helpful in determining which direction a MOOC being designed could lean.

Once the epistemological power dynamic of a course has been determined, other areas of course design fall into place more easily. However, all course designers know that design is rarely a linear process. Further analysis may cause course designers to come back and re-examine the basic power structure of a course. Therefore, the initial decision regarding the predominant power structure appropriate to course goals is to be seen as a preliminary direction open to later modification. The next phase of MOOC design analysis builds on the foundational epistemology/power structure analysis by determining which theoretical design paradigm(s) to utilize.

## **METHODOLOGY: PEDAGOGY, ANDRAGOGY, AND HEUTAGOGY**

In many circles, pedagogy is seen as a blanket statement to describe all teaching methodologies. However, as the contexts for teaching and learning continue to diversify, many are seeing limitations to the term “pedagogy” and have begun to look at other methodologies alongside—or sometimes in place of—pedagogy. In this context,

The pedagogical model is a content model concerned with the transmission of information and skills, where the teacher decides in advance what knowledge or skill needs to be transmitted and arranges a body of content into logical units, selects the most efficient means for transmitting this content (lectures, readings, laboratory exercises, films, tapes, for example), then develops a plan for the presentation of these units into some sequence. Pedagogy is a teaching theory rather than a learning theory and is usually based on transmission.

(McAuliffe, Hargreaves, Winter, & Chadwick, 2008, p. 2)

This definition has many connections to instructivism; however, constructivist and even connectivist learning activities are possible when following a pedagogical methodology. As constructivism and connectivism have gained adherents in the educational world, methodologies different from pedagogy have gained popularity as the means to allow those epistemologies to reach their fullest potential. This section will briefly outline two of the more recent methodologies that offer alternatives to pedagogy.

Andragogy was a term coined and a methodology proposed in the 1960s as a way to distinguish adult education from grade school education (Merriam, 2001). In that context, an adult learner was seen as one who

(1) has an independent self-concept and who can direct his or her own learning, (2) has accumulated a reservoir of life experiences that is a rich resource for learning, (3) has learning needs closely related to changing social roles. (4) is problem-centered and interested in immediate application of knowledge, and (5) is motivated to learn by internal rather than external factors. (p. 5)

Richard Cullata suggests that “[i]n practical terms, andragogy means that instruction for adults needs to focus more on the process and less on the content being taught. Strategies such as case studies, role playing, simulations, and self-evaluation are most useful. Instructors adopt a role of facilitator or resource rather than lecturer or grader” (2013).

As societal expectations of educational systems have changed, many would suggest that the characteristics of learners originally associated with adult learners apply to young learners engaged in grade school education as well. Even though their life experience is more limited, self-motivated junior high students might just as easily benefit from self-directed learning that draws upon their life experiences to examine changing social roles in a manner that is applicable to their own lived experiences. Therefore, andragogy has ties to constructivism in that andragogy assumes and leverages the fact that learners draw upon experience to construct new knowledge that they connect to existing knowledge in ways applicable to real life situations.

Heutagogy is a newer epistemology that combines pedagogy with andragogy to form a modern learning design. Hase and Kenyon (2000) describe heutagogy as looking “to the future in which knowing how to learn will be a fundamental skill given the pace of innovation and the changing structure of communities and workplaces” (p. 2). Blaschke (2012) also states

[i]n a heutagogical approach to teaching and learning, learners are highly autonomous and self-determined and emphasis is placed on development of learner capacity and capability with the goal of producing learners who are well-prepared for the complexities of today’s workplace. (p. 1)

Concepts that are connected to heutagogy include self-directed learning, double-loop learning, non-linear learning processes, and learning how to learn. The main idea behind heutagogy is that learners are not taught *what* to learn, but *how* to become a learner in relation to ongoing learning of a particular topic or skill set.

Most experienced course designers will recognize elements of all three methodologies in almost all classrooms and online courses. However, most courses probably lean heavily on one methodology to the relative exclusion of others, the most common methodology being pedagogy. When analyzing the methodological focus of a new MOOC, it is important to consider how course goals might suggest the best underlying course methodology to adopt, rather than basing the choice of methodology solely on instructor preference. The next section will look at combining power structures with methodology to determine an overall design of a MOOC.

## **ANALYZING MOOC GOALS FOR METHODOLOGY**

Once a designer has determined the epistemological power structure most appropriate to the goals of a given MOOC, the next step is to decide which methodological design theory aligns best with those course goals. If the goal is to pass along formal information about a specific topic (a goal served well through an instructivist epistemology), then pedagogy likely would be the best methodology to adopt. If the goal of a course is to provide learners with experiences that expand upon their existing, informal knowledge (a goal which suggests a constructivist epistemology), then andragogy would be a good matching methodology. If the course goal is to have learners determine how to learn about an evolving topic (likely involving connectivist epistemology), then heutagogy might be the best option as the matching methodology. However, the connection between the design theory and epistemologies may not be as easy to determine as this.

For example, a course on emerging technologies might best benefit from learners learning how to keep up with an ever-changing field. The first thought would be to create a connectivist course through a heutagogical process. For certain advanced learners, this may work out well. However, if the course is expected to draw in a large number of learners that are completely new to the topic, they may need an instructivist approach to learning how to learn about emerging technology. In other words, the main goal would be to take the epistemological power structure that best facilitates comprehension of the topic or gaining of skills and match that up with the methodological design theory that will best help learners accomplish the intended learning goals, objective, or competencies. Therefore, one could possibly end up with nine outcomes, outlined below. Please note that these are general ideas that tend to blend into one another.

<p><b>Instructivist Pedagogy</b> The most common form of education in formal classrooms. Formal learning that depends on the instructor to dispense knowledge that is new to learners. Focused on content, video, standardized tests, papers, and instructor-guided discussions.</p>	<p><b>Instructivist Andragogy</b> A less common form of continuing education. Experienced learners are heavily guided through discussion activities to add to existing knowledge. Instructors guide learners through lessons learned by other experienced people in the field.</p>	<p><b>Instructivist Heutagogy</b> Probably a very unlikely direction to take, but this would basically be an expert sharing information about where to learn about a topic. Contains mostly lists of resources and professional communities that learners can join into to learn more, as well as instructions on how to best interact with resources and communities.</p>
<p><b>Constructivist Pedagogy</b> Here, the goal of learning is for learners to build upon existing knowledge and experiences by formally learning from more experienced others individually or as a group. Another common formal educational design most often seen in reflective classrooms. Instructors create scenarios and activities for learners to reflect on what they know and construct new knowledge in their own ways. Writing, blogging, and reflective activities of all types are most common.</p>	<p><b>Constructivist Andragogy</b> The goal of learning is for learners to build upon existing knowledge and experiences to construct new knowledge either individually or as a group. Probably the most common form of continuing education. Group work, open-ended reflection or discussions, and project-based learning are common types of activities.</p>	<p><b>Constructivist Heutagogy</b> The goal of learning is for learners to construct a way to learn about a topic either individually or collectively as a group. A very complex design that is not often attempted. Ill-structured problem-based learning, open-ended group activities, and web searches focused on how to learn more than what facts to learn about a topic are possible activity types.</p>
<p><b>Connectivist Pedagogy</b> The goal of learning is to work as a network in a formal manner for the purpose of mastering competencies to solve an ill-defined problem as proposed by the instructor. The instructor's knowledge would be the main focus and driving force behind this design.</p>	<p><b>Connectivist Andragogy</b> The goal of learning is to work as a network in an informal manner to accomplish a competency that might be somewhat suggested by the course or instructor, but is ultimately determined by the group and based on expanding upon life experiences.</p>	<p><b>Connectivist Heutagogy</b> The goal of learning is to work within a network to figure out how to become a learner about a topic. The instructor might create the avenue for connections and then become one equal part of the network. Also encompasses the rhizomatic model of education, wherein curriculum is "constructed and negotiated in real time by the contributions of those engaged in the learning process" (Cormier, 2008, p. 3).</p>

In some cases, specific predetermined course activities or outcomes guide the designer's decision regarding the appropriate pairing epistemology/methodology. For example, certain subject areas may require learners to form new knowledge by writing reflectively on life experiences. This would fall into the constructivist andragogy quadrant. Given this fixed overall course design decision, the MOOC designer might decide to construct all or more aspects of the course in constructivist andragogic manner (perhaps considering group work or problem-based learning to help learners build on life experiences with the help of others, for example). The topic of another course might require learners to network with others to find social answers to problems, but the process might be a new one that requires guidance from the instructor. Therefore, the course could be designed in a connectivist pedagogical manner (for example, involving activities in which the instructor guides learners into online networks wherein learners work on social issues).

Again, note that any course will probably drift among different epistemology /methodology combinations. At the early stage of course design analysis the goal is to determine the most common way the new MOOC will serve learners' needs. Since MOOCs are open to all who register, they often draw in learners from very diverse experience levels. Often it is possible to design MOOCs with elements of, for example, instructivist pedagogy for the new learners and connectivist heutagogy for the most experienced learners. Designing with pathways that accommodate the needs of various levels of learners requires substantial planning but is achievable (Crosslin, 2014).

Once a MOOC has a general direction for epistemology and methodology, the final stage to consider before jumping into later stages of design is how to communicate aspects related to various activities and expectations in the MOOC. Improper communication of the intended power structure or theoretical design could lead to learner confusion. Therefore, establishing how information is to be communicated in a MOOC forms the final step in analyzing the basic structure for a new MOOC.

## **COMMUNICATION IN LEARNING**

Most educators would agree with Gavriel Salomon, who wrote in 1981 that "education depends upon acts of communication" (as quoted in Anderson & Garrison, 1998, p.98). However, often little attention is given to communication in the analysis stage of course design. This may be because most educational communication occurs in coursework involving one-way instructivism, transmitting content from the instructor to the learner (Anderson & Garrison, 1998.) Some estimates place this form of communication as the commonly utilized method by 70-90% of university professors (Onyesolu, Nwasor, Ositanwosu, & Iwegbuna, 2013). Anderson and Garrison (1998) point out that

educational communication should take on many other formats, including interactive and collaborative communication modes. Therefore, the analysis stage of MOOC design should seek to examine what types of communication and interaction are optimal for a course that is not well served by instructivist-only communication patterns.

From among the many theories of communication and interaction that inform instructional design, this paper will examine one of many prominent classification systems for interaction in education, as well as one theory that classifies types of communication in education. Other communication issues, including communicating across cultures (Cortazzi, & Jin, 1997), are also important for MOOC design, but fall outside of the scope of this article. Moreover, different theories and classification methods might also work just as well within MOOC design work. The main idea would be to examine how interactions will occur within a MOOC, and to determine what needs to be communicated for accomplishing those interactions, and how to best accomplish that communication. Moore (1989) identified three types of interaction in education: student-teacher, student-student, and student-content. Hillman, Willis, and Gunawardena (1994) expanded on this model, adding student-interface interactions. Four years later, Anderson & Garrison (1998) added three more interaction types to account for advances in technology: teacher-teacher, teacher-content, and content-content. Social constructivist theory does not quite fit into these seven types of interaction, thereby leading Dron (2007) to propose four more types of interaction: group-content, group-group, learner-group, and teacher-group. More recently, proponents of connectivism have posited patterns of “interactions with and learning from sets of people or objects [which] form yet another mode of interaction” (Wang, Chen, & Anderson, 2014, p. 125). Therefore, over time, theorists have proposed twelve types of communication that could potentially occur in a distance education setting such as a MOOC:

- **student-teacher** (ex: instructivist lecture, student teaching the teacher, or student networking with teacher)
- **student-student** (ex: student mentorship, one-on-one study groups, or student teaching another student)
- **student-content** (ex: reading a textbook, watching a video, listening to audio, or reading a website)
- **student-interface** (ex: connectivist online interactions, gaming, or computerized learning tools)
- **teacher-teacher** (ex: collaborative teaching, cross-course alignment, or professional development)
- **teacher-content** (ex: teacher-authored textbooks or websites, teacher blogs, or professional study)

- **content-content** (ex: algorithms that determine new or remedial content; artificial intelligence)
- **group-content** (ex: constructivist group work, connectivist resource sharing, or group readings)
- **group-group** (ex: debate teams, group presentations, or academic group competitions)
- **learner-group** (ex: individual work presented to group for debate, student as the teacher exercises)
- **teacher-group** (ex: teacher contribution to group work, group presentation to teacher)
- **networked with sets of people or objects** (ex: Wikipedia, crowd-sourced learning, or online collaborative note-taking)

Most online courses will contain more than one of these types of interaction. Moreover, the nature of specific instances of each interaction type could be classified as exemplifying one of several different epistemologies. For example, student-teacher interactions could be instructivist if the teacher is giving a lecture, but could be constructivist if the learner is helping to teach the instructor or even connectivist if the student is bringing the teacher into a networked learning experience.

Once the typologies of interaction are determined for a MOOC, the final step before designing course activities would be to determine the form of communication needed to communicate each activity appropriately. For these determinations, Learning and Teaching as Communicative Actions (LTCA) theory provides a strong foundation. LTCA is based on the work of Jurgen Habermas. Warren and Wakefield (2012) describe LCTA theory as a system that governs “the transmission, reception, critique, and construction of communicated knowledge” (p. 101). Current LTCA theory proposes four types of communicative actions (Wakefield, Warren, Rankin, Mills, & Gratch, 2012).

- Normative communicative actions: communication of knowledge that is based on past experiences (for example, class instructions that explain student learning expectations).
- Strategic communicative actions: communication through textbooks, lectures, and other methods via transmission to the learner (probably the most utilized educational communicative actions).
- Constative communicative actions: communication through discourses, debates, and arguments intended to allow learners to make claims and counterclaims (utilizing social constructivism and /or connectivism).



- Dramaturgical communicative actions: communication for purposes of expression (reflecting or creating artifacts individually or as a group to demonstrate knowledge or skills gained).

All of these communicative actions can be matched with various types of interactions, methodologies, and epistemologies depending on the desired outcomes of the MOOC. The design challenge is to select the kind of communicative action that is best for each activity, and then to use that action type to accomplish clear communication. For example, if MOOC design calls for a course debate activity, communicating the parameters of the debate through highly normative communication that suggests the instructor intends to control the process could effectively shut down any debate. On the other hand, debate over a topic that is new to learners might not occur at all if the learners are not given sufficient background knowledge through strategic communication.

## **ANALYZING MOOC GOALS FOR COMMUNICATION**

Analysis of communication and interaction is the phase of design analysis that bleeds into decision-making regarding design details. The designer must consider specific learning activities in order to determine proper types of interaction and communicative actions. The first place to start in analyzing communication is to determine what types of interaction will be occurring most often in a MOOC. Most courses have more than one type of interaction, so this analysis could take the form of a list of several activities instead of determining one “correct” type. The activity that students are to accomplish will determine which of the twelve types of interaction are appropriate for a given learning objective, and most interactive types can be used in all epistemological designs and all methodologies. However, communicative actions are more specific as to the type of learning situation in which they can be utilized effectively. Normative and strategic communicative actions are most suitable for instructivist transfer of knowledge or for explaining directions that guide learners into constructivist or connectivist activities. In pedagogical methodologies, these actions often take the form of learner experiences with lectures and textbooks (strategic) and reference to syllabus instructions (normative). In andragogic methodologies, these actions are typically reserved for creating an atmosphere that encourages learners to share existing knowledge. In heutagogical methodologies, these normative and strategic communicative actions typically operate within instructions designed to guide learners to discover how to be learners in a specific context. Constative communications support discourse and debate, most commonly in constructivist or connectivist designs. In pedagogical methodologies, the instructor would guide constative actions in order to bring students to a pre-determined conclusion or to support knowledge transfer. In andragogic methodologies, constative actions

would be designed to allow learners to use existing knowledge to guide discourse. In heutagogical methodologies, constative actions would be designed to help learners create their own learning experience out of debate. Dramaturgical communicative actions support artistic expression by groups or individuals. In pedagogical methodologies, the instructor would determine the form of expression. In andragogic and heutagogical methodologies, the learner would determine the form of expression.

Consider a new MOOC that covers an emerging idea in a specific field. Assume that, through design analysis, the course designer has determined that instructivism is the best governing epistemology for the course, and has determined that pedagogy is the best primary methodology. Given these design analyses, course activities would be based on student-teacher interactions, but also likely would involve some teacher-group guided group work debates. This course would then require normative and strategic communicative actions for the instructivist pedagogical student-teacher interactions, as well as a mixture of some normative with mostly constative communicative actions for the instructivist pedagogical teacher-group interactions. At the end of the MOOC, the designer might decide to mix it up a bit and add a constructivist andragogic student-interface interaction wherein students would use dramaturgical communicative actions to reflect in a blog-type entry on the connections between their own professional experiences and what they have learned in the MOOC. Clarifying to this level of detail in the analysis stage forms a road map that clarifies and simplifies course design immensely. As noted earlier, the worksheet provided in Appendix A could be helpful in organizing these various ideas into a coherent design document.

## **CONCLUSION**

The goal of this article is to start an investigation into theoretical ideas not often considered in the course design process. The analysis procedure described is not exact science. The hope here has been to provide some guidelines to help MOOC designers think through the various aspects of course design through useful theoretical lenses. Many of the ideas and concepts covered here have been greatly simplified, and no doubt experts in those fields would point out important nuances that are omitted here. Designers will want to conduct their own research to gain deeper understanding of the rich theoretical positions touched upon in this article. MOOC designers who apply the design analysis method proposed are encouraged to re-order, re-mix, or re-think any part of the process that does not fit the parameters of their design work, and are further encouraged to report outcomes and innovations to the growing community of MOOC designers.

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**APPENDIX A: MOOC DESIGN ANALYSIS WORKSHEET**

1. Main epistemological power structure (circle one)

*Instructivist*

*Constructivist*

*Connectivist*

What is the main reason for this selection?

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What other power structures could also possibly be part of the course design?

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2. Main methodological structure (circle one)

*Pedagogy*

*Andragogy*

*Heutagogy*

What is the main reason for this selection?

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What other methodologies could also possibly be part of the course design?

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3. Main types of interaction (from the 12 types of interaction)

*Interaction*

*Epistemological and Methodological Match*

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4. Activity and Communicative Actions Map

*Activity*

*Communicative Action*

*Epistemological and Methodological Match*

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*(add more as needed)*

# AUTHOR BIO

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