

# MOOC INSTRUCTIONAL DESIGN PRINCIPLES ENSURING QUALITY ACROSS SCALE AND DIVERSITY

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It is possible to maintain access and cost-effectiveness afforded by MOOC education offerings while completing the education iron triangle (Daniel, Kanwar, & Uvalić-Trumbić, 2009) that requires pedagogical quality as well.

We suggest that not all current higher education delivery processes are well-designed and that not all MOOC delivery frameworks are new or improved learning opportunities. Davidson (2012) suggests that "far too many of the MOOC's ... use talking heads and multiple-choice quizzes in fairly standard subject areas in conventional disciplines taught by famous teachers at elite universities." According to Keller (2008) and many other writers, changes in technology "constitutes [sic] the most consequential set of changes in society since the late nineteenth century, when the nation went from a largely domestic, rural, agrarian mode of living to an industrial, international, and urban economy" (Preface xi). Consequently, for higher education, "this set of circumstances is going to force all academic enterprises to rethink their place and purpose not just in philosophical terms but in very pragmatic ways as well." (Beaudoin, 2003, p. 520). These philosophical and pragmatic changes also affect teaching practice and the role of teacher.

Overton and Burkhart (1999) are optimistic about the adaptive capacity of educational institutions based on past successes. However, they state "the survivability of higher education depends on two essential adaptive conditions:

1. The capacity to remain seriously and directly engaged in the society to be served, particularly in periods of significant change, and
2. The capacity to lead; that is, to adapt, interpret, interface, and influence the societal-institutional interaction" (pp. 217-218).

MOOCs afford us the opportunity to take the lead in supporting broad education in society, by providing public education of high quality knowledge. What won't work is offerings high quality knowledge without attention to high quality pedagogy.

## DATA COLLECTION AND ANALYSIS

Interview questions were designed to create the opportunity for faculty with at least 3 years of online teaching experience to review then instructional purpose and design principles that they feel on critical for MOOC learning environments.

## FUTURE WORK

This is a likely extension of the teaching model used in lectured-base delivery in place-based institutions. It is unrealistic to expect the MOOC initiative to contribute to the higher education without careful reference to existing instructional design requirements in regular online design and delivery. Much of the accolades provided for MOOCs are general attributes of online learning. Like any online education, MOOCs can:

1. increase access,
2. foster equity in the learning environment as it is color and gender blind and class neutral
3. create affordable, convenient learning opportunities, and
4. develop expanded learning skills for students related to self-direction, self-regulation and collaboration.

Online opportunities can provide quality education to an increasing audience previously left-out of elitist, geographically-bound and expensive place-based higher education. However, MOOCs take this a step further, allowing free access to any interested party who signs in and partakes of the experience, yet it is not yet clear if these new versions of online learning carry all the requirements of a sound, measured learning experience with appropriate and necessary outcomes. MOOCs design should borrow from small-scale online design and delivery, rather than face-to-face models, but will also need to move beyond it.

## METHODOLOGY

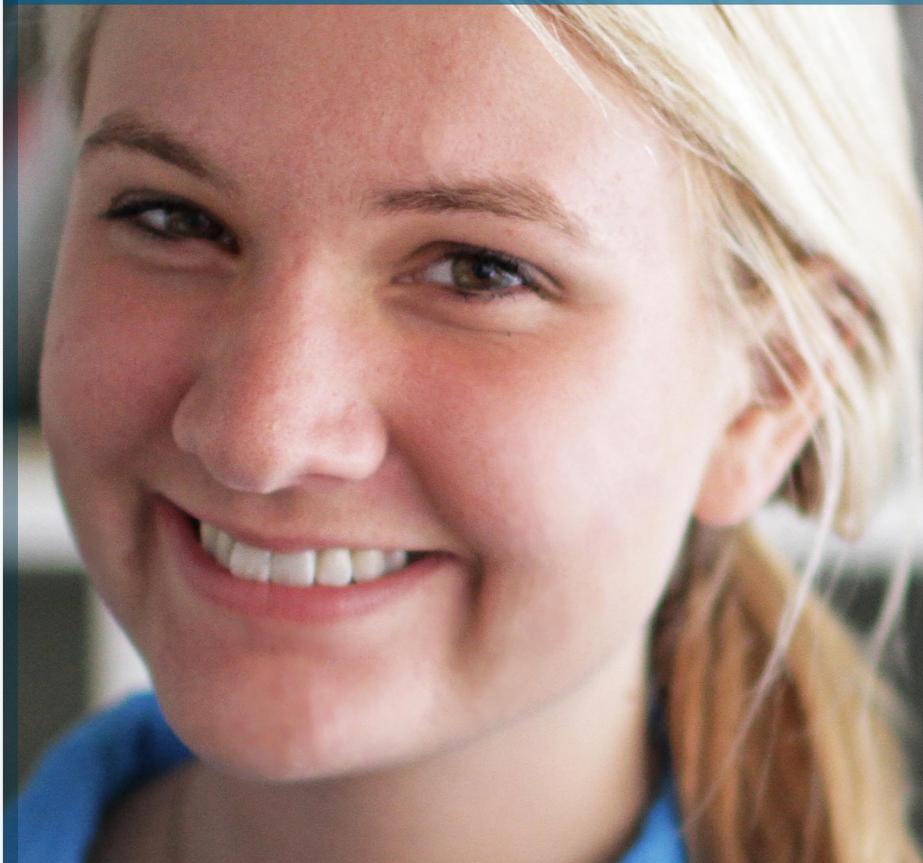
This research occurred in two phases. Using a process of analytic induction (Neuman, 2009), this exploratory research first employed content analysis of carefully selected published and open documents to identify:

1. characteristics of MOOCs recently designed and delivered, and
2. widely accepted online instructional design principles.

From this phase, a preliminary list of instructional design principles for MOOCs will be reviewed with expert online educators. Qualitative and quantitative data was collected. Survey responses to key questions are presented. In-depth interviews with 18 experienced online instructors yielded extensive textual data. Two coders reached an inter-rater reliability of 78%. The identified principles of MOOC instructional design are presented.

Beaudoin, M.F. (2003). Distance education leadership: An appraisal of research and practice. In M.G. Moore & W. G. Anderson (Eds.), Handbook of distance education (pp. 519-530). Mahwah, NJ: Lawrence Erlbaum Associates.  
Daniel, J., Kanwar, A., & Uvalić-Trumbić, S. (2009). Breaking higher education's iron triangle: Access, cost, and quality. Change: The Magazine of Higher Learning, 41(2), 30-35.  
Davidson, C. (2012, Dec. 10). Size isn't everything. Chronicle Of Higher Education . Retrieved from http://chronicle.com/article/Size-Isn't-Everything/136153/  
Keller, G. (2008). Higher education and the new society. Baltimore, Maryland: John Hopkins University Press.

**Q:** Which online instructional design and delivery principles are applicable to MOOCs, given increased class-size, unpredictable and wide ranging academic backgrounds, and varied purpose among learners? Which ID principles must be added in consideration of unique MOOC characteristics?

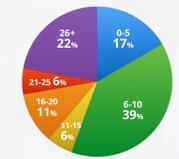


## SURVEY SAMPLE DESCRIPTION

### FACULTY POSITION



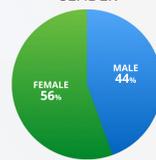
### YEARS OF EXPERIENCE



### DISCIPLINE



### GENDER



### REGION OF CANADA



### INSTITUTION



## INSTRUCTIONAL PURPOSE AND DESIGN PRINCIPLES

CODE	DEFINITION	FREQ.	EXAMPLES
<b>OPPORTUNITIES FOR CONTINUOUS LEARNING: The constant expansion of skills and skill-sets through learning and increasing knowledge.</b>			
Lifelong learning	Learning for a number of reasons: interest, community, profession, etc. throughout their lifetime.	15	... provide lifelong learning opportunities and continuing study opportunities and have those available to the community ... aspect of outreach and making research available ... but I think that MOOCs provide that great opportunity for people to learn about things they've always been curious about.
Information accessibility	Access to information no matter the time, place or space	11	large part of the population ... who otherwise do not have access to education ... access to it across time zones and across cities, so definitely that would make a lot of sense.
Experiential learning	Learning from experience / learner centred / hands-on activities	9	... engage in hands-on activities ... as tangible as possible ... much more effective than simply watching a video lecture or read this and take a little quiz.
Active learning	Responsibility in learning, personal independence in achieving ones learning goals	12	... active learning ... responsibility of the learner... self-directed learning, so if their learning is not active, or the learner is not responsible, who else would be.
Flexibility	Ability to learn no matter the time, place or space.	3	... available in one place and everyone can have access to it across time zones and across cities.
Engagement	Students make a psychological investment in learning.	2	When we have the opportunity to engage ourselves in activities that often brings home what it is we're talking about Opportunities for people who are different in some way or have a lack of background or have an advanced background needs to play out in our educational structure.

## SUITABLE FOR ONLINE DELIVERY: Subject area and content are suitable to be delivered in a MOOC.

Appropriate subject area	The subject area is appropriate to be delivered in an online format.	15	I would say that the arts, are very well suited for content in MOOCs ... courses would be certainly suitable like business courses, communication courses, English, and others, such as professional studies courses.
Content Specific	The subject content dictates which modality to use.	17	It depends on the content - content drives what would be the most useful modality I think the content and the nature of what is being learned should dictate the modality.

## CREATES A COMMUNITY OF LEARNERS: An opportunity where diverse learners can come together at a distance to learn with and from each other.

Knowledge community	A community of learners sharing knowledge	11	I think the idea of gathering a large number of people with a shared interest in learning or improving skills and understanding, it makes sense in a whole range of fields. It doesn't have to be just those subjects you see in university. ... knowledge development and knowledge transfer that is sort of community specific.
Collaborative learning	An opportunity where two or more people learn or attempt to learn something together	10	... to have that ability to operate collaboratively is very important and in an online environment it's one of the things that an online environment gives us. Collaborative learning can be very effective and if you're talking about a MOOC, you can have a really diverse group of people in a course.
Social interaction	The social aspect of learning, a learning community	8	People that are vitally important in supporting students through the adverse events and help them keep connected with the academic world. I think it's one of those intangible things that make somebody feel like they are part of something, and makes them feel like there is some sort of community that exists around this course. ... if you can increase the social interaction, then I think the outcomes would be better
Peer learning	Learners interacting, sharing and learning from their peers	10	Students should be discussing things with each other about the course primarily to make it relevant. ... the way in which people learn, they learn a lot more when they're learning from each other and helping each other and teaching each other.
Academic experts	Learning from experts in the subject field.	4	The instructor is a model and how they behave in an online environment and to the extent to which they behave in an online environment acts as a model to how students will behave. They have to be visible in a sense throughout the course.
Student perspectives	Students sharing their personal and unique perspectives on subject matters.	5	We enable more people to be able to say more things and I think that getting people out of that listening phase and into an engagement phase is really important. Individuality ... and self-expression is very important and I think a lot of people are searching for that kind of acceptance and so they want to express themselves as they are.
Student diversity	Recognition of student's educational, cultural and socio-economic differences and perspectives.	15	We tend to design University courses as if people are all the same and I think we lose people because of that, so I think recognition of diversity is important. They have to think about all different kinds of students who come from all around the world, different backgrounds, prior education socioeconomic status, and different occupations, and learning styles.

## MEDIA/TECHNOLOGY ENHANCES LEARNING: The use of various media and technologies appeals to various learning styles and student needs.

Learning style	The mode should reflect the learning style of students.	11	To accommodate the diverse learning community and its needs, everybody learns in different ways and everybody likes different things, so when we talk about universal design we should provide as many different prompts as we can because you don't know which one of those which will appeal to which student. Similar to in the classroom, I think that it is important that we appeal to different learning styles, so you can have a lecture, you can have videos, you could have slides, you could have graphs.
Text/PowerPoint	Text based delivery of content to students in MOOCs.	17	If you really want to know something, you have to dive into books or articles and things like that. So with text, I think it needs to be text and reading. It could be typed lecture notes that some people would like or could be readings that are from journals that are associated with the materials and speaker notes that go with them so that the student would get the interpretation from the teacher.
Audio	Audio based delivery of content to students in MOOCs.	12	It could be audio, of course that could just be the audio with of the visual. If you are studying things like music appreciation, you need to have sound. You need to have really good audio.
Graphics	Graphic based delivery of content to students in MOOCs.	6	For me in engineering, I use a lot of animations, a lot of graphics and that is in addition to a lot of narrative. ... the only way to teach effectively is to combine and use various forms, so I would say that you need to have multimedia, plus animation plus having some ways of simulation if possible, graphics, audio and visual.
Video	Video based delivery of content to students in MOOCs.	12	I love multimedia. I love high quality production videos. You could videotape lectures or podcasts on short topics and that could be one of the choices that students choose.

## ASSESSMENT: the process of documenting knowledge, skills, attitudes, and beliefs; the evaluation or estimation of the nature, quality, or ability of someone or something.

Evaluation	Determines competency, knowledge, completion / evaluation of competency / credentialing / formative / summative	32	You have to think very differently about what kinds of assessment you want for MOOCs versus an on campus accredited paid for course, because the interests of the student are different, the goals for the student are different. The type of assessment would vary and be different, not simply be a regular on campus assessment. ... would be really important to negotiate, especially between the learner and the facilitator, so the assessment then becomes more meaningful toward a particular objective for a course, but has continued meaning for the learner that engaged in that MOOC, and that is really the challenge of assessment.
Motivation (intrinsic/extrinsic)	The self-desire to seek out new things and new challenges and to gain knowledge / The performance of an activity in order to attain a desired outcome e.g. getting a credential	9	... it has to be subject material that is interesting on a cultural level. Otherwise, people will not engage. ... the topic has to be compelling to the general population, if it is an open MOOC
Subject mastery	Evidence that the learning objectives were met	11	I guess if you want to see that the students have picked up some skills after they've participated in a course, you'd want to be able to do that with a degree of certainty. And so now if you can be confident about the certification process then there definitely should be a relationship between the credit and assessment. ... if you're giving credit, that implies that a certain level of information has achieved some level of understanding.
Credential	Confirmation of qualification or competence, issued to an individual by a recognized post-secondary institution.	10	If a MOOC is used for a program that has specific credentials, or specific outcomes, that are given to us by an accreditation body, then the assessment needs to occur in a way that ensures that students have in fact met those objectives.