

## **Technology and Business Aspects of E-Business Education**

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### **Abstract**

*The present study investigated the extent to which future e-business professionals are being prepared for the technical as well as non-technical aspects of this form of commerce. University technological and non-technological course content was investigated for 153 e-business degree program curricula based in different parts of the world. Data were collected from university web pages for bachelor's and master's degree programs. Courses were categorized according to their focus on the following types of subject matter: technology, e-business, or non-technological business skills. Results suggested sampled programs based in North America tended to include more non-technological business coursework while those based in Europe were moving toward more e-business and technical course coverage. Findings further suggest that e-business education could be adapting to local needs and conditions.*

**Keywords:** e-business education, global e-business, e-commerce education, e-business

### **1. Introduction**

Demand for e-skills has increased dramatically around the world as technology is increasingly incorporated into all aspects of business practice. While high levels of unemployment characterize many sectors of the economy, there is a critical shortage of ICT-skilled workers for businesses in Europe (European Commission, 2014). The European Commission (2014) estimated as many as 900,000 unfilled ICT practitioner vacancies in the EU by 2015. Likewise, U.S. News and World Report Money (2014) identified a number of jobs related to e-business in their 100 Best Jobs list, for example: information security analyst (ranked 11) and database administrator (ranked 12). Based on a survey of 363 executives across a variety of industries in eight countries, Oxford Economics (2011) reported that 71 percent identified difficulty in finding skills as a moderate or serious risk to the digital transformation of their businesses. The survey results further indicated 73 percent of the respondents identified lack of understanding of the benefits as a risk to successful digital transformation. An Organization for Economic Co-operation and Development (2010) report suggested that the Internet is transforming existing value chains and business models. The report identified development of ICT skills and employment as the number one ICT policy priority for economic recovery in OECD countries. Pilinkiene, Kurschus, and Auskalnyte (2013) pointed out the cost-related and technical benefits associated with doing e-business. Education is needed to help organizations to take advantage of these opportunities by enhancing skills for identifying opportunities and applying technology effectively as new markets and technologies develop.

## 1.1 E-Business Education

Universities around the world have responded to the demand for education in the area of e-business. Research has documented the growth and nature of e-business education at the bachelor's and master's levels in the U.S. and in other parts of the world (Burkey, 2007; Durlabhji & Fusilier, 2005; Fusilier & Durlabhji, 2005). Technology-focused educational topics for e-business are those traditionally offered by computer information systems programs, for example, a course in "Database Management." However non-technological aspects of business such as a lack of branding can account for e-business failure (Koumpis, 2014). Likewise the non-technological activity of building customer trust is an important influence on customers' decisions to purchase online (Velmurugan, 2009).

Curricula for e-business education therefore include coursework on both technological topics and non-technological business subjects. Evidence suggests that curricula appear to include more non-technological, required business courses, on average, than technologically-oriented required courses (Burkey, 2007). Non-technological business courses include traditional marketing, management, accounting, etc. that do not have a particular focus on e-business or technology. Fusilier and Durlabhji (2013, 2008) reported that curricula based in North America tended to require more business courses than programs based in other parts of the world. The larger proportion of business courses may be a reaction to the dot-com crash of 2001 when online business failures were typically attributed to lack of managerial attention to non-technical factors such as inadequate business models (Hirakubo & Friedman, 2002). Over-emphasis on non-technological subject matter might result in neglect of e-business content in curricula (Fusilier & Durlabhji, 2008; Kotb & Rober, 2011) which could account for findings of inadequate e-business practice, for example, the security vulnerabilities detected in up to one-third of Fortune 500 corporations' retail e-commerce (Zhao & Zhao, 2012). Topics such as IT-business process integration and e-business strategy are not traditional business subjects but have repeatedly emerged as drivers of e-business success (Eikebrokk & Olsen, 2007; Kim, Song, & Koo, 2008). It seems that e-business curricula could be strengthened by including coverage of such non-traditional topics.

## 1.2 Purpose of the Study

To what extent do e-business degree programs cover technology-focused versus non-technological subject matter? The present study addressed this issue with regard to e-business programs around the world. Data from master's and bachelor's degree programs were used to (1) investigate the average numbers of non-technological business and e-business courses as well as technology-focused and technological e-business courses in curricula, and (2) compare the course types in programs according to the continents on which the programs are based. Data were collected from the e-business degree programs that currently exist and were identified in the compilations of e-business degree programs reported by Fusilier & Durlabhji (2008a), Durlabhji and Fusilier (2005), and Fusilier and Durlabhji (2005).

## 2. Method

Data collection followed the list of e-business master's programs identified by Fusilier and Durlabhji (2008a) and bachelor's programs identified in Durlabhji and Fusilier (2005) and Fusilier and Durlabhji (2005). Curriculum information was obtained from universities' e-business degree program web sites.

### 2.1 Course Coding

Program curricula were examined according to the (a) number of technology-focused courses included in the program, (b) numbers of technological and non-technological e-business courses, and (c) number of business courses that did not have a focus on technology. Course titles and descriptions were examined in making the categorizations. Courses were also classified as required or elective. The specific method used for assigning courses to the categories follows:

- **Business:** Regular business offerings found in traditional business programs, such as accounting, finance, etc. were included in this category. Examples of actual course titles coded as Business include "Cost Analysis", "Administrative Principles", and "Supply Chain Management".
- **Technological e-business:** Courses specifically incorporating e-business/Internet in their titles and also "technical" in nature were classified as e-business - technical. Examples include "E-commerce Technology", "Web Programming and Design."

- **Non-Technological e-business:** This designation was used for courses that contained e-commerce/Internet in their titles but were non-technological in that they focused on functional areas, such as e-marketing, e-management, and legal issues in e-commerce. Examples of course titles include “Principles of Internet Marketing”, and “Legal Issues in E-commerce.”
- **Technological:** Courses that traditional computer information systems programs typically offer and other courses that presume a technical background were categorized as technical courses. Examples include “Database Management” and “Practical Computer Architecture.”

### 3. Results and Discussion

#### 3.1 Numbers of E-Business Degree Programs

Numbers of e-business degree programs included in the sample by the continent on which they are based are presented in Table 1. Data collection resulted in 116 curricula from the master’s programs originally identified by Fusilier and Durlabhji (2008a). This is 71 percent of the list of 163 compiled Fusilier & Durlabhji (2008). It therefore appears that 47 of the schools on the earlier list discontinued their master’s programs in e-business. It is not uncommon for e-business degree programs to be revised or discontinued (Fusilier & Durlabhji, 2008b; Fusilier & Short, 2011). Of the 94 bachelor’s programs identified by Durlabhji and Fusilier (2005) and Fusilier and Durlabhji (2005), 37 programs could still be found in the present data collection effort that had full curriculum listings. Fusilier and Short (2011) surveyed faculty and administrators: main reasons for e-business program discontinuation included an integration of e-business concepts into existing coursework and low student enrollment in such degree programs. Means and standard deviations are presented in Table 2 for each course type by continent on which the programs are based.

**Table 1: E-Business Degree Programs by Type and Location**

Type/Location	North America	Europe	Asia	Australia and New Zealand	Total
Bachelor’s	27	3	0	7	37
Master’s	58	27	8	23	116
Total	85	30	8	30	153

**Table 2: Means and Standard Deviations by Course Type and Program Location, All Programs**

Continent	North America		Europe		Asia		Australia/NZ	
	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
Required Course Type								
Business	7.81	5.76	2.73	3.22	1.50	3.12	5.90	7.01
Technological e-business	1.44	1.80	3.03	3.32	2.50	1.60	1.03	1.27
Non-Teche-business	1.81	1.94	1.97	1.54	1.50	1.07	1.17	1.15
Technology-focused	2.80	3.14	4.07	4.84	1.50	1.69	1.80	1.50

#### 3.2 Course Types by Continent

Multiple regression analysis was applied to compare categories of required courses across the continents in which the programs were based. A separate equation was computed for each of four dependent variables: the number of required courses in a program coded as (a) business, (b) technological e-business, (c) non-technological e-business, and (d) technology-focused. The predictors of these dependent variables were the type of program (bachelor’s or master’s) entered into the equation first and dummy-coded continent variables, entered next. The North American sample was coded as the reference group so that the regression coefficients in the equation provided a comparison between the North American sample and each other continent represented. Further comparisons between the other pairs of continents were made using t-tests for differences between the regression coefficients (Cohen & Cohen, 1983).

A statistically significant difference was detected for the dependent variable of required business courses between sampled programs based in North America and those based in (a) Europe and (b) Asia. See Table 3. Programs sampled that were based in North America apparently required more business courses. Further statistically significant findings suggest more required technological e-business and technology-focused courses for the programs based in Europe versus North America. See Tables 4 and 5.

**Table 3: Multiple Regression Results for the Dependent Variable: Required Business Courses**

Variable	Beta	R	Adj. R <sup>2</sup>	F	R <sup>2</sup> Change
<i>Step 1: Program type</i>					
Bachelor's versus Master's	-.58**	0.58	0.34	78.07**	0.34**
<i>Step 2: Continent dummy variables</i>					
Europe vs. North America	-3.50**				
Australia/NZ vs. North America	-1.32				
Asia vs. North America	-4.01**	0.63	0.39	24.87**	0.06**

**Table 4: Multiple Regression Results for the Dependent Variable: Required Technological-Business Courses**

Variable	Beta	R	Adj. R <sup>2</sup>	F	R <sup>2</sup> Change
<i>Step 1: Program type</i>					
Bachelor's versus Master's	-.04	0.02	0.01	0.06	0.01
<i>Step 2: Continent dummy variables</i>					
Europe vs. North America	0.30**				
Australia/NZ vs. North America	-.38				
Asia vs. North America	1.14	0.33**	0.08	4.471**	0.11**

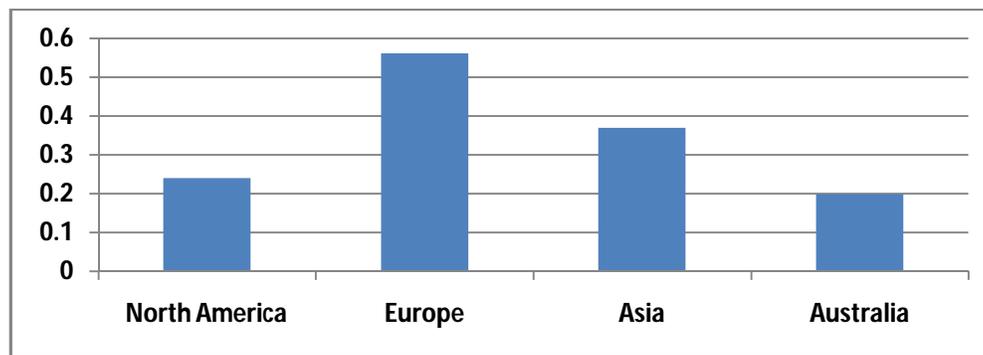
**Table 5: Multiple Regression Results for the Dependent Variable: Required Technology-Focused Courses**

Variable	Beta	R	Adj. R <sup>2</sup>	F	R <sup>2</sup> Change
<i>Step 1: Program type</i>					
Bachelor's versus Master's	-.41**	0.38	0.14	25.05**	0.14**
<i>Step 2: Continent dummy variables</i>					
Europe vs. North America	0.24**				
Australia/NZ vs. North America	-.02				
Asia vs. North America	-.09	0.46	0.19	10.13**	0.07**

Results of Fusilier and Durlabhji (2008a) identified only one difference: more required business courses in the sampled North American programs versus those in Europe and Australia/New Zealand. The present results suggest that European programs sampled are moving toward more technological e-business and technology-focused coursework relative to North America. This may reflect an effort to address the possible deficit in coverage of e-business topics pointed out in the earlier literature (Fusilier & Durlabhji, 2008; Kotb & Roberts, 2011).

Figure 1 shows required technology-focused and technological e-business courses as a percentage of the total required courses for programs on each continent. Both bachelor's and master's degree programs were included in the analysis. Results of z-tests suggest the programs based in Europe have proportionately more technological content than those based in (a) North America ( $z=3.86$ ,  $p<.01$ ) and (b) Australia ( $z=3.52$ ,  $p<.01$ ). Viewed in the context of previous literature (Fusilier & Durlabhji, 2008a), the emphasis on technology-focused coursework continues to be greater for programs in other parts of the world than for those situated in North America. The relatively stronger technology-focus among European programs suggests efforts to meet the current high demand for ICT workers in business, healthcare, and government documented by the European Commission (2014). On the basis of the multiple regression analysis results, program type and continent explained up to 39 percent of the variance in the dependent variables. This finding supports the conclusion of Rosli and Azizi (2009) that e-business practice and education across countries is an exciting area for further investigation. Differences in curricula across continents suggest adaptation to local needs and conditions.

**Figure 1: Required Technology-Focused and Technological e-Business Courses as a Percentage of Total Required Courses in E-Business Curricula by Continent**



Findings suggest that e-business education continues to evolve with evidence that a number of programs that were identified on the 2008 and 2005 lists no longer existed on school web sites (Fusilier & Durlabhji, 2008; Durlabhji & Fusilier, 2005; Fusilier & Durlabhji, 2005). E-business degree programs at one time were a new and different attraction for students. The current findings may reflect a growing acceptance of e-business as a way of life and a topic that is covered in almost every business course today.

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