Business Models for Online Education and Open Educational Resources: Insights from a Delphi Study

Full Papers

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Abstract

This article determines the most important business models that try to achieve the goals of various online education stakeholders. We employed the Delphi method to consult leading experts in online education, asking them to identify existing business models; describe potentially feasible models that are not currently implemented; identify specific categories of stakeholders involved; and identify the various goals and priorities of these stakeholders. The experts, who included creators, distributors and facilitators of online education courses and materials, identified ten of the most important existing and potential business models for online education which they analyzed and commentated in detail.

Keywords

Business models, online education, open educational resources, Delphi method.

Introduction

Since the advent of the Internet, online education has played an increasingly important role in contemporary education (Caudill 2007). It is now often considered an essential approach to education as it breaks the traditional limitations of time and space in the delivery of education (Hyman 2012). A closely related phenomenon is open educational resources (OER), referring to educational materials available for liberal sharing and cumulative development (Stephen Downes 2007). Since educational materials are one of the most important aspects of educational quality, high-quality OER is particularly instrumental to raising the quality of education on a wide scale.

Also known as open courseware, OER aims to make educational materials available for liberal sharing and cumulative development. With new online education providers like Khan Academy and Coursera providing alternatives to traditional education, and with world-renowned universities like Harvard and MIT providing free online courses, OER and online education is rapidly changing the traditional way people learn. Most threatened by the new educational landscape are the less-renowned traditional institutions who often are scrambling to find ways to remain relevant by providing their own online offerings, and yet remain financially viable in the mass of reducing government funding for public education (Hyman 2012). Although some business models are arising for OER and online education, it is still uncertain which models are truly sustainable for different kinds of institutions. To meet this need, this article describes a Delphi study that determines the existing business models for online education and OER.

The development of online education in the past two decades has increasingly delivered on the promise of a bright educational landscape where the restrictions of time and space are broken such that high-quality educational resources can be available to anyone with Internet access, often at no charge (de Langen 2013). Online education enhances the educational experience in numerous ways: among others, it provides students with a broad variety of educational materials; it connects students to be able to learn from their peers; it lets them choose their own pace of learning; and it can provide instant feedback for assessments (Agarwal 2013).

Often building on the platform of online education, OER enables people to freely share, use and redistribute educational materials. It permits educational resources to be legally "adapted or localized to the needs of specific situation" (Hilton III et al. 2010, p. 8). For developing countries, to some extent OER can relieve the challenge of authoring educational materials, which is one of the most costly and time-consuming aspects of online education (Kanwar et al. 2010). Furthermore, because of its legal openness, OER can benefit global knowledge exchange and increase society's shared commonwealth of knowledge.

Online education and OER, while important, are infeasible without sustainable business models. As "models", sustainable business models can be duplicated to enable generalization and large-scale promotion of online education and OER (Caudill 2007). In addition, potential outstanding business models appeal to investors, which can help build a more active market and incentivize constant innovation. In fact, our study revealed that many existing online education ventures fully or partially rely on donations or short-term funds, which are to some degree vulnerable and not necessarily sustainable for the long term.

The need of sustainable models is highlighted by some notable examples of failed online education ventures (Shumski 2013). Tutorspree tried to connect students with tutors for a fee, but proved unsustainable when the connected tutors and students continued their relationships offline once connected without paying anything further to Tutorspree. Kno built hardware and then software for interactive e-textbooks, but failed mainly due to competition from the nascent iPad as a more general tablet platform. Some platforms were designed for supporting teachers rather than students directly. Knack for Teachers was an online gradebook for teachers that never proved sufficiently popular. Collabo, an online collaboration platform for teachers, failed mainly due to mismanagement. These failed ventures demonstrate that viable business models are not necessarily widely known; hence, our proposed article treats an important and needed topic.

To discover the business models, we consulted experts in online education and OER using the Delphi survey method, a rigorous methodology with mixed qualitative and quantitative elements for research questions whose answers are not easily scientifically discernible, but are rather best answered by expert opinion. We adopt a business model framework that emphasizes the role of the key stakeholders (content creators, learners and education providers) and their respective goals (Okoli 2015). Specifically, we asked experts: to identify existing business models; describe potentially feasible models that are not currently implemented; identify specific categories of stakeholders involved; and identify the various goals and priorities of these stakeholders. We surveyed experts drawn from the ranks of teachers, students, educational administrators, online education providers, government education officials, and other relevant experts.

This article is structured as follows. Following this introduction, we briefly review the literature related to business models for online education and OER. Next, we describe the Delphi study we carried out to identify business models and we present a profile of the participating experts. Next is the major contribution of the study: a presentation of the top ten business models identified by the experts. We end the article with general discussion on the models and the implications of the study.

Literature Review

Although several studies have analyzed online education and OER, only a few have attempted to systematically examine various business models. Two that did specifically studied OER business models, perhaps since it is more challenging to understand how to sustain an effort based on giving away materials at no charge.

Downes (2007) identified four general categories of models that involve significantly different aspects of the provision: funding models (how financial resources are obtained), technical models (the technologies used to create and deliver the OER), content models (how the content itself is created and kept up to date, especially concerning quality standards), and staffing models (how the human resources are provided and managed). Whereas his early perspectives are insightful and valuable, a lot has changed in the online education landscape since 2007; some models that initially looked promising have not proved fruitful, and new models have since emerged, featuring major enterprises such as Khan Academy and Coursera. An updated examination should reveal what has worked and what has not.

De Langen (2013) adopted an approach similar to ours in identifying the various stakeholders involved (whom he identified as governments, users, organizations and individuals) to consider business models for OER. With this perspective, he identified four general business models: freemium, efficiency, subsidizing

and platforming. In addition, he proposed a new "community-based" model. However, in the search for structure, De Langen's generic models fall short of recognizing the rich diversity of models within his major categories. A finer-tuned approach is needed than simply recognizing four or five typical categories.

In order to identify the broad array of real business models in today's landscape, we conducted a Delphi study to learn from qualified experts in online education and OER, guided by a rigorous scholarly framework. The rest of this article describes the Delphi study and its results.

Research methodology

To discover the business models, we chose to apply the Delphi method, a qualitative research methodology for soliciting group decisions from panels of experts by providing a multi-round anonymous communication environment for their evaluation and discussion. Basically, we followed the rigorous guideline described by Okoli and Pawlowski (2004), with adaptions for our specific situation and research questions. We followed a similar methodology as was used for a similar Delphi study on business models for online education and open educational resources (Okoli and Nguyen 2015).

Delphi Study of Online Education Experts

There are two main stages of our Delphi study: selecting and inviting the most qualified experts in online education and OER; and organizing three rounds of anonymous discussion on the questions. We asked experts to: list existing business models of online education and OER other than those initially presented by the research team, and to propose new potential business models; evaluate and rank the significance of each of the models suggested and identify the relevant stakeholders for each respective model; and map the top business models selected by experts with the appropriate stakeholders, goals and priorities for each model. Throughout the process, we encouraged the experts to offer comments during each round, and we provided these anonymous comments to other experts in each subsequent round.

Step 1: Prepare Knowledge Resource Nomination Worksheet (KRNW)	✓ Identify relevant disciplines or skills: content creators, students, distributors/providers and other stakeholders ✓ Identify relevant organizations: OER repositories, MOOCs, NGOs, K-12 schools, colleges and universities that use and produce OER, universities that offer open courseware, galleries/museums/archives/libraries that use and produce OER, governmental ministries of educations ✓ Identify relevant academic and practitioner literature, as well as relevant websites
Step 2: Populate KRNW with names	✓ Collect names of experts in corresponding disciplines or skills ✓ Collect names of experts in corresponding organizations ✓ Collect names of experts from academic and practitioner literature
Step 3: Rank experts	✓ Organize detailed sub-list of each discipline ✓ Identify and classify experts and match them with relevant category ✓ Rank experts in each list based on qualifications and expertise
Step 4: Invite experts	✓ We invited a total of 81 experts from all four skill categories ✓ We asked experts to nominate other experts at the same time we invited them ✓ A total of 21 experts agreed to participate

Table 1. Phase 1: Selecting experts for the study

We describe the actual steps we took in Table 1 and Table 2. There are a few notable points concerning our methodology. First, whereas Okoli and Pawlowski recommend a distinct step for requesting selected experts to nominate other qualified experts, we rather made the nomination requests immediately at the same time that we initially invited experts. Fortunately, we did obtain additional qualified participants this

way. Second, according to the guideline, experts should normally be grouped into panels of 10-18 experts each, based on similar disciplines or skills, to make it easier to reach consensus. However, with a total of 21 total positive responses to our invitation (only 19 eventually participated), we decided to employ only one panel that included all experts in order to have one satisfactorily-sized panel. Third, because we had only one heterogeneous panel, we unfortunately lost the ability of a Delphi study to reach consensus after successive repeated rounds. Because of this, in addition to resource limitations, we conducted only three rounds for this Delphi study, each of which featured a different major task (Table 2). We did not have any intermediary consensus rounds. Fourth, in Round 1 of the study (Table 2), we initially suggested a number of business models identified from the literature (Stephen Downes 2007; de Langen 2013; Ren 2014) and from our own experience; experts added to this initial list for subsequent rounds.

Round 1: Brainstorming of business models, stakeholders and goals	✓ Provide the experts with an initial list of existing business models for online education and OER identified by the research team, along with the relevant goals and stakeholders for each business model ✓ Request additional existing business models from the experts other than those initially listed by the research team ✓ Request new potential business models from the experts that do not currently exist, but that might potentially be feasible and sustainable ✓ Request other important stakeholders and goals and priorities from the experts which might not necessarily correspond to any of the listed or proposed business models ✓ Consolidate the results from the experts and merge it with initial lists presented by the research team, and reconcile duplicates and conflicting or similar terminology.
Round 2: Narrowing down to top ten business models	✓ Present the consolidated list of business models at the beginning of the second round for experts to validate ✓ Ask the experts to rank the business models according to the level of their significance ✓ Ask the experts to match various stakeholders and their goals and priorities with relevant business models ✓ Ask the experts to evaluate if it is feasible to use OER with each business model ✓ Retain top 10 business models with the highest ratings of the experts
Round 3: Matching stakeholders to goals and priorities	✓ Refine top 10 selected business models with detailed association of various stakeholders with their goals and priorities ✓ Ask the experts to validate the association of various stakeholders with their goals and priorities in the top 10 models

Table 2. Phase 2: Three Delphi rounds of the study

Profile of Expert Participants

19 different experts in online education participated in the study. Around half had administrative experience in teaching institutions or non-governmental organizations that employed or advocated online education. Some were content creators of online education materials and OER, some were teachers of online education, and some had taken online courses themselves in the student role. Although the main qualification for our selecting them was online education rather than OER per se, almost all the experts were very familiar with OER. The experts had an average of 12.7 years of active experience with online education. 9 of 14 respondents had gained their online education experience in the United States; others had gained it in Africa or other countries. 10 of 15 respondents were male. 10 of 15 respondents were aged from 35 to 54. Full demographical details are available in the full report (Okoli and Wang 2015).

In Table 3, we list 11 participants who kindly agreed to permit us to publish their names. As can be readily seen, these are world-class experts in various aspects of online education and OER. Those who chose to keep their identity confidential are equally diverse and equally distinguished. That said, their participation

cannot be taken as an endorsement of the results, in whole or in part, since the Delphi process gave rise to many opposing viewpoints.

Expert	Affiliation *(Note: Experts speak only for themselves; their participation or responses do not necessarily reflect the opinions of any of their affiliated organizations)*
Dr. Jessica N. Aguti	Education Specialist of Teacher Education at Commonwealth of Learning
Dr. Mark Bullen	Adjunct Professor, Master of Educational Technology, University of British Columbia
Scott Deeann Chen	PhD candidate who participated in 29 MOOC courses in 2013
Stephen Downes	Creator of the first MOOC course, Learning and Performance Support Systems Lead at the National Research Council of Canada
David Harris	Editor in Chief of OpenStax College/Connexions, producer of high-quality OER textbooks
Vis Naidoo	Vice President of Commonwealth of Learning
Peter Pinch	Production Manager of MIT OpenCourseWare
Dr. Norma I. Scagnoli	Editor of the featured WikiBook *Blended Learning in K-12*
Dr. Patrick O' Shea	Co-author of the featured WikiBook *Social and Cultural Foundations of American Education/Development Process*
Willem Van Valkenburg	Production and Delivery Manager of open and online education at Delft University of Technology Extension School
Lindsey Weeramuni	Manager of Intellectual Property at MIT OpenCourseWare

Table 3. Participants in the Delphi Study Who Agreed to Publish their Names

Top Ten Online Education Business Models

The Delphi study consisted of three rounds, during each of which experts examined and commented on each business model. Based on their comments, we made extensive revisions to each model, including merging some similar models. The result was 18 business models (15 existing and 3 potential) with a particular focus on the stakeholders and goals of each model.

To make the analytical task more manageable for the experts, in Round 2 they prioritized which models they would prefer to analyze in detail in Round 3. Based on their ratings, we selected ten models. Note that in this study "top ten" does not necessarily mean the most recommended or favourable business models; it means the most important or significant. Specifically, in Round 2 we asked the experts:

> *In order to reduce the number of models for detailed evaluation, please specify for each of the models here whether or not the model is sufficiently important, significant, feasible or noteworthy for experts to take the time to evaluate in detail. Only the significant business models chosen by most of the experts will be evaluated in the next round of this study.*

We chose the number ten since we felt that this was a manageable number for the experts to focus on with their limited time (rather than all 18), and ten is a nice round number. We specifically reserved at least two slots in the top ten for potential models that do not currently exist, so as to ensure that at least some potential models would be examined in more detail. Thus, out of the ten, eight are existing models and two are potential. The full report (Okoli and Wang 2015) displays the experts' rankings and explains the selection criteria in detail.

In the following subsections, we present the top ten business models, with the eight existing models listed first in order of the experts' level of interest, and then the two potential models listed next, also in order of the experts' level of interest. The full details about all the models in this article can be found in the full study report (Okoli and Wang 2015).

Top Eight Existing Online Education Business Models

We list here the top eight existing models in the order of the experts' rating of their importance. For each model, we present a brief description and examples, as well as a summary of the experts' comments regarding the overall model's sustainability and the feasibility of OER as an aspect of each respective model.

Donations and grants

A non-profit organization manages the online education offering and receives donations and grants for continuous funding. If sufficient funds are obtained, an endowment might be created. Funds are used to provide revenue to content creators and the content and course administration (if included) is provided at no charge to students. In some cases, content creators volunteer their contributions for no compensation. These donations might be more in the form of corporate or foundation sponsorship, where the sponsor might be acknowledged in course materials or receive other benefits. Unlike the "Governmental or foundation sponsorship" model, here the education provider retains control of the endeavour; however, significant donors might exert influence on the future direction of the offering. **Examples:** Khan Academy; Wikibooks; OpenStax; WGBH sponsorship by Biogen Foundation; MIT OpenCourseWare.

This is a very popular model, but the experts agreed that it is not very sustainable because it isn't regular or dependable. Nonetheless, they indicated that major grants or even endowments could be extremely helpful, especially if OER is to be supported. 8 experts agreed that OER is feasible; 0 experts disagreed. They generally felt that donations can fund OER. However, there was concern about how OER might continue to be funded if donor support should dry up.

Online program of traditional institution

This model is the online courses division of a traditional university, where a traditional face-to-face educational institution establishes and administers an online education program that provides an online outlet for its educational materials and programs. Funding is obtained through various means including general institutional resources (free to students), student tuition, or dedicated donations. **Examples:** MIT OpenCourseWare; university online offerings; libraries.

On one hand, the high tuition is a barrier to students in this model; on the other hand, institutions are being forced to add this model to their current offerings whether they like it or not, if they want to stay relevant in today's educational landscape. 8 experts agreed that OER is feasible; 0 experts disagreed. That said, the experts felt that OER was rarely produced by traditional institutions.

Community-based production

Members of a community of practice or interest group create materials for each other's use. This can also be called a "prosumer" model. **Examples:** Wikipedia; WikiEducator; Phil Preprints

Experts expressed two different views on the sustainability of this model. One perspective was quite optimistic in the value of a community collectively owning and maintaining educational resources. The other perspective was that to be successful, the model must depend on a few core people; unfortunately, once those people left, the community would fizzle out. 3 experts agreed that OER is feasible; 0 experts disagreed. One expert said, "This is the primary business model for OER today".

Advertising

Paid advertising is placed on OER content. The students do not have to pay. The model can include anything from extended training for purchasers of a complicated product to the provision of learning materials to stimulate interest in a hobby, vocation or product line. Advertisements will be included throughout the education program and fund the whole program. **Examples:** Academic Earth; OpenStudy; Cooking shows; photography lessons (eg. Nikon's series on becoming a better photographer); how-to construction guides (eg. http://www.askthebuilder.com).

The experts felt that because of advertising's success in other industries, it is at least worth exploring as a possible source of sustainable funding for online education. However, there were a number of concerns

expressed with the ethical issues of exposing students to advertising. 4 experts agreed that OER is feasible; 0 experts disagreed.

Cooperative production consortium

Free and open peer-reviewed collection of online teaching and learning materials and faculty-developed services contributed and used by an international education community. The collaboration is a partnership among different institutions and organizations for the creation and distribution of educational materials. People may purchase memberships, or member institutions may pledge to commit a certain amount of capacity (there are different sub-models here), but essentially each contributes a little, and everybody uses the totality of the results. **Examples:** Merlot.org (http://merlot.org); Western Canadian provinces contribute to and share a common curriculum.

An expert observed that this model doesn't work well with educational resources because the needs of each user are quite particular, and so the one-size-fits-all offering doesn't meet the need. 6 experts agreed that OER is feasible; 0 experts disagreed.

Governmental or foundation sponsorship

A government, non-governmental organization, or non-profit foundation establishes and administers an online education program or resource centre with educational materials and programs. This is different from the Donations and grants model in that the program is directly administered and primarily funded by a governmental agency or a similar entity that has a much larger scope of concern (and resource allocation) than just the specific online education program. **Examples:** Commonwealth of Learning; Saylor.org; Wikiwijs.

On one hand, government funding was seen to be a relatively long-term source of funding. On the other hand, experts felt that such funding could not continue perpetually because of fluctuating government revenues and even political priorities. The disadvantage of the model is that once the government funding stops, the entire project often terminates completely. 9 experts agreed that OER is feasible; 0 experts disagreed. One expert observed that "government funding seems likely to require the outcomes to be open", which would suggest that, unlike traditional institutions or for-profit educational institutions, government funding is a promising (though unstable) source for OER, since the interests are aligned.

Institutional subscriptions

A provider gives educational materials away for free to individuals, but charges subscription fees to institutions to use them across larger populations. **Examples:** Monterrey Institute's HippoCampus (http://www.hippocampus.org).

4 experts agreed that OER is feasible; 1 expert disagreed. Because of the restrictions placed on distribution by large institutions, one expert questioned if this model was even compatible with OER.

Selling course experience only

The online materials are free, but students pay for the online education experience, including having a teacher guide them and respond to questions throughout the course. The "experience" might include a schedule, corrected assessments, proctored exams, a completion certificate, or other value-added educational experiences. They normally pay for each course they enroll in. Course creators and teachers are paid for providing the courses. **Examples:** Udacity.

This is a common path to revenue for online course providers who offer free materials. However, the margins are low, and the learners have to clearly perceive a high quality educational service. 5 experts agreed that OER is feasible; 0 experts disagreed. The experts were divided as to how conducive this model was to OER. Around half felt that OER is indeed feasible, and even provided examples such as the Johns Hopkins Bloomberg School of Public Health and connectivist MOOCs. Others, though, emphasized that this model does not necessarily lead to the creation of OER.

Top Two Potential business models

We list here the top two potential models proposed by the experts, again in the order of the experts' ratings. Since they are potential models, any examples listed by analogy are not actual instances of the models.

Content creation by classroom students

Each term or year of a class or course creates learning materials for the next term or year. The purpose is to stimulate learning by teaching. It's a bit like Digital Storytelling at the University of Mary Washington (ds106, http://ds106.us), except the resources are explicitly teaching resources.

The experts felt that while this was a promising model, it would only work within narrow settings like in individual classrooms or schools; it probably cannot produce materials general enough for widespread use. 3 experts agreed that OER is feasible; 0 experts disagreed.

Content creation by MOOC students

Participants of MOOCs from diverse backgrounds, countries and academic preparation can develop resources for each other. MOOCs become venues to create communities of learning and communities of practice. Those networks connect and share information and resources. They can share information and multiple sources to enhance their knowledge and this becomes OER.

The experts were rather skeptical about the sustainability of such a model. One compared it to Wikipedia, which the expert perceived as a rather homogenous and centralized community. 3 experts agreed that OER is feasible; 0 experts disagreed.

Implications of this study

We believe that the article will be interesting and valuable to a wide variety of people involved in various ways with online education, including online educators, investors, donors and educational researchers. The analysis of the business models will give these interested readers the knowledge to confidently launch or support sustainable business models for online education and OER.

Online education operators and entrepreneurs are perhaps the most direct beneficiaries from the results of this study, as they actively try to develop and maintain healthy business models. With a viable business model that can maintain high quality materials and sufficient and constant students, an online education operator will have a greater chance to attract investors' attention.

Online education content producers need to be sufficiently motivated and attain their goals in order to continue contributing high-quality content. If content creators can get reasonable and regular reward for contributing valuable educational materials, they will possibly vote themselves more into the content sharing and producing.

Teachers and educators complement their teaching with online education resources, including with high-quality OER. The problem of insufficient high-quality materials in developing countries' might be partly solved, giving students there more choices and chances of education.

Donors, foundations and non-governmental organizations that support education can be better guided in their expenditures and project allocations. The more the learners, creators and distributors benefit from a certain business model, the better reputation the donors and NGOs get.

Commercial Investors in online education would like to assure that their investments obtain maximal returns. A healthy business model can be the core part of sustainable revenue-making by reducing cost and optimizing resource allocation.

Government educational officers and public school administrators will be better guided in setting appropriate education policy and in responsibly using citizens' funds for the most effective educational outcomes. If an online education and OER model proved effective and inspiring during small-scale experiment, it may become a promising solution of existing educational problems like teacher shortage and learning customization.

Education researchers can be informed of sustainable business models with the confidence of a scholarly rigorous study.

We note that although it is unlikely that students of online education would read an article such as this, they are hopefully the ultimate beneficiaries of the sustainable business models that this article highlights. Even if perhaps indirectly, they are the ones for whom business models for online education and OER is most important.

Conclusion

Online education and OER have matured beyond the initial stages where they were mainly considered public welfare initiatives. However, the challenge is now increasingly evident to implement sustainable business models that will permit these initiatives to exist as going concerns (Kanwar et al. 2010). There have been prior attempts to compile business models for online education and OER (Stephen Downes 2007; Kanwar et al. 2010; de Langen 2013). However, the most thorough ones were conducted long before the present landscape took shape (S. Downes 2007), before today's leading online education providers such as Khan Academy and Coursera even existed. With the hindsight of numerous failed attempts (we described a few in the introduction) and of many successes, we are in better position today to identify concrete aspects of what makes for long-term sustainability in this domain.

We presented the most important existing and potential business models for online education and OER, based on a Delphi study of leading experts in online education. After three rounds, 18 business models were identified, of which ten were highlighted as particularly important (of which eight are existing models and two are potential).

The primary contribution of our study is this carefully evaluated list of the most significant business models for online education and OER. Furthermore, the experts took a forward-looking approach to suggest and evaluate some new potential business models for online education and OER.

Acknowledgements

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