

# Information Technology in the British and Irish Undergraduate Accounting Degrees

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## Abstract

Using an online questionnaire and a series of semi-structured interviews, this study seeks the perceptions of accounting educators and professional accounting bodies in the UK and Ireland on the status quo of technological developments within accounting curricula and the factors influencing this status quo. Findings suggest a fairly widespread view that technological developments represent an important area that should be covered *across* accounting curricula, to expose changes in the marketplace and to enhance the employability of graduates. However, it is still a *peripheral component* in accounting curricula, with no clear agenda for change. Professional accounting bodies seem to play a hegemonic inhibiting role through accreditation requirements although other inhibitors were reported such as lack of competent/interested staff and lack of time/space in already overloaded syllabi.

**Keywords:** IT, accounting curricula, professional accounting bodies, accreditation, hegemony, ideology

## 1. Introduction

The world is being transformed by a series of profound technological changes dominated by digital – a ‘second machine age’ ... over the next two decades some economists have estimated that 35% of current jobs in the UK could become automated (p. 6) ... Universities need to be encouraged to work in partnership with industry, to make sure relevant courses are aligned with employer needs ... [and] to ensure that all graduates are digitally competent (House of Lords, 2015, p. 11-12).

The today’s digital economy is driving major changes in the way in which businesses operate and is increasingly becoming a way of life for all types of businesses. Between 2010 and 2014, the number of digital businesses grew at a faster rate than the total number of businesses in the United Kingdom (UK) (Department for Digital, Culture, Media & Sport, 2017). A number of industries have already been shaken as a result of new business adventures, supported by digital technologies, for example Uber in transportation, Airbnb in tourism and the coming impacts of self-driving cars and the use of drones for goods delivery in a number of industries. Such economy has resulted in the loss of several conventional jobs but has created new jobs for ‘new-collar’ workers, combining digital skills with their *conventional* education. For example, Goldman Sachs used to employ 600 equity traders at its headquarters in New York. However, due to computerisation, many of these jobs have been replaced by IT specialists – out of 600 traders, only two are left today (Byrnes, 2017). The accounting world is certainly no exception. The accountancy profession is ranked fourth, with 94% probability, among the occupations susceptible to computerisation (Frey & Osborne, 2017).

As such, it can be argued that today’s graduates are highly expected to possess a different set of knowledge and skills from that of earlier generations, who entered a job market characterised by manual operations or even simple computerised systems (Boritz & Stoner, 2014; Kotb & Roberts, 2011). For instance, Vasarhelyi et al. (2010a) argue that traditional accounting education focuses on knowledge of concepts and rules which is not enough for students to function in a digital economy. They advocate that accounting education ‘must shift students’ attitudes, behavior, and objective knowledge’ (p. 415). In support of this, 12% of PricewaterhouseCoopers’ (PwC) (a Big Four accounting firm) hires in 2015 were not accounting graduates; rather, they had engineering, science, technology or math degrees (PwC, 2015), possibly emphasising the importance placed by accounting firms on technological and analytical skills. The International Federation of Accountants (IFAC, 2007) issued the International Education Practice Statement (IEPS No. 2) to set out the core IT knowledge and skills areas and competency elements that *all* professional accountants require to possess before they could work in complex IT-related areas.

With this in mind, given their role in society, universities are arguably expected to lead the way as the accounting landscape changes. The House of Lords (2015) Report: *Make or Break: The UK’s Digital Future* warns that a UK shortage of digital skills has reached a ‘tipping point’ (p. 7), calling for ‘future-proof’ young people provided with essential digital skills for their future careers. In doing so, the report states that: ‘... universities should ensure that all graduates are digitally competent’ (p. 12).<sup>1</sup> Yet, there is a question to be asked

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<sup>1</sup> Although the House of Lords (2015) Report does not clearly define the term “Digitally Competent”, we believe it refers to that university graduates should be able to keep abreast with the rapid changes in the area of information and communications technologies (ICT), developing a related set of knowledge and skills that make them able to exploit various ICTs efficiently in their own personal and professional life.

here: *to what extent are universities adequately responding to the urgent need for reskilling?* Although there have been several calls over the years to integrate IT into accounting curricula, prior research suggests that university accounting education is lagging behind business practice, failing to equip students with the knowledge and skills required to prepare them for their future careers (see, for example, Albrecht & Sack, 2000; Humphrey, 2005; Humphrey et al., 1996; Kotb & Roberts, 2011; Spraakman, 2011). As such, the position of technological developments in undergraduate accounting curricula in the UK and the Republic of Ireland (ROI) is not clear.<sup>2</sup> No research has examined the coverage of technological developments in British and Irish undergraduate accounting degrees.

Accordingly, the present study aims to address this apparent gap by investigating (i) the current status of technological developments coverage in undergraduate accounting curricula; and (ii) the factors influencing this status, by soliciting the views of the two influential players in designing and delivering the content of undergraduate accounting syllabi in the UK and ROI: professional accounting bodies (as the profession's gatekeepers and representatives of employers) and accounting educators (as trustees for the profession integrity). This was achieved by analysing the views of accounting educators collected through 212 usable and completed online questionnaires followed by 17 semi-structured face-to-face interviews, and five semi-structured face-to-face interviews with professional accounting bodies.

This study makes a number of contributions. First, to the best of the authors' knowledge, this is the first study that solicits accounting educators' and professional accounting bodies' views on technological developments coverage in British and Irish undergraduate accounting degrees. Second, while prior research has covered issues such as ethics and social and environmental accounting, the present study covers technological developments: a topic that may have serious consequences for the future of accounting education and the profession. Third, this study extends the ongoing debate on the link between accounting education and practice. This debate has been at the core of a number of studies (e.g. AAA, 1986; Langenderfer, 1987; Lee, 1989; Lothian, 1985; Sterling, 1973; Wells, 1987; Wolk & Briggs, 1975; Zeff, 1989). Finally, the scale of the empirical study covers UK and ROI universities, supports the external validity of the study's findings.

The next section provides the background to the study. This is followed by a discussion of the theoretical underpinning. Section 4 outlines the data collection process. The penultimate section presents a discussion of findings of the online questionnaire and semi-structured interviews. The paper concludes with a further discussion of the results and their implications for undergraduate university accounting education.

## **2. Background**

Over the past three decades, the debate concerning what employers demand and what universities offer has attracted the attention of accounting professional bodies, academics, researchers and practitioners. A common conclusion of several reform reports in this regard (e.g. AAA, 1986; AICPA, 1987, 1988; Arthur Andersen & Co. et al., 1989; AECC, 1990; IFAC, 1996; Albrecht & Sack, 2000) was that most accounting degree programmes were not dynamic enough to meet in time the rapid changes in the business environment, creating an increasing

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<sup>2</sup> Kotb and Roberts (2011, p. 78) states that ROI education system 'is very similar to that of England and the professional body, the Institute of Chartered Accountants in Ireland (ICAI), and the academic body, the British Accounting and Finance Association (BAFA), cover both Northern Ireland (which is part of the UK) and ROI'.

perceived skills gap between: *how accounting is practised* and *what is taught in universities*. Today, the gap still exists; rather, it is widening, where businesses are becoming increasingly more complex and technology based than they used to be, and employers demand graduates ‘to be a good fit with their business in terms of skills, abilities and attitudes’ (Pollard et al., 2015, p. 13), but universities seem not adequately respond (House of Lords, 2015).

In today’s digital economy, IT is no longer just an add-on hardware/software to be used in running a business; rather, it is becoming a way of life for all types of business entities (Vasarhelyi et al., 2010b) regardless of their size. Businesses are becoming heavily reliant on various technologies such as accounting packages, tax preparation software, computer-assisted audit techniques, integrated information systems, financial databases, extensible business reporting languages (XBRL), cloud accounting, continuous auditing and continuous monitoring in securely capturing, storing, analysing, preparing and disseminating financial information (ACCA, 2013, 2016). Lately, technologies such as big data analytics, artificial intelligence (AI) and Blockchain are seen as extremely changing the conventional face of the accounting profession (Schwab, 2017).

In this new marketplace, traditional accountants are a dying breed. Susskind and Susskind (2015) predict that future technologies will not keep optimising the traditional ways of work; rather, they will be perfectly capable of performing many tasks completely unsupervised. For instance, Kensho (<https://www.kensho.com>) is featured as the world’s first computational knowledge system to analyse portfolio performance and predict market changes. Many accounting firms plan or actually use AI systems to review a high volume of contracts, prepare tax files, gather evidence, review accounting standards, identify fraudulent invoices for clients, create narrative reports of individual tax returns, etc. (O’Neill, 2016; Zhou, 2017). Given that, Susskind and Susskind (2015) state that the most radical change will lie in the *humans who design and operate these systems*, emphasising that they will look very different from traditional professionals.

In response to such remarkable change in the business environment, the House of Lords (2015, p. 12) highlights the important role of universities in leading this change by stating that: ‘... universities should ensure that all graduates are digitally competent’. However, university educators are not entirely free to structure the subjects they teach. For example, the incorporation of technological developments into accounting curricula may face a number of powerful impediments such as the professional accreditation requirements, where accounting degree programmes may be structured to comply with examination exemptions of as many professional accounting bodies as possible. Kotb et al. (2013) reported the disappearance of an e-business module from the core of an accounting degree programme due to changes in accreditation requirements. Other possible inhibitors may include, for example, lack of IT qualified faculty members (Johnson et al., 2014) and the great appreciation of research at the expense of teaching, as lecturers may agree that the incorporation of IT into accounting curricula is vital but may not do so because they do not see any reward in return (Fazackerley, 2013).

Based on the above, it is important to understand the status quo of technological developments coverage within accounting curricula and the relative importance of the factors inhibiting or motivating accounting educators to incorporate technological developments into accounting curricula. Given the scarcity of empirical evidence in this research area, informed by the views of accounting educators and professional accounting bodies in the UK and Ireland, this study addresses the following two main questions:

*RQ<sub>1</sub>*: To what extent are technological developments currently integrated into accounting curricula?

*RQ<sub>2</sub>*: What are the factors affecting accounting educators' decisions to integrate, or not to integrate, technological developments into their teaching?

### **3. Theoretical Underpinning: Ideological Hegemony**

Historically, traditional theories of power focused on the role of coercion in protecting the interests of specific group(s); mainly the ruling one(s). However, Gramsci (1971) introduced the concept of hegemony under which the ruling class maintain its status not through the use of force and coercion (domination), but rather through the acceptance of the less powerful class of the 'prevailing conditions and constraints as natural or as common sense' (Ferguson et al. 2005, p. 26). The ruling class could achieve this by using the building blocks of civil societies, including educational institutions (schools and universities), religious institutions (churches, mosques, etc), and the media (Eagleton, 2014; Strinati, 2004). Through which the ruling class protects their legitimacy and secures their position by passing their own values and beliefs (i.e. ideology)<sup>3</sup> (Giddens, 1993) to other groups and future generation (Apple, 2012).

The role of ideological hegemony in shaping accounting practice and education has been examined in a number of studies (e.g. Ferguson et al., 2005, 2006; McPhail, 1996, 1999, 2001; Warsame, 2006; Xu et al. 2014). McPhail (1996) asserts that accounting education could be viewed as a form of hegemony as students are inculcated with the values and beliefs integral to capitalism. Ferguson et al. (2005, p. 23) revealed a form of hegemony in the form of the over-emphasis on the interests of shareholders as the prime group at the expense of other stakeholders as accounting education is "heavily influenced by neo-classical economic theory". Ferguson et al. (2006, p. 243) examined the production process of accounting textbooks and concluded that "the knowledge that is considered most 'legitimate' tends to be mandated, either directly or indirectly, by professional accounting bodies through course accreditation requirements."

With this in mind, it is hypothesized that professional accounting bodies play a hegemonic role in shaping accounting education in the UK and Ireland. This is usually achieved through a strict mechanism, exemptions granted to university accounting programmes from examination requirements. In their endeavor to secure the maximum of exemptions, accounting educators are motivated to follow the professional bodies' curricula which is, in turn, set in light of the knowledge, expertise, and beliefs of a given set of individuals at the professional bodies. In other words, members of the accounting profession attempt to keep their social status and economic rewards by controlling accounting education (Richardson, 1988). Accordingly, as leaders of the profession, accountancy professional bodies have a major stake and are expected to play a major role in shaping accounting education and its status quo.

A number of studies have examined the link between accounting practice and education and concluded that university accounting education fails to equip the students with the requisite knowledge and skills required to prepare them for their future careers (for example, Albrecht & Sack, 2000; Humphrey, 2005; Humphrey et al.,

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<sup>3</sup> The concept of ideology can be seen from different perspectives; ideology in the sense of service of power (Thompson, 1990), or as the generic categorisations such as fascism and communism that identify the types of beliefs (Eagleton, 2014). The former is utilised in our study to highlight how specific group(s) attempt to protect their controlling position through hegemony.

1996; Kotb & Roberts, 2011; Kotb et al., 2013; Spraakman, 2011). Much of the blame for this failure has been directed towards professional bodies (e.g., Humphrey et al., 1996; Puxty et al. 1994; Wells, 1987; Zeff, 1989).

Accordingly, this study addresses the hegemonic role of professional bodies as a major inhibitor for technology coverage in accounting curricula by exploring the views of accounting educators on the level of coverage of technological developments in UK and ROI accounting programmes universities. This is followed by a series of interviews with the major professional bodies in the UK and ROI to understand their role in the current level of technological developments coverage as revealed earlier in the paper.

#### 4. Research Method

As part of a broader study, using a mixed-method approach, data were gathered through online questionnaires of accounting educators and a series of semi-structured interviews with accounting educators and professional accounting bodies. Within both methods, a number of questions were asked to explore two main areas: the *status quo* of IT within accounting curricula and the *motivations* and *impediments* for integrating IT developments within accounting curricula.<sup>4</sup>

##### 4.1. Online Questionnaire

The online questionnaire consisted of three sets of questions, including demographic data. In the first group of questions, the respondents were asked to name the modules they taught, indicate (on a five-point Likert scale)<sup>5</sup> the extent to which they agreed/disagreed that IT developments should be integrated into accounting curricula and state whether or not they taught IT topics in their own teaching. If yes, they were further asked to indicate the name of the module, the teaching year, whether it was a core or optional, the IT topics covered, the approximate proportion of the module devoted to these IT topics and the delivery method of these IT topics. They were then asked to name any other resources that might be used to complement IT teaching within the modules they taught. The second group of questions was designed to elicit information on the factors influencing the integration of IT into accounting curricula. The respondents were provided with seven statements as possible motivations, and eight statements as possible impediments, and were asked to indicate the extent to which they agreed/disagreed with each statement. The respondents were also provided with an 'others' option to list any other possible motivations/impediments. The questionnaire was concluded by a set of background questions on demographic variables.<sup>6</sup>

After piloting,<sup>7</sup> an invitation to participate in an online questionnaire was sent by email to 1,161 accounting educators at 112 UK and ROI universities, of which 78 questionnaires were returned unanswered for different reasons (e.g. failed email, not teaching accounting undergraduates, a policy of not sharing information or left

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<sup>4</sup> To ensure that the respondents knew what was meant by the term 'IT' in this study, the IFAC's (2003, p. 7) definition and examples (e.g. spreadsheets, data mining, cloud accounting, computer-assisted audit techniques, etc.) were clearly supplied at the beginning of the questionnaire.

<sup>5</sup> On a scale of 1 = strongly agree (or very important), 2 = agree (or important), 3 = neutral, 4 = disagree (or unimportant) and 5 = strongly disagree (or very unimportant). Some questions offered a 'not familiar with' option. Some of the analysis used a collapsed version of this scale: agree/important (1 and 2), neutral (3) and disagree/unimportant (4 and 5).

<sup>6</sup> Only questions related to the research reported in this paper are reproduced here. The questionnaire is available from the authors.

<sup>7</sup> The questionnaire was piloted on ten academics with relevant teaching and research interests. They were asked to complete the questionnaire and comment on its ease, length, layout, clarity, content and the appropriateness of the questions to the research objectives.

**Table 1:** Online questionnaire respondents

	<i>N</i>	Percentage
<b>Gender</b>		
Female	92	43.4%
Male	120	56.6%
<b>Age</b>		
Under 35	25	11.8%
36 - 45	60	28.3%
46 - 55	69	32.5%
Over 55	58	27.4%
<b>Teaching experience at University level</b>		
Under 1 Year	0	0
1 - 5 Years	28	13.2%
6 - 10 Years	58	27.4%
11 - 15 Years	34	16%
16 - 20 Years	23	10.8%
Over 20 Years	69	32.5%
<b>Type of your current University</b>		
Pre-1992	102	48.1%
Post-1992	110	51.9%
<b>University location</b>		
England	174	82.1%
Wales	6	2.8%
Scotland	14	6.6%
Northern Ireland	9	4.2%
Republic of Ireland	9	4.2%
<b>Current position</b>		
Teaching Fellow / Senior Teaching Fellow / Principal Teaching Fellow	17	8%
Lecturer	59	27.8%
Senior Lecturer	78	36.8%
Principal Lecturer	24	11.3%
Reader	4	1.9%
Professor	27	12.7%
<b>Degrees</b>		
Accounting First Degree	100	47.2%
Non-Accounting First Degree	92	43.4%
Taught Master / MBA	108	50.9%
Master by Research	33	15.6%
Doctoral Degree (PhD)	107	50.5%
None	4	1.9%
Others	20	9.4%
<b>Membership of professional accounting bodies</b>		
ICAEW	54	25.5%
ICAS	5	2.4%
CAI	7	3.3%
ACCA	39	18.4%
CIPFA	10	4.7%
CIMA	26	12.3%
IIA	1	0.5%
Others	24	11.3%
<b>level of IT expertise</b>		
Highly Experienced	22	10.4%
Fairly Experienced	141	66.5%
Novice	47	22.2%
No Experience	2	0.9%

academia), dropping the sample size to 1,083. Thereafter, 212 usable completed questionnaires were received and used in the analysis, from 83 university business schools, giving a response rate of 19.6% (or 74.1% as the university response rate, 83/112), which is within the acceptable range for questionnaire-based accounting studies

(e.g. Helliard et al., 2009; Dunne et al., 2009; Kotb et al., 2013). Non-response bias was tested using late responses as a proxy for non-respondents and the Chi-square test failed to identify any significant differences in the responses between the two groups.

As Table 1 demonstrates, the sample was representative at various levels, such as gender (56.6% male vs. 43.4% female) and type of university (48.1% pre-1992 vs. 51.9% post-1992). The typical respondent was an experienced academic staff member (88.2% over 35 years old, and 59.4%, 11 or more years of experience) at lecturer / senior lecturer / reader / principal / professor level (90.5%) with fairly high / high IT expertise (76.9%) and at least one professional qualification (70.3%), mainly teaching financial accounting, management accounting and/or auditing.

#### 4.2. Semi-Structured Interview

Further to the online questionnaires, a series of semi-structured interviews were conducted with accounting educators. Within the questionnaire, the respondents were asked whether they would be willing to participate in an interview to further explore the findings of the online questionnaire. Fifty-one participants positively responded, showing their willingness to be interviewed. Of these, using purposeful sampling, 17 were selected and interviewed (see Table 2). The selection of interviewees was based on their teaching subject area, gender, type of university, grade of employment and interest in accounting education research, thus providing more-balanced views on the themes being investigated.

**Table 2:** Interviewees' profile

Code	Academic Grade	Gender	Module	University Status
A	Principal Lecturer	F	Financial Accounting	Post-92
B	Teacher Fellow	F	Financial Accounting	Pre-92
C	Senior Lecturer	M	Information Systems	Pre-92
D	Professor	F	Auditing	Pre-92
E	Lecturer	M	Information Systems	Pre-92
F	Lecturer	M	Financial Accounting	Pre-92
G	Senior Lecturer	M	Auditing	Post-92
H	Professor	F	Management Accounting	Post-92
I	Senior Lecturer	F	Financial Accounting	Post-92
J	Principal Lecturer	M	Financial & Management Accounting	Post-92
K	Senior Lecturer	M	Auditing	Post-92
L	Reader	F	Financial Accounting	Post-92
M	Professor	M	Management Accounting	Post-92
N	Professor	M	Financial Accounting	Post-92
O	Professor	M	Management Accounting	Pre-92
P	Principal Lecturer	M	Auditing	Post-92
Q	Teaching Fellow	M	Auditing	Pre-92

The interview guide included questions on: the importance of integrating IT into accounting curricula, motivations and impediments, the level of IT in accounting curricula at their respective universities, and future plans and directions for integrating IT in accounting curricula. All interviews were conducted by one of the

authors. Each interview lasted about 45 minutes. All interviews were recorded and then transcribed by a professional third party to avoid/minimise the possibility of interviewer bias. Notes were also taken during and after the interviews in order to ensure accuracy and completeness.<sup>8</sup>

Given their powerful role in shaping the accounting education through accreditation requirements, semi-structured interviews were also conducted with professional accounting bodies. Course Directors at the six major professional accounting bodies in the UK and Ireland (ACCA, CIMA, ICAEW, CIPFA, ICAS and CAI) were contacted and only five (ACCA, CIMA, ICAEW, CIPFA and ICAS) were willing to be interviewed. All questions were open-ended questions, thus allowing the participants to be freely probed on detailed aspects of the issues being explored. The interview guide included questions on: what constitutes technology, the impact of IT on the future of the accounting profession and the accounting education, the inclusion of IT in the curricula, and when and where professional training should take place. Interviews were face-to-face and lasted between 45 minutes and an hour each. Also, they were recorded and professionally transcribed by a third-party as well as notes were taken during and after each interview, thus ensuring accuracy and completeness.

## 5. Findings

### 5.1. The Status Quo of IT in Accounting Curricula

Overall responses from accounting educators revealed that undergraduate accounting students are hardly taught about technologies employed in the business environment in which they will operate. This was echoed by interviewee N: *'We're more backward, we're more traditional: we're not forward-looking'*. While the large majority of respondents (180, 84.9%) indicated their strong agreement with the statement that IT developments should be integrated into undergraduate accounting curricula, this was particularly surprising when contrasted with only 67 (31.6%) of respondents indicating that they did cover some IT-related topics in one or more of their modules. This contradiction was expressed by interviewee P:

I actually do feel very strongly, though, that we ought to be integrating more clearly the teaching of auditing and the teaching of IT. The people who are teaching IT, they know nothing about auditing. So, I think integration is going to be very, very important, and I suspect at the moment that's not taking place.

To examine whether respondents' IT experience and/or teaching experience are associated with their views on the importance of integrating the IT developments into the UG accounting curricula, Spearman rank correlations revealed significant correlations (both p-values are less than 0.05), however weak because they are close to Zero (0.170 and 0.145 respectively). Therefore, we cannot conclude that the participants' views about the importance of IT coverage in the accounting teaching are influenced by their IT experience or teaching experience.

To gain further insight into the extent to which IT developments were taught within accounting curricula, further analysis revealed that, as demonstrated in Table 3, 67 (31.6%) of the respondents included at least some IT-related topics across a total of 120 modules, including financial accounting (36), management accounting (33), auditing (14), information systems (12) and other accounting modules (25), such as taxation, forensic accounting

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<sup>8</sup> Since the interviews were part of a broader study, only quotations relevant to the present paper are used to support the findings of the online questionnaire.

and contemporary issues in accounting. A significant number (97, 90.8%) of these modules were core, whilst auditing modules represented a significant minority (6, 2.8%) but were also core. The majority of the financial accounting, management accounting and information systems modules were located in years one and two, with 9% or less in years three or four. IT developments were covered in a comparatively small proportion of the 120 modules, with the majority of responses (85/120 modules, 70.8%) representing that less than 25% of teaching time was devoted to IT-related topics. These IT-related topics included XBRL, cloud accounting, enterprise resource planning (ERP), cybercrime and computer-assisted audit techniques. In teaching such IT-related topics, the respondents indicated that they mainly used textbooks. A fair distribution was found across the subject disciplines with regard to the mode of delivery of IT-related topics, with a combination of normal class-based teaching and computer lab workshops. However, the majority of the respondents who taught auditing indicated no use of computer labs. No association was found between the IT coverage and the teaching year for all accounting modules.

**Table 3:** The extent to which IT developments are covered within undergraduate accounting modules

	Teaching Level				Status		% of Coverage			
	1 <sup>st</sup> Year (%)	2 <sup>nd</sup> Year (%)	3 <sup>rd</sup> Year (%)	4 <sup>th</sup> Year (%)	Core (%)	Option (%)	<25% (%)	25– 50% (%)	51– 75% (%)	75–100% (%)
Financial Accounting (36)	28 (13.2)	3 (1.4)	3 (1.4)	2 (0.9)	34 (16)	2 (0.9)	27 (12.7)	8 (3.8)	0 (0)	1 (0.5)
Management Accounting (33)	12 (5.7)	10 (4.7)	7 (3.3)	4 (1.9)	30 (14.2)	3 (1.4)	25 (11.8)	7 (3.3)	1 (0.5)	0 (0)
Auditing (14)	0 (0)	4 (1.9)	8 (3.8)	2 (0.9)	6 (2.8)	8 (3.8)	14 (6.6)	0 (0)	0 (0)	0 (0)
Information Systems (12)	3 (1.4)	8 (3.7)	0 (0)	1 (0.5)	11 (5.2)	1 (0.5)	1 (0.5)	2 (0.9)	1 (0.5)	8 (3.8)
Other Modules (25)	5 (2.4)	12 (5.7)	5 (2.4)	3 (1.4)	16 (7.6)	9 (4.2)	18 (8.5)	5 (2.4)	1 (0.5)	1 (0.5)

## 5.2. IT in Accounting Curricula: Motivations

To investigate the possible motivation(s) to integrate technology developments into undergraduate accounting teaching, the respondents were provided with seven possible motivations to include IT developments in the accounting curricula and asked to indicate the extent to which they agree or disagree with each motivation. Table 4 summarises the responses for the complete sample, with statements (possible motivations) ranked based on mean score, with 1 (agree) being the highest value and 5 (disagree) being the lowest value. Composite mean scores ranged from 1.722 to 2.657, indicating that the responses were mainly inclined towards agreement.

The most important motivation was thought to be the need to reflect the current business environment; making accounting graduates highly valued in the job market. This was reflected in the first four statements being

identified as the four key motivations or drivers for integrating IT developments into accounting curricula, with mean scores less than 2.00 on the five-point Likert scale (1 being the highest value and 5 being the lowest value).<sup>9</sup>

**Table 4:** Motivations for integrating IT developments into accounting curricula

	<i>n</i>	% of Respondents			Mean	Std.
		Agree	Neutral	Disagree		
To make accounting graduates more desirable in the marketplace	209	87.6%	10.5%	2.0%	1.722	.7655
Increased adoption of IT applications by organisations	210	88.6%	9.5%	1.9%	1.757	.7208
To meet the accounting profession's needs	210	84.8%	12.4%	2.9%	1.857	.7568
To keep accounting degrees abreast of IT developments	209	82.8%	12.0%	5.2%	1.942	.8358
To fill a skill gap in the current accounting curriculum	211	75.3%	17.5%	7.1%	2.052	.8519
To keep accounting degrees academically competitive	211	67.8%	22.3%	9.9%	2.213	.9345
To meet the exemption requirements of accounting professional bodies	210	46.6%	36.2%	17.2%	2.657	.9765

Scale (collapsed): agree (1: strongly agree and 2: agree), neutral (3) and disagree (4: disagree and 5: strongly disagree).

The interviewees also echoed the need to reflect the technological changes in the business environment, thus making graduates more employable, as the key motivation or driver for integrating IT developments into accounting curricula. For example, their responses included the following:

... this is very important now because all companies ... incorporate the accounting system within their ERP software. That's where accountants are left out. They struggle to understand the system; sometimes they oppose it; sometimes they try to find faults in the system in order to show you it's not meant for the accountant. I'm saying it's not the system – it is the user. Then I'm not saying only the user – it's the background where the user comes from. It starts with the university ... So, the responsibility stays with the university, with the academics ... (Interviewee F)

Furthermore, bridging the gap in the current accounting curricula was ranked next in importance, with statements: 'to fill a skill gap in the current accounting curriculum' and 'to keep accounting degrees academically competitive' scoring mean scores of 2.052 and 2.213 (respectively) and recognised by more than two-thirds of the respondents. This reflects the ongoing calls to close the widening gap between academia and practice (see, for example, Ahmed, 2003; Elliott, 1992; Kavanagh & Drennan, 2008; Sangster, 1995). This concern was stressed by the interviewees, for example:

... I think that one of the big challenges to us within academia is to prepare them for the real world, and I think that a lot of what we do, whether it be to give them time management skills, the ability to work in a group, the ability to recognise when they can't do something, along with their IT skills, are the key skills. (Interviewee I)

In consistency with our theoretical framework on the hegemonic inhibiting role of the professional accounting bodies, 'to meet the exemption requirements of accounting professional bodies' was ranked the least

<sup>9</sup> A cross-tabulation between the views on the motivations to integrate IT into the UG accounting curricula and demographic variables (i.e. gender, age, university type, having a PhD, IT experience, and teaching experience) yielded insignificant Chi-square values in most cases, except for the university type which tends to be associated with the participants' views (see Appendix A). The cross-tabulation analysis revealed that academics from post-1992 universities have stronger agreement with the motivations than those from pre-1992 universities.

important factor in motivating accounting educators to integrate IT developments into accounting curricula. For example, one respondent commented: *'There are no exemptions that need IT, which is why it is often not done'*. This reflects the negative impact of the profession on accounting education in the UK through the accreditation and exemption requirements, which place greater emphasis on numerology than on the broader issues affecting accounting practice and the profession, such as IT developments (Lee, 1989). In this sense, accreditation and exemption requirements may act more as “ideological” inhibitors than as motivators for integrating IT developments into accounting curricula. Interviewee N, who is also the author of a best-selling financial accounting textbook, highlighted the negative impact of exemption requirements and recommended that *'what we should be doing is forgetting about accreditation'*.

Accreditation has always been criticised by accounting educators because of its constraining nature, influencing both curriculum content and patterns of assessment, which prevents developing more generic broader knowledge and skills that meet employers' needs (Apostolou & Gammie, 2014). For example, Duff and Marriott (2012, p. 43) state that the majority of accounting academics *'saw accreditation as a restrictive force and was something that discouraged lecturing staff from developing their own curriculum based on their interests, motivations and skills'*.

In the UK, most of those who take the professional examinations of the ICAS and ICAEW are not majored in accounting (Evans, 2014). Arguably, becoming a qualified accountant through professional examinations, even when not having an accounting degree, could be better for employers as professional accounting bodies are in a better position to prepare graduates for the profession (e.g. Anisette & Kirkham, 2007). This reasoning puts pressure on universities to accept values and beliefs of professional accounting bodies regarding what accounting curricula should (and should not) include, meeting the needs of students, who are of greater demand for exemptions, and therefore attracting more students (Duff and Marriott, 2012).

### 5.3. IT in Accounting Curricula: Impediments

To explore the possible impediment(s) to cover technology developments within undergraduate accounting curricula, the respondents were provided with eight possible impediments and asked to indicate the extent to which they agree or disagree with each of them. Table 5 summarises the responses for the whole sample, with mean scores ranging from 2.237 to 3.817, suggesting diversity among the respondents' views.

Although respondents prioritised the lack of resources (i.e. staff, space/time, lab, budgets, materials, etc.) over the interest of professional accounting bodies, we strongly argue that professional accounting bodies play a powerful (i.e. hegemonic/inhibiting) role in shaping the undergraduate accounting syllabi in the UK and ROI undergraduate accounting degrees through accreditation and exemption requirements. In support of this, the interviews with the major professional accountancy bodies revealed, interestingly, a number of common themes/beliefs with regard to what constitutes technology, the inclusion of IT in the curricula, when and where training should take place, and, more importantly, the impact of technology on the future of the audit profession. For example, some of these beliefs were expressed strongly such as *'There's nothing IT is going to do to change that [accounting]'* and *'Yes, same skills, I don't see any change in those at all'*, when referring to the skills required to practice the accounting in the so-called *digital economy*.

**Table 5:** Impediments for integrating IT developments into accounting curricula

	<i>n</i>	% of Respondents			Mean	Std.
		Agree	Neutral	Disagree		
Lack of academic staff competent to teach IT	211	68.7%	19.0%	12.3%	2.237	1.000
Lack of academic staff interested in teaching IT	211	64.9%	22.3%	12.8%	2.308	0.992
No room in an already overloaded curriculum	210	61.5%	19.0%	19.5%	2.414	1.095
Lack of resources (e.g. labs, budgets, etc.)	210	54.8%	20.0%	25.3%	2.523	1.137
Lack of teaching materials (e.g. textbooks)	210	41.9%	34.8%	23.3%	2.747	0.937
Lack of interest from accounting professional bodies	207	14.5%	48.3%	37.2%	3.275	0.873
Lack of student interest	210	22.8%	28.1%	49.0%	3.319	0.996
It is not necessary for accounting education	208	13.0%	15.9%	71.22%	3.817	1.014

Scale (collapsed): agree (1: strongly agree and 2: agree), neutral (3) and disagree (4: disagree and 5: strongly disagree).

Further, most of the quotations provided below underestimate the impact of IT on the accounting profession, resulting in lack of IT coverage in professional accounting syllabi and exempted/accredited undergraduate accounting programmes. For example, there seems to be a general assumption that students learn about IT in schools and there is no much need (compared to the past three decades) to educate them about it.

They're coming from whatever background and there's no longer any need to educate them on the use of a computer, they know more than somebody 30 years older than them on the use of computers. .... There isn't the same need to actually educate them on anything to do with computers per se. (professional body 1)

We incorporate less IT now than we used to do ..... They are so IT-literate that in terms of personal IT and all of those things that used to be within a curriculum... they are more or less taken for granted. They have acquired these skills by the time they have left school and some of them acquire them at a very early age at school. (professional body 2)

A lot of students pick up IT skills naturally in other ways – through school, through personal use – most people have personal computers, iPads, etc., etc., so a lot of people come and start [qualification name] with more IT knowledge and experience than any of the tutors that are going to be teaching them accountancy. (professional body 5)

There was also an assumption that students will be trained 'on the job' about technological developments as there is no need to train the students on specific packages which could form a sort of endorsement for specific brands.

The training would come through the firm. ... when a firm is in the consultancy end and helping implement SAP systems or Oracle or whatever, then they would receive the training for that through specialists in the firms. (professional body 1)

I think that's something which, you know, it's expected that you can pick up on the job. (professional body 3)

When asked about the potential impact of technology on the future of the accounting profession, the responses reflected strong beliefs that accounting/auditing will not change, and that technology will not change the way professional accountants do their jobs. This has been clear in 4 of the 5 interviews.

what we're teaching won't change hugely. The auditing standards have not changed greatly as a result of technology in many years and nor do they have to. ... It doesn't really matter if it's a paper filing cabinet or an electronic one, the underlying principles are the same. (professional body 1)

An accountant has to know how to access that information but would not need to necessarily be directly involved in understanding how that system works in the background. (professional body 2)

So at the moment I don't feel there's any indication that we need to do any more practical IT stuff in-house. (professional body 5)

Finally, the perception that universities will follow what professional bodies dictate was made very clear when professional body 5 stated:

And the university go well in that case we'll put internal audit onto the syllabus and they actually change their qualification to suit.

Overall, what can be concluded from interviews with professional bodies is that the major professional accounting bodies have strong beliefs with regard to their understanding of technology and its potential impact on the profession. There are clear signals that tend to underestimate the potential impact of technological developments such as artificial intelligence and big data. There is a common belief that (accounting) students get enough IT training during their school education; a belief that reflect a misunderstanding of the role of technology by limiting it in the general use of computers including productivity software such as spreadsheets and word processing, in addition to the Internet. The lack of IT coverage in their curricula is justified by another belief that students will be trained 'on the job'. Finally, there is strong evidence that technological development will not have an impact on the profession; IT is a tool and it will continue to be used as a tool. Arguably, these views reflect the ideology (a set of beliefs of a strong group) of professional accounting bodies that are dictated to other groups in society (universities) using its (soft) powers of granting exemptions from examination requirements.

Although the lack of academic staff competent and interested in teaching IT represent the top two obstacles facing the integration of IT developments in the UG accounting curriculum, the hegemonic inhibiting role of professional accounting bodies could significantly contribute to the lack of universities' and accounting educators' motivations to integrate IT knowledge and skills into undergraduate accounting degree programmes. In the UK and ROI, accounting education is under the control of the professional accounting bodies (Becher, 1994) and university accounting educators have less influence, compared to other countries, on the content/assessment of the courses that they teach (Ellington, 2017). To put it in another way, if accounting professional accounting bodies had required incorporating IT in accounting curricula, universities would have introduced training to develop their staff's IT skills and staff would have been motivated to teach IT. The interviewees indicated the lack for IT training provided by universities. For example:

No, I never been on an IT related... even when I started, I don't think I was given training, I had to use Oasis, I don't think I've ever done anything. (Interviewee A)

Not really, I haven't got the time or the head space for them. The problem is with the ones that are available is they're disconnected from when you're actually using it. So, by the time you

come to use it you're trying to get, you're trying to remember what you did and get the notes out. (Interviewee B)

Accordingly, it cannot be concluded that the lack of staff competent and interested in teaching IT are in themselves obstacles to IT integration in accounting curricula as long as universities and staff are *ideologically* influenced by professional accounting bodies. In fact, the lack of staff's competence and interest in teaching IT to undergraduate accounting students is a result of the *ideological dominance* of professional accounting bodies in the UK and ROI, not a direct factor preventing the IT incorporation in the undergraduate accounting degree programmes.

## **6. Conclusion, Recommendations, Limitations and Future Research**

The primary purpose of this study is to investigate the status quo of technological developments coverage in accounting curricula and establish the factors influencing this status quo. The overall findings suggest a fairly widespread view among accounting educators that technological developments represent an important and relevant area that needs to be adequately incorporated in accounting curricula in order to reflect changes in the marketplace. However, this area is still a peripheral component in an accounting degree. The evidence gathered lends support to the argument that professional accounting bodies play a powerful hegemonic inhibiting role in the current lack of proper coverage of IT-related topics in accounting curricula in the British and Irish universities.

Given the unique nature of the digital economy, it is important that accounting graduates are made aware of how technology is changing the field in which they are expected to work. Not addressing such changes in the accounting curriculum reduces the employability and work-readiness of accounting graduates. For example, Kotb et al. (2012) warned that 'the traditional authority enjoyed by external financial auditors is being, and will be, challenged by IT audit specialists', as IT has not been a significant part of their training/education. However, given findings of interviews with professional accounting bodies, major part of the responsibility for this failure can be laid at the door of the professional accounting bodies, as a result of their (unique) hegemonic role in shaping the accounting education in the UK and ROI through accreditation requirements, compared to other countries (Ellington, 2017).

The way ahead can perhaps follow one or more of the following tracks. First, in order to achieve a better link between accounting education and practice, accounting educators are recommended to get involved with professional bodies (Langenderfer, 1987) and practitioners to participate in the educational activities of the profession (Wells, 1987). Regular consultations with research informed educators on the content of professional bodies curricula are recommended for this alternative to work. Perhaps these academics should be recruited as members of the panels responsible for the periodic revisions of the professional curricula. Second, professional bodies should make it clear that universities do not have to have 100% adherence level of their curricula as a requirement for exemptions; accordingly, encouraging universities and academics to include emerging issues (technology) in their programmes. Third, the professional bodies' teams responsible for assessing university programmes and granting exemptions should be trained not only to focus on matching applications against the professional bodies' curricula, but also to look at the other issues/topics that are not part of their curricula. These perhaps should be highlighted in the universities' applications for exemptions in a separate section. The final alternative, according to Lee (1989), entails the separation between educators and practitioners. An alternative

under which universities would be responsible for education and professional bodies responsible for training (Chambers, 1972). However, this does not seem to be practical as universities are seeking the maximum number of exemptions from the examination requirements of the professional bodies.

As with all research, this study had a number of limitations, each of which can be regarded as a possible avenue for further research. First, the geographical focus of the study was limited to the UK and ROI, but the findings of the study are likely to be internationally relevant, given the rapidly growing importance, and wide adoption, of digital technologies in the business environment in which accounting students worldwide are likely to be exposed to after graduation, if not before. Also, professional bodies qualifications such as ACCA and ICAEW are widely accepted specially in Asia and the Middle East and it is expected that universities in the area would try to secure the maximum number of exemptions and be subject to the same pressures. Second, the study was limited to the views of academics and professional bodies, suggesting an opportunity for future research to survey the views of employers and recent graduates/recruits to broaden our understanding of other external demands and pressures on the accounting curriculum. Third, the present study addressed what and why questions regarding the coverage of IT within undergraduate accounting curricula; therefore, this suggests the need for future research on what/how IT-related topics could be integrated across the undergraduate accounting curricula. Finally, although several suggestions have been proposed since 1970s, little has changed. This suggests the need for future research on why such ancient suggestions have not been implemented.

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Appendix A

	Gender	Age	University type	PhD	IT experience	Teaching experience
	Value (p-value)	Value (p-value)	Value (p-value)	Value (p-value)	Value (p-value)	Value (p-value)
To make accounting graduates more desirable in the marketplace	1.577 (0.893)	11.258 (0.412)	22.645* (0.000)	4.193 (0.350)	13.430 (0.501)	19.481 (0.111)
Increased adoption of IT applications by organisations	3.338 (0.506)	9.506 (0.672)	13.723* (0.004)	3.240 (0.544)	12.154 (0.714)	16.110 (0.379)
To meet the accounting profession's needs	2.107 (0.790)	12.235 (0.378)	15.319* (0.002)	7.260 (0.089)	13.174 (0.546)	14.749 (0.523)
To keep accounting degrees abreast of IT developments	1.098 (0.928)	17.389 (0.077)	12.681* (0.008)	8.257 (0.066)	12.494 (0.442)	17.021 (0.280)
To fill a skill gap in the current accounting curriculum	3.998 (0.254)	10.187 (0.318)	7.352 (0.058)	2.081 (0.569)	13.527 (0.087)	12.556 (0.378)
To keep accounting degrees academically competitive	5.343 (0.242)	14.014 (0.243)	9.756* (0.038)	3.029 (0.578)	20.974* (0.028)	18.697 (0.213)
To meet the exemption requirements of accounting professional bodies	3.498 (0.485)	14.154 (0.264)	2.431 (0.673)	4.371 (0.368)	11.935 (0.419)	24.594* (0.047)

\*Significant at  $p < 0.05$