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Research notes

Online MBA programs and the threat of disruptive innovation

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ABSTRACT

Online MBA programs are examined through the lens of disruptive innovation theory. Disruptive innovations appear at first to be inferior to the level acceptable to the consumers of the products offered by incumbents, targeting an audience ignored by the latter; as they improve, challengers can challenge market share. Using data from the 2011–2012 US News and World Report survey of online MBA programs, this paper evaluates the extent to which this model applies to online MBA programs offered by institutions accredited by the Association to Advance Collegiate Schools of Business (AACSB) (incumbents), and those offered by MBA programmes with other accreditation (challengers). Many significant differences are found, in areas such as acceptance rates, target audiences of potential students, pricing, faculty, class sizes, and support services. These differences indeed cast the incumbents and challengers in the roles outlined by the disruptive innovations theory, indicating that incumbents may be at risk of disruption.

1. Introduction

As more and more industries face disruption from the relentless spread of digitization, an emerging threat to MBA programmes may be the move to online learning. Michael Bassis, a prominent leader in this movement, noted in 2009, "few colleges and universities will have the luxury of using a slow, evolutionary strategy that entails [putting] their courses [online] one by one" (para. 19). He continued: "There are enough for-profit and not-for profit institutions that are quickly putting the pieces together to be in a position to mass-market multiple, high-quality, low-cost degree programs that students of all types will find enormously attractive" (Bassis, 2009; para. 19). The ubiquitous nature of the Internet means that competition is not constrained by national boundaries.

Should leading business schools be worried? As early as 2011, "over six million students [in higher education were] enrolled in [exclusively] online higher education classes" (Stage, 2011). Market share as a percentage of number of graduate-level business students at for-profit institutions alone increased from 7.8% in 2000–2001 (enrollment: 254,687) to 20.6% in 2008–2009 (enrollment: 440,482) (Nelson, 2011). As recently as 2014, "[f]or profits [made] up the fastest growing segment of higher education … " (Porter, 2014).

Many leading business schools have used top-level accreditation to shield themselves from institutions with poorer reputations for effectiveness. The Association to Advance Collegiate Schools of Business (AACSB) was originally oriented towards PhD-granting, research-heavy institutions, but as Bieker (2014) explains, AACSB accreditation has become broader to focus on how well business schools are achieving their self-formulated missions. Nelson (2011) describes how AACSB-accredited institutions may view other institutions without this credential: "Many for-profit institutions are seen, rightly

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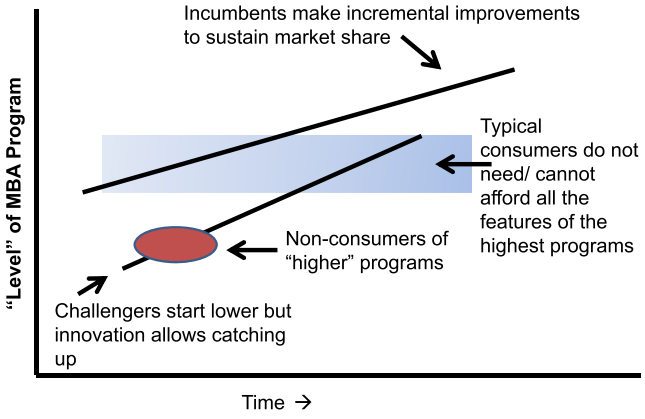

Fig. 1. Disruptive technology model.

or not, as having less stringent requirements with regard to admissions, faculty qualifications, curricula, etc., than other (particularly AACSB-accredited) schools". This negative outlook seemed particularly justified when online courses were "simply computer-based versions of traditional lectures and exams, [and] the quality of online learning fell far below that of face-to-face instruction" (Christensen & Eyring, 2011, p. xxiv). Furthermore, faculty who had not yet taught online courses were more skeptical about whether online courses could deliver better results (Meyer, 2010; Starr-Glass, 2011).

As of this writing, AACSB has accredited 761 institutions globally, with 540 in Northern America (71%); 110 in Asia and Oceania (14.4%); and 91 in Europe (12%), including 27 in the UK (3.6%) (AACSB, 2016). Bieker (2014) notes, "Accreditation by AACSB International (AACSB) is regarded as the gold standard of achievement in business education around the world" (p. 284). Two European based accreditation bodies—The Association of MBAs (AMBA, based in London), and the European Quality Improvement System (The EFMD Global Network's EQUIS, based in Brussels)—may serve a similar purpose.[1]

This study examines whether there is a gap between the AACSB-accredited, "incumbent" fully online MBA programs (AAI), and fully online MBA programs offered by non-AACSB-accredited institutions (NAAI), be they public, private, or for-profit ("challengers"). It does so through the lens of Christensen's model of disruptive innovations (1997). The essence of the model is that incumbents ignore "non-consumers" of their product who become early adopters of innovations from challengers. As the challengers' products improve, more and more consumers shift, ultimately leaving the incumbents with too small a market share to be viable. Christensen's model (Section 2) presents the criteria by which to judge whether or not the AAI and NAAI fully online MBA programs look alike (the null hypothesis). If the null hypothesis cannot be rejected, then is cannot be said that some of these programs constitute a disruptive innovation. If enough differences are found as the model predicts, then incumbents have good reason to be concerned.

Section 3 explains data used in this study, and Section 4 systematically investigates differences between programs offered by the two types of institutions. Section 5 discusses these results, and Section 6 considers what might constitute the most disruptive aspects of these innovations in the future. This paper also contributes to the understanding of the theory of disruptive innovations, following the suggestion of Christensen (2006) to investigate the theory empirically with examples from industries that range far afield from its original formulation in manufacturing.[2]

2. Signposts of disruptive and sustaining innovations

As Christensen and his colleagues have documented, it is all too easy for incumbents to be initially complacent about new technologies. In the beginning of online education, for example, "[o]nly consumers who couldn't attend a class offered at just one place and time, such as working adults, found this new form of education attractive or at least tolerable" (Christensen & Eyring, 2011, p. xxiv). Disruptive innovations such as "fully online" are often worse (at first) than the incumbent technology they are ostensibly competing against; target low-end "non-consumption" consumers who have never been targeted by the incumbent; and exist in a business model/ecosystem that is outside of, or radically different from, the business model/ecosystem of the incumbents. Non-consumption segments may include those who work full time with families, those with

[1] Wikipedia (2016) provides a valuable comparison of these three types of accreditation. EQUIS has been used to accredit 161 business schools worldwide, including 16% in the UK, an additional 37% in Europe, and just 8% in the US (EFMD Global Network, 2016b).

[2] Danneels (2004) offers a critique of major portions of the theory, and debate about it has been vigorous. Many criticisms are answered by Christensen (2006). It is beyond the scope of this paper to consider all the research on this model. Tucker and Miron (2012) conclude that online innovations in higher education so far are just incremental and sustaining, but consider fewer aspects of the model and use less comprehensive data than are considered here.

limited mobility, those in foreign countries and non-native speakers; or those who cannot be admitted to or afford programs with leading accreditation (i.e. AACSB, EQUIS, AMBA).

Eventually, the disruptive innovation is improved to the point where the incumbents start losing market share (Christensen, 1997, 2006; Christensen & Eyring, 2011; Christensen & Raynor, 2003; Christensen, Horn, & Johnson, 2008; Schmidt & Druehl, 2008) As Fig. 1 illustrates, the disruptive technology may or may not overtake the older technology, but if it causes enough consumers to jump to the challenger, it can leave only the most elite and expensive institutions as viable.

In industry after industry incumbents have then been displaced unless they have been able to buy the competitor or set up autonomous units to develop and market the new innovations themselves (Christensen, 1997; Christensen & Eyring, 2011; Christensen & Raynor, 2003). Setting up autonomous units or special "heavyweight" cross-functional teams are difficult solutions to apply in business schools that are mired in the bureaucracies of their universities, sometimes constrained by unions, and if state-sponsored, subject to state regulation (Christensen & Eyring, 2011). Julian and Ofori-Dankwa (2006) argue that AACSB accreditation may inhibit the kind of innovation needed in the face of disruptive changes. Romero (2008) provides support for the idea that business schools are part of larger university bureaucracies that slow down innovation, although specific goal-setting promoted by AACSB may help to ameliorate this.

Furthermore, when incumbents adopt the innovation, they tend to coopt it. "Even when a truly new way of doing things occurs to someone in a successful organization, *the established systems and standards* take over. A new idea that isn't dismissed entirely is almost inevitably modified to fit the ways things are traditionally done, losing its innovation impact in the process" (Christensen & Eyring, 2011, p. 239, emp. added). Use of the innovation has to sustain the organization's ability to meet the needs of their most demanding customers and/or sustain the types of margins they are used to getting (hence it becomes what Christensen et al. call a "sustaining" technology or innovation). By effectively listening to their leading (and most profitable) customers, incumbents keep adding features and capabilities that these customers want/need, eventually driving their products/services past the wants/needs of many other consumers. "… [M]any institutions are … ripe for disruption by lower-cost providers of higher education. Following a common pattern, traditional universities have let their focus on the most elite students take them beyond the needs and preferences of ordinary ones" (Christensen & Eyring, 2011, p. 205, p. 205).

In this study, it is hypothesized that the AAI offering fully online MBAs are doing so in a manner that most resembles a sustaining innovation. AACSB accreditation is a powerful force itself pushing in this direction. It is built to recognize and ensure the continuation of many aspects of the way that incumbents do business (Christensen & Eyring, 2011). It is a time-consuming, "heavy" process that is directed to all of the programs offered by a business college (undergraduate, graduate, and with a separate accreditation for accounting programs that meet specific additional standards, and online).[3]

In order to be accredited, a large percentage of the faculty must be "academically" or "professionally" qualified; in the case of the former, this means that faculty must be actively engaged in research work and publishing regularly (Trifts, 2012). Specialization and departmentalization around research expertise follows, driving choices about offerings of degrees and concentrations (Christensen & Eyring, 2011). Emphasis on research can drive costs up dramatically as institutions may need to hire more research faculty to meet the standards and then pay them more to stay (Trifts, 2012). For example, in 2010 Southern New Hampshire University decided not to pursue AACSB accreditation, concluding that "[w]hile that specialized accreditation is becoming more common and brings additional prestige, our analysis revealed that it would redirect more than $2m per year to activities and priorities that showed no demonstrable improvement in the experience of students" ("Southern New Hampshire …", 2010). Some institutions also find achieving EQUIS and/or AMBA accreditation too expensive (Wikipedia, 2016).

How can it be judged whether AAI are offering fully online programs as a sustaining technology? It would be expected that if the online products they are offering are "gold-plated" enough, like their usual offerings, they can then attract "higher quality students," eschew the lower-end market, and charge premium prices. The University of Southern California (USC), for example, launched an online MBA in 2015 at a cost of $93,502 (Byrne, 2015). If AAI's are seen as engaging in purely cost-cutting measures, this may drag down their reputation, so "online" cannot be equated with "cheap" (Meyer, 2010). It may be expected that online students have access to all the kinds of additional support, such as dedicated career services, that these top programs provide. Being "gold-plated" may include using their regular faculty in the online program. With little ability to readjust the cost structure of their faculty (and faculty salaries inexorably rising), they may see increasing student-faculty ratios as the sole means of creating viable online programs. These institutions would have strong reasons to want to avoid cannibalizing their on-campus programs by allowing students there to take the online courses.

For schools like Harvard that base much of their curriculum on in-class case discussions, the online program would have to be highly synchronous and interactive (Daniels, Okon, & Watson, 2015). Since research is beginning to show that "blended" versions where students take part of the coursework while physically present on campus are preferred by students and may perform more effectively than either online or on-campus versions (Bentley, Selassie, & Parkin, 2012; Ladyshewsky & Taplin, 2012; Meyer, 2010), it may be expected that incumbents will be loath to give up all face-to-face contacts and may be more likely to require presence on campus for certain activities. One-third of the time in the USC programme, for example, is spent in online live interactive "face to face" sessions with professors (Byrne, 2015).

In this paper, it is hypothesized that the NAAI that are offering fully online MBAs are doing so in a manner that most resembles a disruptive technology. If correct, it would be expected to find that lower-end, non-AACSB-accredited programs

[3] See Bieker (2014) for a more extensive discussion of all aspects of AACSB accreditation.

may be focusing on "non-consumer" markets ignored by the incumbents. They should be lower cost—which may include making greater use of non-tenure-track or part-time faculty. They should have easier admissions standards in order to serve the "non-consumer" market and to broaden the customer base. They may require only lower level technology, be less interactive, and provide less secondary support.

This picture is more complicated, of course, because the institutions initially serving the lower end may also have started to make improvements that move them up the bottom line shown in Fig. 1. Two relevant areas are: programs and schedules, and the ecosystem/business model adopted (Christensen & Eyring, 2011; Christensen et al., 2008).

With fewer constraints about hiring qualified instructors from anywhere and matching them with students from anywhere, the challengers could have the ability to offer specialized programs that the incumbents cannot. Alternatively, the challengers would not feel compelled to field programs in all areas, but could concentrate on a smaller number that they do well. Without institutional barriers arising from departments, there would be more opportunities for integrative learning experiences, especially for introductory courses. Course schedules could be flexible and year-round. Thus one would expect to see more specialized programs, fewer instances of offering concentrations or programs from all the major areas, integration, and flexible schedules.

Finally, the challengers can make use of the emerging open source ecosystem of inexpensive tools. Shaik (2006a, 2006b) catalogs a number of the open-source tools now emerging for distance education, asserting that they cover all of the necessary elements in the "stack" that is needed to put together low cost systems. Online courseware is being developed and posted for free use (Bassis, 2009). Tucker and Miron provide a recent example of creating an online course with open source tools in two days (2012). If the challengers have innovated this way, it may be expected to see more use of open source software.

3. Data and methodology

This study uses comprehensive data about online MBA programs available to prospective students, from the 2011–2012 US News and World Report survey (USNWRS) (http://www.usnews.com/education/online-education/mba). Overall, USNWRS was sent to over 400 graduate business programs for all of its rankings ("Why an Online …", 2012). The respondents included in the data relative to online programs came from institutions that had all or at least 80% of their program online. They also had to have some form of accreditation in general. They encompassed 82 non-AACSB-accredited (NAAI) US institutions (50.9%) and 79 AACSB-accredited (AAI) US institutions (49.1%).[4]

Using the AACSB website list of online MBA programs and a list on the website MBA-Options (http://www.mba-options.com/), 41 more institutions were discovered that had not responded to the USNWRS, for an inferred response rate of 64.2% for AAI. Again pooling the additional 175 institutions with online MBA programs that either had regional or national accreditation of some sort (but not from AACSB) listed on the MBA-Options website with those in the USNWRS, the total was 193 NAAI for an inferred response rate of 43.2%, or about 50.9% for both types of institutions together—a robust sample for this population.

The USNWRS was divided into five major categories (Applying, Academics, Student Body, Paying for School, and Technology & Support). These data are self-reported and incomplete, as some institutions did not provide answers in some of the major categories.[5] When N is reported throughout this paper, in each case this represents the number of institutions that responded to that particular question, and no assumptions are made that non-responses are the equivalent of saying that a particular aspect was not present at that institution. Institutions may not have responded to some questions because they were not relevant, because collecting these data was too expensive, or because they did not wish to reveal certain aspects of their program. While this could add some uncertainty to the results from non-response bias, and thus is a limitation, secondary data Is rarely entirely clean; a great deal of value of examining the given data remains.

Throughout this study results are reported relative to the null hypothesis that there are no discernable differences between AAI and NAAI, setting $\alpha = 0.05$. It would be prohibitive to list all of the hypotheses here, but the general idea is that if the null hypothesis can be rejected in a sufficient number of cases, the overall argument that NAAI are in a position to disrupt AAI can be supported. Unless otherwise noted, the reported p values for continuous data were derived using Welch's Test, since this test is robust when the number of observations in each category (AAI vs. NAAI) differs, and the variances are not equal (Frost, 2014). When X^2 results are reported, the p value is from the Pearson Chi-Square test. Ultimately the overall argument is qualitative, but is supported by the weight of the quantitative evidence found. Thus, this study also reported instances in which the null hypothesis could not be rejected so as to provide the complete picture for the reader.

[4] The author purchased access to all of these data for $30 under the premium content plan. Three institutions that recorded themselves as AACSB-accredited proved to have only other accreditations. At the time of data collection, other data sources were less comprehensive. The *Financial Times* (http://rankings.ft.com/businessschoolrankings/online-mba-2012-listing) ranked online MBA programs, but only published data about 16 "top" institutions. *Business Week* (http://www.businessweek.com/bschools/rankings/) provided a list of online MBA programs with no rankings, and all but two of the institutions on its list were present on the other lists considered here.

[5] Three links to the "Academics" pages of three universities produced HTTP 404 (not available) errors over numerous attempts on numerous days. Where possible, data that should have been on these pages was collected directly from the schools' websites.

4. Findings

The following analysis is divided into two overarching sections: areas where significant or noteworthy distinctions were found, and noteworthy areas where there were no discernible distinctions.

4.1. Areas in which significant differences were found

The rankings given by USNWR (using their own unpublished means of weighting various answers) permit analysis at a high level of aggregation. When all the rankings given to the schools in each of the categories in which they may have been ranked are averaged, the average rank for AAI is 57.5 vs. the lower average rank of 90.5 for NAAI [N = 161,$p < 0.0001$]. Generally speaking, this places AAI above NAAI on Fig. 1. Of course, this ranking includes AACSB accreditation and so is biased in its favor.

For the category of Admissions Selectivity alone, the average rank of 19.3 for AAI is significantly different from the average rank for NAAI of 30.7 [N = 40,$p = 0.0175$]. For faculty credentials and training, AAI are ahead (39.5 vs. 51.7) [N = 90,p=.0274]. For student services and technology, differences are not discernible, with the average rank for AAI of 74.6 vs. 85.7 for NAAI [N=161,p.1344]. These categories are indicative of what will be found, but it is necessary to dive deeper in order to see how specific differences line up with the disruptive technologies model.

4.1.1. Admissions and enrollment

The top five NAAI ranged from 2200 to 4475 online MBA students, whereas the top five AAI ranged from 579 to 1302 students. The mean number enrolled was 630 (median 233) for NAAI and 243 (median 170) for AAI [N = 117,$p = 0.0051$]. In addition, NAAI had, on average, significantly more applicants (646 vs. 195 [N = 83,$p = 0.0324$]), more students accepted (467 vs. 126 [N = 84,$p = 0.0232$] at a higher acceptance rate (80.6% vs. 71.4% [N = 82,$p = 0.0195$]), and as a consequence, more new entrants (311 vs. 99 [N = 92,$p = 0.00126$]). Rolling application deadlines for international students were more prevalent for NAAI (92.7%) vs. AAI (72.1%) [$X^2 = 12.4$,df = 1,$p = 0.0004$].

Comparisons of admissions standards give a strong impression that it is easier to get into NAAI:

- Only 31.8% of NAAI denied enrollment to some qualified applicants, vs. 53.5% for AAI [$X^2 = 6.6$,df = 1,$p = 0.0104$].
- About two-fifths (38.3%) of NAAI did not consider undergraduate institution at all in admissions decisions. This was 12.3% for AAI, who considered it more important [$X^2 = 11.7$,df = 3,$p = 0.0085$].
- NAAI were less likely to take recommendations into consideration in making admissions decisions [$X^2 = 10.9$,df = 3,$p = 0.0120$].
- While most (80.0%) of the NAAI did not require standardized test scores for entry, 73.3% of the AAI did require them (mostly GMAT) [$X^2 = 42.0$, df = 1, $p < 0.0001$]. It was much more likely that they were considered in admissions decisions in AAI [$X^2 = 45.75$, df = 3, $p < 0.0001$].
- Mean average GMAT scores were considerably higher (540.9) for AAI (488.4 for NAAI) [N = 56,1-tailed assuming AAI would be higher,$p = 0.0290$].
- AAI required a slightly higher score on the paper Test of English as a Foreign Language (TOEFL) for international students. Whereas virtually every AAI required TOEFL for international students, 11.7% of the NAAI did not [$X^2 = 6.7$,df = 1,$p = 0.0094$].
- However, for some other admissions factors, there were no statistically significant differences between the institution types.[6]

4.1.2. Academic calendar

Perhaps because more of the AACSB-accredited programs were based at business schools that already offered degrees with traditional semesters, that category was by far the most prevalent organizational mode for the academic calendar. More AAI offered semester-based programs, although a large number of NAAI did so as well. More NAAI evidenced flexibility with their programs, opting for lengths from five-to eleven-week or other length terms. When trimesters, quarters, and semesters were grouped as “traditional,” and the other types as “other,” 33.3% of the NAAI used “other” models, versus just 14.7% of AAI [$X^2 = 7.4$,df = 1,$p = 0.0067$].

4.1.3. Student profile

The mean average age of new entrants for AAI was slightly lower (32 years) than for NAAI (35 years) [N = 78,$p = 0.0016$]. Work experience was more likely to be considered “very important” for admissions decisions for NAAI, whereas it was considered “important” or was not considered at all more frequently for AAI [$X^2 = 16.2$,df = 3,$p = 0.0010$]. For both types, students entering with work experience comprised about 89%. Although mean average work experience for AAI was 89.5

[6] These were Undergraduate GPA, Application essay, Character/personal qualities, Applicant's interest level, Interview, Class rank, Alumni/alumnae relations, Geographical residence, and First-generation college student.

months vs. just 29 months for NAAI, this difference was not statistically significant [N = 33,$p = 0.1025$]. NAAI attracted a larger percentages of female students (53.8%, [N = 107,$p < 0.0001$]) and minority students (means of 32.4% vs. 22.2%, respectively [N = 94,$p = 0.0054$]). NAAI on average had 10.5% international students vs. 6% for AAI, though this difference was not significant [N = 74,$p = 0.2619$].

4.1.4. Program costs to students

In almost all categories, AAI were charging more for their courses (Table 1). Most institutions chose to report this data by credit, and for these, AAI were significantly more expensive.

For each of the categories in Table 1, the 75%, 50%, and 25% percentile values were calculated. If an institution was at or above these levels, that value was assigned LOW, MED, HIGH or VERY HIGH for that category. In this way data could be combined for schools that reported costs in credits, by one full year, and by total program. This analysis confirms that AAI were more expensive. The percentages in the HIGH and VERY HIGH categories were significantly higher for full-time, out of state tuition [$X^2 = 17.8$,df = 3,$p = 0.0005$]; part time, in state tuition [$X^2 = 15.5$,df = 3,$p = 0.0014$]; and part time, out of state tuition [$X^2 = 19.6$,df = 3,$p = 0.0002$]. For full-time, in-state, the differences were also large (32% vs. 18%), [$X^2 = 7.5$,df = 3,$p = 0.057$], just barely not significant. The differences for required fees were also significant [$X^2 = 13.1$, df = 3,$p = 0.0044$], but here the percentage of institutions in the HIGH category for NAAI was larger and for MED was lower than those for AAI.

There are also price differentials for in-state and out-of-state consumers. Table 2 shows that for AAI, prices are being raised for out-of-state students in about 23% of the cases, with the opposite being true for about 27% of NAAI. Consolidating the cases into those going up, staying the same, or going down, these differences are significant [$X^2 = 20.655$,df = 2,p < 0.0001].

4.1.5. Programs and concentrations

NAAI were offering more Master's in Business degree programs with more courses and more concentrations:

- Programs: 4.1 vs. 1.8 [N = 161,$p = 0.0006$]
- Courses: 48.8 vs. 25.2 [N = 143,$p = 0.0004$]
- Concentrations: 6.9 versus 5.0 [N = 161,p < 0.0117].

Table 3 shows considerable overlap in the top 10 concentrations by frequency for both types of institutions. No concentration has a lower rank than 15 out of the 41 categories found. These concentrations represent the fundamental majors in the MBA curriculum.

By contrast, the concentrations with significant differences (Table 4) represent niche or emerging topics, such as cybersecurity; others may represent topics where less technical resources are needed to field an on-line program (e.g. leadership).

The total number of times each concentration appeared was tabulated; those in the top third were considered "common," those in the middle "not-so-rare," and those at the bottom "rare." On average, NAAI offered more common concentrations (4.68 vs. 3.10, N = 156,$p = 0.0002$). If it is assumed that NAAI will offer more rare concentrations, then there is almost a significant difference here (1.10 vs. 0.75, N = 156,1-tailed,$p = 0.0587$). Both types of institutions offered about 1.25 not-so-rare concentrations.

About one-fifth of respondents of both types (20.8%) paired international business courses with residencies outside the U.S. The data were examined at a deeper level to see whether the presence of an International Business (IB) concentration would be associated with paired residencies (Table 5). There is a clear difference for NAAI, where most of the institutions that

Table 1
Tuition/fee comparison.

Tuition/Fee comparisons (Mean)[a]	N	*p* value	AACSB accredited	
			No	Yes
Full-time tuition (in-state) (per credit)	124	0.0391[b]	$588	$671
Part-time tuition (in-state) (per credit)	147	0.0224	$576	$677
Full-time tuition (out-of-state) (per credit)	123	0.0004	$583	$763
Part-time tuition (out-of-state) (per credit)	145	<0.0001	$590	$775
Required fees (per credit)	42	0.3279	$118	$76
Full-time tuition (in-state) (per year)	24		$13,331	$9827
Part-time tuition (in-state) (per year)	10		$10,759	$7876
Full-time tuition (out-of-state) (per year)	28		$14,461	$19,343
Part-time tuition (out-of-state) (per year)	12		$8182	$10,244
Full-time tuition (in-state) (total program)	12	0.0096	$23,767	$44,226
Part-time tuition (in-state) (total program)	4		$26,230	$36,700
Full-time tuition (out-of-state) (total program)	11	0.006	$25,100	$41,942
Part-time tuition (out-of-state) (total program)	4		$26,230	$36,700

[a] Data shown in this table has been supplemented, where possible, by data from the websites of the programs that did not report them, with the exception of fee data. In-state is for residents of a given US state such as New York or Illinois; out-of-state is for US residents of other states or international students.
[b] One-tailed assuming AAI higher.

Table 2
Out-of-state and in-state tuition differences using quartiles.

Type	Percentage of institutions in quartile category by institution type, out-of-state to in-state tuition						
Full-time	Same[a]	Higher	Higher	Same	Lower	Same	Lower
Part-time	Same	Higher	Same	Higher	Lower	Lower	Same
Non-AACSB-Accredited	70.73	2.44	0	0	17.07	6.1	3.66
AACSB-Accredited	68.35	15.19	5.06	2.53	5.06	1.27	2.53

[a] Same indicates that prices for out-of-state tuition were in the same quartile as prices for in-state tuition; Higher indicates that they were in one or more quartiles more expensive, and Lower indicates that they were in one or more quartiles lower.

did pair courses and residencies also had IB concentrations [$X^2 = 6.686$,df = 3, $p = 0.0097$]. This would appear to be a specific example of specialization on the part of NAAI, who may be allocating their resources with more focus. For AAI, it may be more important to ensure that "global business" is present across the curriculum, even for non-IB majors.

4.1.6. Instructors and staff

Two results here fit expectations: AAI had a higher average percentage of full-time faculty with a Ph.D. or equivalent (95.0%–77.9%) [N = 117,$p < 0.001$]. NAAI had a much higher number of part-time faculty (59.6 vs. 4.3) [N = 117,$p < 0.0001$].[7] In NAAI, there may be a somewhat smaller likelihood that faculty who taught online also taught on campus. When "none" is grouped with "minority," these differences are significant [$X^2 = 7.8$,df = 2,$p = 0.0204$]. Not as expected was that 88.1% of NAAI required training in online instruction in order to teach online, vs. 58.6% for AAI [$X^2 = 9.2$,df = 1,$p = 0.0025$].

In many other respects significant differences were not detected. The two types of institutions had about the same number of full-time faculty teaching in their programs, and percentages of part-time faculty with Ph.D.'s or equivalent were about the same as well. The average number of years of online teaching experience of those teaching in the programs was about 4.4 (NAAI) to 4.9 (AAI). About 80.6% of the respondents financed training for faculty for teaching online. While the course development staff seemed more numerous at NAAI, these differences were not statistically significant.

4.1.7. Process issues: class size, etc.

While 82.9% of the NAAI reported that degrees could be earned entirely online, only 58.9% of the AAI made a similar claim [$X^2 = 12.0$,df = 2, $p = 0.0024$].[8] A higher percentage of NAAI had programs that required no in-person attendance, while somewhat more AAI had all programs with some in-person attendance required. The statistical evidence here is not significant at the $\alpha = 0.05$ level, but it is fairly strong nevertheless [$X^2 = 5.03$,df = 2,$p = 0.0809$]. Further questions elaborated on what point in the programs in-person attendance may be needed, and here the differences were again significant (Table 6). One-quarter of AAI may have required students to come to campus for orientations, for example.

Institutions were struggling with how to separate on-campus and online students. For about 92.5% of respondents, credits earned online were considered the same as credits earned on campus. There was a minority of 11.6% of AAI that did not consider these credits as equivalent, whereas just 3.4% of NAAI made this distinction, again close to the significance level [$X^2 = 3.425$,df = 1,$p = 0.0642$].

It appears that AAI did want to maintain more of a firewall between online and on-campus courses. When the first three columns in Table 7 are combined as "unrestrictive" policies, and the next two as "restrictive," the distinctions become significant. 81.4% of AAI had more restrictive policies, whereas just 61.9% of NAAI had them [$X^2 = 6.294$,df = 1,$p = 0.0121$].

AAI were more likely to have a large proportion of courses in which collaborative work was required (majority or all vs. minority) [$X^2 = 12.1$,df = 2,$p = 0.0024$]. In 12.8% of all institutions collaboration across online and in-person students was forbidden, and another 49.7% did not have programs or classes aligned where this would be possible. The vast majority of institutions reported most or all curricula for online and campus students to be the same. Only nine institutions were trying to field courses in their online programs that were different, and all of these were AAI. Rarely did either type of institution engage outside firms to design their course software; the overall percentage here was about 5.1%. About half (50.6%) of all respondents did use courses designed by certified instructional designers.

Just 50% of NAAI used "Delivery modes: live streaming video," whereas 66.7% of AAI did so [$X^2 = 4.3$,df = 1,$p = 0.0377$]. Other differences were not significant. Only a small minority of respondents reported that all of their classes were live online, and 62.3% of the respondents fielded no live courses at all.[9] 75% of respondents said that all of their courses are available in recorded form online, with another 8.3% saying a majority were.

[7] For just this variable, University of Phoenix was excluded as an outlier. They reported 4681 part-time instructors, more than 10 times greater than the next highest institution.

[8] Recall that the cutoff in the USNWR survey for "fully online" was 80%. This is reasonable because it does allow institutions with some blending to be included.

[9] About 75.1% of respondents reported that most or all of their courses are in the category "live online/on-campus after 5 p.m.," so most of these institutions must have been reporting in-person classes after 5 p.m.

Table 3
Top 10 ranked concentrations for each type of institution.

Concentration	Non-AACSB accredited		AACSB-accredited	
	N	Rank	N	Rank
General management	63	1	51	1
Finance	42	5	37	2
Accounting	43	4	32	3
Marketing	38	8	32	4
Management information systems	25	9	28	5
International business	39	6	26	6
Supply chain management/Logistics	16	10	20	7
Entrepreneurship	15	11	19	8
Production/Operations management	12	15	14	9
Human resources management	45	2	12	10
Health care administration	39	7	12	11
Leadership	44	3	11	14

Table 4
Concentrations with significant differences by institution type.

Concentration	Non-AACSB accredited, N	AACSB-accredited, N	Percentage of total that was non-AACSB-accredited	Significance
Conflict Management	4	0	100.0%	$X^2 = 19.481, p < 0.0001$
Public Administration	12	1	92.3%	$X^2 = 27.713, p < 0.0001$
Economic Crime and Fraud Management/ Security/Cybersecurity	9	1	90.0%	$X^2 = 28.244, p < 0.0001$
Sports Business	9	1	90.0%	$X^2 = 9.688, p = 0.0019$
Project Management	13	3	81.3%	$X^2 = 6.534, p = 0.0106$
Leadership	44	11	80.0%	$X^2 = 6.512, p = 0.0107$
Human Resources Management	45	12	78.9%	$X^2 = 6.512, p = 0.0107$
Not-for-profit Management	14	4	77.8%	$X^2 = 5.844, p = 0.0156$
Health Care Administration	39	12	76.5%	$X^2 = 3.952, p = 0.0468$
Manufacturing and Technology Management	4	11	26.7%	$X^2 = 3.897, p = 0.0484$

Table 5
Extent of Pairing of IB courses and residencies abroad.

No. of institutions	Non-AACSB-accredited		AACSB-accredited	
Paired/Did not pair international business courses with residencies outside the U.S.	IB indicated as concentration	IB not indicated as concentration	IB indicated as concentration	IB not indicated as concentration
Did not pair	27	36	18	37
Paired	12	3	6	10
Percent paired	30.7%	7.7%	25.0%	21.3%

Mean average class sizes for NAAI was reported to be 14.1, versus 25.4 for AAI [$N = 122, p < 0.0001$]. The mean maximum size for AAI was almost 14 students higher, at almost 36 [$N = 118, p < 0.0001$]. Instructors at NAAI provided practically twice as many office hours per week [$N = 102, p = 0.0166$]. A much larger average proportion of classes at AAI were lectures (74.0% vs. 39.9% [$N = 144, p < 0.0001$]). Most (85.9%) of AAI used simulations as one teaching mode, versus 67.9% of NAAI [$X^2 = 6.7$,df $= 1, p = 0.0098$]. Simulations are exercises that use real-world based scenarios to help students activate passive knowledge (Neely & Tucker, 2013).

Faculty at NAAI provided feedback to students on participation 5.1 times per month, a not quite significant difference from 3.8 for AAI [$N = 83, p = 0.0554$]. Almost all the respondents (96.0%) noted that class participation was graded. Students at all institutions were required, on average, to login about 2.5 times per week, and faculty evaluated student participation about 5.4 times per month.

4.1.8. Ensuring academic integrity

Not many significant differences can be found in this category. AAI were much more likely to adopt an honor code [$X^2 = 6.7$, df $= 1$, $p = 0.0098$], but NAAI were more likely to use anti-plagiarism software [$X^2 = 6.2$, df $= 1$, $p = 0.0127$]. (About

Table 6
Percentage of institutions where it was possible that in-person attendance would be required.

	Orientations	Classes	Group projects/simulations	Exams
Non-AACSB-accredited	7.3%	4.9%	3.7%	7.3%
AACSB-accredited	25.3%	17.3%	13.3%	17.9%
Significance	[$X^2 = 9.5$, df = 1, $p = 0.0021$]	[$X^2 = 6.3$, df = 1, $p = 0.0121$]	[$X^2 = 4.8$, df = 1, $p = 0.028$]	[$X^2 = 4.1$, df = 1, $p = 0.0421$]

Table 7
Policies for online enrollment.

Type	No. of institutions				
	Students do not enroll as online	Students enroll as online, but			Online and on-campus students are in separate courses
		can take classes on campus without notification	can apply to switch course enrollment to campus-based	they are bound to courses as online students after enrollment	
Non-AACSB-accredited	10	11	3	9	30
AACSB-accredited	3	4	6	13	44

Table 8
Recommend and required internet connections.

Percentage of all respondents/AACSB-accredited	28k or 56k		128k or 256k		Cable, DSL, or T1	
	No	Yes	No	Yes	No	Yes
Recommended Internet connection	3.9%	2.0%	6.5%	4.6%	41.2%	41.8%
Required Internet connection	20.4%	11.8%	10.5%	15.1%	20.4%	21.7%

half of all the respondents (50.7%) required new entrants to review and sign an ethics statement,[10] a percentage that did not differ significantly by institution type.) Another question asked whether anti-plagiarism software was required for essay assignments; in this question there were no discernible institution type distinctions; about 76% of all respondents said it "depends." About 14.3% said it is required, and 9.7% said it is not required.

Almost the same percentages of both types of institutions (about 14%) monitored online exams visually. However, no NAAI excluded online exams entirely, whereas 7.3% of AAI did. The vast majority of each permitted unmonitored online exams. There were essentially no differences when it came to the number of settings in which in-person exams were administered. Here, about 49% of respondents said they had no proctored exams. Of the rest, about 11.6% permitted them in just one geographical setting, whereas about 38.7% permitted them in multiple geographic settings.

4.1.9. Career services support

AAI were much more likely to have dedicated business school career centers (44.3% vs. 16.0%) [$X^2 = 14.2$,df = 1,$p = 0.0002$]. Only 73.6% of NAAI offered access to university-wide career services, versus 89.7% for AAI [$X^2 = 5.9$,df = 1,$p = 0.0144$]. Combining three questions on this subject from the USNWRS, 90.4% of AAI offered access to some form of career services vs. 70.7% for NAAI [$X^2 = 9.153$,df = 1,$p = 0.0025$].

4.1.10. Graduation and retention rates

The AAI seem to have higher mean average 2–3 years graduation rates (58% vs. 43% for 2009 [N = 50,$p = 0.0399$] and 59% vs. 45% [N = 60,$p = 0.0404$] for 2010). For 2011 the difference narrowed and ceased being statistically different (56% vs. 48%) [N = 70,$p = 0.1727$]. Retention is considered to be an important metric for the success of online programs (Geri & Gefen, 2007). AAI were typically about 3% above NAAI on this metric, although the differences were not statistically significant.

4.2. Areas in which no significant differences were found

4.2.1. Technology required

In the age of almost ubiquitous broadband access to the Internet, one might assume that online MBA programs would be built around high speed connections. That may be true for the most part, but a significant number of respondents (32.2%) did not require anything more than a 56k or 128k connection—in other words, a dial-up modem (Table 8). The differences by institution type are not statistically significant, but the overall percentages are quite interesting. In isolation, the fact that

[10] Since this item was grouped under "Technology & Support," it could be that the ethics statement was principally concerned with acceptable computer use.

Table 9
Difference by supported technologies.

Technology supported[a]	Non-AACSB-accredited			AACSB-accredited		
	YES	NO	Percentage YES	YES	NO	Percentage YES
Delivery modes: Recorded video	74	6	92.5%	75	1	98.7%
Delivery modes: Recorded audio	75	5	93.8%	73	4	94.8%
Delivery modes: Bulletin boards	68	9	88.3%	69	6	92.0%
Student-student engagement: Online chatrooms	58		(70.7%)	64		(81.0%)
Student-student engagement: Web conferencing (webinars)	39		(47.6%)	52		(65.8%)
Student-student engagement: Skype or other visual software	36		(43.9%)	52		(65.8%)
Delivery modes: Live streaming audio	39	39	50.0%	48	25	65.8%
Delivery modes: Software-based readers	44	32	57.9%	43	28	60.6%
Delivery modes: Online labs	41	36	53.2%	33	37	47.1%
Delivery modes: Application for display on Smartphone	31	46	40.3%	28	41	40.6%
Delivery modes: Application for display on tablet computer	33	42	44.0%	26	41	38.8%

[a] Delivery modes questions had explicit yes/no choices; engagement questions did not.

almost twice as many NAAI as AAI required just the lowest speed connections seems indicative. Overall, 83.0% of respondents recommended a high speed connection, but only 42.1% required it.

4.2.2. Forms of support provided

Table 9 shows the responses for other technologies and delivery modes. There are again no significant differences, with one caveat. If it is assumed, for example, that all of the non-answers (nothing at all checked) for Skype should be interpreted as "no," then there is a significant difference, with AAI more likely to use it [$X^2 = 7.8$,df $= 1$,$p = 0.0052$]. The same would be true for the use of web conferencing (webinars) [$X^2 = 5.5$,df $= 1$,$p = 0.0195$].) Almost all respondents used recorded video and audio. Only about 40% overall supported tablet computers or smartphones.

Anywhere from about 75% to 97% of both types of institutions provided support for E-mail address, Access to digitized library materials, Technical support, Academic advising, Financial aid office/services, and Access to live librarian—there were no significant differences here. A second group of services came in at about 40% of all the institutions, regardless of type: Live tutoring, Local area network, Writing workshops, and Mentoring.

For the most part, differences between the institution types cannot be detected for when support is available. 92% always provided weekday daytime support, dropping to 80% for weeknight evenings, and 61% for weeknights overnight. Recoding the weekend days to either "always" or "not always" shows that AAI are more likely to provide consistent weekend day support [$X^2 = 4.169$,df $= 1$, $p = 0.0412$].

4.2.3. Learning management system

About 73% of institutions used a proprietary LMS, about 12% used open-source and 15% used both; there were no differences by institution type.

5. Discussion

By systematically examining the USNWRS data, this study has found a number of instances where the null hypothesis can be rejected ($\alpha = 0.05$), meaning that there are significant differences between AAI and NAAI. Table 10 organizes these findings according to assumptions that were discussed in Section 2. Most of these findings confirm expectations.

For the most part, it has been found that the AAI are offering online MBAs in ways that highly resemble their existing programs. They are still going for a more traditional MBA student population with initial work experience before enrolling in the MBA programme. To a large extent they are stuck in a traditional mode of having to offer higher prices to out-of-state/international applicants. Ph.D. faculty may resist the idea that they need additional "training" to teach online. In some ways, they are offering "gold-plated" versions of online MBAs, with more in-person (blended) attendance, and access to more services. At the same time they do have larger class sizes, and more use of traditional forms such as lectures.

In most respects, the NAAI are making use of online technologies in an initial, disruptive mode. It does seem that they are going after a somewhat different student population, they are less expensive (possibly mitigated by some higher fees), and they offer lower prices to out-of-state/international consumers. They train part time faculty, make it easier to earn degrees entirely online, and to a certain extent use less demanding technology. Results, expressed as retention rates, may be somewhat worse. In a few respects, they may have started to innovate up. Here this study found smaller class sizes, niche concentrations, and an example of fine-tuning in the IB curriculum.

At the same time, one rather large area (with a few exceptions) in which differences were hard to identify should be noted: the use of the information technologies themselves. For example, one might have thought that the challengers would only use recorded audio or video, whereas the incumbents, making sustaining use of the technology, would pay the cost (and charge the price for) live streaming audio and video. This may be true to a small extent, but the absence of such distinctions may

Table 10
Consolidated results.

Stakeholders	Disruptive vs. Sustaining use of "online" technologies	
AACSB-accredited institutions	**Disruptive** A Small number of AAI kept credits and programs entirely separate, raising possibility they were trying to create separate units for delivering online programs	**Sustaining** Lower acceptance rate, more stringent entrance requirements, age slightly younger but more work experience Higher out-of-state/international prices More full-time faculty with PhD or equivalent degrees, but less online instruction training More in-person attendance, use of lectures, use of simulations More use of live streaming video, skype/webinars (weaker evidence) More firewalls between online and in-person students, but more blended classes Larger average/maximum class sizes More use of honor codes More access to career services, weekend support
Non-AACSB-accredited institutions	**Disruptive** Larger number of students, more diverse (women, minorities, ~international), less stringent entrance requirements, slightly older age, less work experience Less expensive (may have higher fees), out-of-state/international cheaper than in-state Offering standard concentrations More part-time faculty, faculty teaching online less likely to also teach on campus, more instruction in online teaching Easier to earn degree all online, but fewer firewalls with traditional courses Less live streaming video, weak evidence of less stringent internet connections at low end More use of anti-plagiarism software Less overall support	**Development of low level technology** Smaller class sizes More use of non-traditional program length New concentrations in niche area (example of fine-tuning IB concentration with pairing overseas experiences)

represent a combination of the overall low cost of information technology for non-incumbents, and a bow to the realities of available technologies, for the incumbents.

Another way to look at this is to consider that at present, information technology is still relatively limited. The rapid pace of improvements could mean that in just a few years, synchronous technology may be so effective and pervasive as to deliver as much as the live classroom can deliver, and more (Duderstadt, Wulf, & Zemsky, 2005). At this point there may be another technology gap that may separate challengers from leading incumbents who are willing to provide a very high-priced experience to their limited clientele (perhaps virtual reality?).

6. Conclusion

This study has contributed a detailed examination of how online programs at non-AACSB accredited institutions (NAAI) differ from those at AACSB-accredited institutions (AAI). It should provide ample food for thought for anyone involved in higher education or thinking about how the information technologies can disrupt traditional incumbents. Although the study is limited by the use of US data, the Internet makes disruption possible from anywhere, and similar issues must be faced by business schools around the globe. This study has contributed a case study that shows the overall applicability of the theory of disruptive innovation (Christensen, 1997). Though details differ, it is clear that the inexorable rise of digitization is opening an opportunity for "lesser" institutions to challenge the leaders in ways that could not have been conceived a few years ago. Future work should include performing similar analyses for business schools with other forms of leading accreditation in order to further understand how MBA education is open to disruption.

As more and more universities decide to take individual courses, certificates, degree completion sequences, and entire majors and programs online, one wonders: just how disruptive will the computer and communication technologies be for this industry? What makes higher education in general, and MBA programs, in particular, quite different from other industries that have seen widespread disruption, is the large number of institutions involved. Each has a relatively small market share. But even this is changing, if institutions such as The University of Phoenix can successfully serve 60,000 on-campus and online MBA students (The Economist, 2010). While it is not necessarily fruitful to view individual institutions, they can be conceptualized using a wave metaphor. Up close, each institution looks like a ripple, but seen from a distance, they take on the characteristics of a large wave.

The rise of Massive Open Online Courses (MOOCs), available at no or low cost to thousands of students, represent a different threat if they force programmes to be unbundled (e.g. Daly, 2013; Kolowich, 2013a, 2013b; Richardson, 2010). Students may seek the ability to mix and match courses to fill in gaps, speed up their programs, increase convenience, reduce difficulty, enhance their learning, and/or reduce costs. Imagine a new world of higher education in which a Google-like

infomediary provides a "super-catalog" of courses, listing them by topic; contents; degree/program; starting-ending dates; whether they can be started, stopped, and finished later; learning efficacy; class size; professor/instructor rating; cost; difficulty; prerequisites, etc. If this catalog directs the student to a course offered from Bangalore, and the student is able to learn the needed material at half the cost in half the time, why wouldn't the student want to take the course?

Stanford's artificial intelligence MOOC, offered in 2011–2012, can be considered one of the first examples of university-level unbundling (Perry, 2012). However, it did not result in any credential besides a certificate. Neither do any of the 1000's of instructional videos now offered by the Khan Academy on YouTube. So a substantial aspect of this emerging new ecosystem for higher education would have to be how the course is credentialed (e.g. Biliczky, 2012). Georgia Tech is offering a MOOC-based graduate computer science degree, which shows one way in which institutions may co-opt this movement (Daly, 2013).

For MBAs, something like AACSB accreditation, if adapted to the individual course level, could provide a means of unbundling. However, if the AACSB itself is part of the incumbent ecosystem, there is reason to think that new forms of credentialing could rise up "from below" to displace it. The concept of "stackable credentials" (Marcus, 2012) has been in existence for a number of years, in which documentable life (work) experiences, certifications, and other forms of achievement can "count" as leading to a degree. As of mid-2016, the EFMD Global Network is in the process of rolling out accreditation for individual online business courses under the EOCCS name (EFMD Global Network. (2016a)).

A group of NAAI have started down the path of fully online MBA degrees; some of them will surely break out of the pack with the types of innovation (and lower prices) that could bring them sizeable numbers of students. For traditional incumbents who are having difficulty with departmental barriers and other trappings of the traditional model, it may be crunch time to adapt or die a surprisingly swift death. The age of "fully online" is upon us whether we like it or not, so the only remaining question is how change can be embraced in the most productive and satisfying manner possible.

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