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Voluntary reporting of intellectual capital

Comparing the quality of disclosures from New Zealand, Australian and United Kingdom universities

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Abstract

Purpose – The purpose of this paper is to examine the quality of voluntary intellectual capital (IC) by universities in New Zealand, Australia, and the UK.

Design/methodology/approach – An IC framework was developed to measure IC reporting in the university sector. Content analysis was used to analyse the 2011 annual reports before a three-year comparative analysis of 90 universities (eight New Zealand universities, 38 Australian universities, and 44 UK universities) was undertaken.

Findings – New Zealand and Australian universities outperformed the UK universities in terms of IC disclosures. Additionally, the study found moderate increases in the levels of IC disclosures over the period of the study. The quality of IC disclosures by New Zealand universities was generally higher than their Australian and UK counterparts. Internal capital and human capital were the most disclosed categories with external capital being the least frequently disclosed in all three countries. However, the quality of external capital disclosures was higher than internal and human capital. Finally, most IC disclosures were narrative in nature.

Practical implications – The framework developed in this study could be adapted, further enhanced, and then applied to exploring IC disclosures in higher educational institutes in other jurisdictions.

Originality/value – This is the first comparative analysis of IC disclosures made by universities in three countries.

Keywords Universities, Intellectual capital, Quality disclosure

Paper type Research paper

1. Introduction

Intellectual capital (IC) is recognised as the pivotal driver behind value creation in many private and public sector organisations (Whiting and Miller, 2008). Alcaniz *et al.* (2011) explain that "strategy permeates the entire organisation, identifying the path that all departments and functions have to pursue in order to accomplish the objective of creating value" (p. 106). Importantly they state that "intellectual capital resources are often performance drivers; hence there is a causal relationship between those resources and value creation" (p. 106). Some studies have suggested that between 50 and 90 per cent of the value created by an organisation may be derived from its IC rather than the production of goods and services (Guthrie *et al.*, 2004b). In spite of its

importance, it is unusual for IC items to appear on organisational balance sheets. The reason is that these intangible assets are not normally captured by traditional accounting practices (Sonnier *et al.*, 2007; Yi and Davey, 2010; Alcaniz *et al.*, 2011; Rashid *et al.*, 2012). Adding to IC's importance is the fact that it is increasingly being seen as an innovative management technology (Chiucchi and Dumay, 2015) and is topical in the academic literature and practice.

Early IC research focused primarily on establishing definitions and reporting frameworks, that is, IC classifications (Bontis, 2001, 2003; Sveiby, 1997; Petty and Guthrie, 2000). These definitions and frameworks have been examined by IC research studies conducted in a number of countries including Australia, Ireland, Sri Lanka, Italy, the UK, the USA, Canada, New Zealand, Brazil, China, Hong Kong, Sweden, Spain, Portugal, Malaysia, the Netherlands, Singapore, and India. In addition, organisations including the Organisation for Economic Co-operation and Development, the Association of Chartered Certified Accountants, and the Institute for Social and Ethical Accounting have attempted to develop voluntary IC disclosure frameworks (Boesso and Kumar, 2007; Organisation for Economic Cooperation and Development (OECD), 2001; Association of Chartered Certified Accountants (ACCA), 1999; ISEA, 1999). However, in spite of these efforts, consensus on an IC disclosure framework has yet to be achieved. Nevertheless, there have more recently been efforts to develop an intellectual capital maturity model which Secundo *et al.* (2015) indicate is a flexible model for implementing IC approaches with public universities. Consequently, it would be interesting to investigate the uptake of this model by universities in their reporting of IC.

Most prior studies on IC disclosure have focused on knowledge-intensive or services-based industries. However, in spite of its nature as a producer and supplier of knowledge, the university sector appears to have been largely overlooked. Secundo *et al.* (2015) write that "the public sector is one of the least addressed areas of intellectual capital (IC) research" (p. 419) and that "universities are an interesting area of investigation because they are considered critical players in the knowledge-based society" (p. 419). The authors' study explores IC information voluntarily disclosed in annual reports of universities for the purpose of gaining a better understanding of the disclosure practices of this sector. Similar to corporate entities, universities are legally independent, and their governing bodies are responsible for the effective management of the institution and for planning its future development (Higher Education Funding Council for England, 2005).

Further, in recent years universities have been going through extensive changes in the way they are administrated. Although a large percentage of income received by universities was traditionally provided by governments, this has decreased in recent years. Therefore, in order to attract additional funds from external sources, universities are more likely to increase their intangible assets in ways that are likely to generate income to fund operations. Therefore, considering the importance of IC to universities, it is surprising to find that literature examining IC reporting practice by universities is relatively scarce. Alcaniz *et al.* (2011) state that "surveys of practice are valuable and in due course may lead to new policy initiatives" (p. 105). More importantly, they argue that "the absence of much *critical* work on IC accounting remains a worrying lacuna, not least because of its potential to pose challenging questions about the broader ramifications of organisations' increased reliance on such assets" (original italics, Alcaniz *et al.*, 2011, p. 105). This important argument suggests that the lack of research into IC disclosures in the university sector has ramifications for this sector as university management are not being challenged to look at policy initiatives that account for IC assets. Secundo *et al.* (2015) write that "in the wide range of public organisations several studies

have highlighted a lack of research with reference to state universities" (p. 426) and "several calls for research have been published to improve the managing of IC in those organisations" (p. 426). The public sector is one of the least addressed areas of IC research (Guthrie and Dumay, 2015; Veltri and Silvestri, 2015).

In adapting an IC framework developed previously (Schneider and Samkin, 2008), the authors of this study have three research objectives: first, to explore the quality of the IC reporting practices of universities in New Zealand, Australia, and the UK; second, to identify the trends of IC reporting quality by the universities over a three-year period; and third, to compare the results to identify the differences in the quality of disclosures between universities and countries.

A study of IC reporting in universities is important for a number of reasons. First, it contributes to the understanding of the current IC reporting practice of the higher education sector by examining IC reporting in universities. Second, results generated from this study provide insights into the nature of and motivation for voluntary reporting in universities which could be used by various stakeholders of universities including management, regulators, and standard-setting bodies as they may seek to improve the reporting of IC in this sector. Third, the results generated illustrate that disclosures of IC by New Zealand and Australian universities exceed those made by universities in the UK. Results of this study suggest that the IC disclosure levels in annual reports of universities in the three countries have increased moderately over the three-year period. Further, the longitudinal analysis depicts a similar trend in disclosure quality. Universities in New Zealand had a relatively higher IC disclosure quality growth rate than did universities in Australia and UK. Therefore, the results generated from this study could be utilised in future investigations as a basis to facilitate comparative research that identifies possible trends, similarities, and distinctions of IC reporting practice across different universities and countries.

2. Literature review

In today's economic environment, the value of most organisations is created through the judicious management of their IC (Guthrie *et al.*, 2004b; Lee *et al.*, 2007). Although the topic of IC reporting has drawn the attention of academics since the early 1990s, there is still no consensus on the definition of the IC concept for two reasons. First, the definition of IC can differ between industries, or can even differ between departments in an organisation. As a result, it is difficult to provide a common definition. Second, researchers have tended to use their own IC definition rather than rely on a generally accepted definition. Further, there is no legal requirement for organisations to report or measure IC, which means that any disclosure of this information is provided voluntarily (Petty and Cuganesan, 2005).

Results of recent empirical-based IC publications indicated that knowledge-intensive and knowledge-based service industries have more incentives to disclose their IC information (Boesso and Kumar, 2007; Guthrie *et al.*, 2004b; Sonnier, 2008; Whiting and Miller, 2008) because the demand of these organisations' stakeholders for IC information has increased significantly (Taylor, 1998; Bozzolan *et al.*, 2003; Guthrie *et al.*, 2004b; Sanchez and Elena, 2006). However, it is surprising to find that literature examining the higher education sector is relatively scarce, considering the important role that IC plays in a contemporary organisation.

Why this is the case is perplexing since the university sector is not only knowledge-intensive, but is also a knowledge-based service industry (Fazlagic, 2005). Further, in light of the importance of IC, it is surprising that organisations are not required by

accounting standards or legislation to make these disclosures (Petty and Cuganesan, 2005). Regulators have not only failed to provide a suitable base for measuring IC but also failed to make sizeable adjustments to the traditional business reporting model to compensate for the growth and significance of IC reporting (Beattie and Thomson, 2007). The Financial Accounting Standards Board (FASB) has recognised the inadequacy and limitation of the current accounting model for intangible assets and IC (FASB, 2001). In order to remedy this issue, FASB encourages organisations to disclose information of IC voluntarily as doing so provides more transparency and promotes a greater understanding of the economic drivers of an entity among stakeholders (Sonnier *et al.*, 2007).

However, voluntarily reporting IC information could result in the organisations' incurring additional costs. From an economic perspective, voluntary disclosure can be justified only if the advantages gained outweigh the disadvantages (Depoers, 2000). Therefore, organisations are more likely to report voluntarily if they have incentives to do so (Guthrie *et al.*, 2006). A review of the literature suggests three incentives for organisations to report their IC: first, to resolve uncertainty about the organisation and to thereby improve the share price (Edvinsson, 1997; Lev, 2001); second, to "render the invisible visible" (Cooper and Sherer, 1984, p. 12; Stewart, 1997), that is, if it is not reported, there may be a risk that management will not focus sufficient attention on this area (Guthrie and Petty, 2000); and third, organisations that disclose IC could be rewarded by the labour market. Additional information disclosed regarding human capital depicts the significant focus placed by the organisation on human assets and the organisation may, therefore, be more attractive to individuals with higher skills and experience (Bukh *et al.*, 2005; Petty and Cuganesan, 2005).

Previous studies have highlighted the correlations between different industry sectors and the amount of IC information disclosed. This research has emphasised that the industry sector is important for IC reporting practice (Guthrie *et al.*, 2006, 2004b; Sujan and Abeysekera, 2007). For example, studies that have compared the IC reporting practices of high-tech industries and traditional manufacturing industries have found that high-tech industries generally have a higher frequency of IC disclosure than traditional industries (Boesso and Kumar, 2007; Guthrie *et al.*, 2004b; Sonnier, 2008; Whiting and Miller, 2008).

Sujan and Abeysekera (2007) investigated the IC reporting of top Australian firms that included six industry groups: materials and energy, financial services, media and telecom, retail, knowledge-based and service, and others. Their results suggest that the materials and energy industry reported less IC information than other industries. They argue that their findings are not surprising because the market value of such firms in the industry is not dominated by IC but by other factors such as physical asset, new resources discovery, advance mining, manufacturing and world materials, and oil prices (Sujan and Abeysekera, 2007).

In comparison, the knowledge-based and services firms report more IC information. This difference can be explained by their market value being reliant on intangibles such as technology, research and development, and knowledge. Knowledge-based and services firms operate in a competitive environment and have to rely on intangibles to obtain an advantage. Therefore, knowledge-based and service firms have more incentives to disclose IC information to signal their competitiveness (Abeysekera and Guthrie, 2005; Sujan and Abeysekera, 2007). In their study of the South African mining industry April *et al.* (2003) found that firms in this industry reported less IC information than firms in other industries. However, external capital information such as business collaborations and favourable contracts seem to be important IC disclosures which are being reported by mining companies.

As indicated earlier, studies on IC reporting by the higher education sector, particularly universities, is limited. One exception is Fazlagic (2005) who used a metaphorical comparison that resembled the examination of health by physicians employed in a hospital to describe the measurement of IC in a university. The medical profession is often assumed to apply the newest knowledge or technologies relating to well-being. This viewpoint is similar to the assumption that IC disclosure or measurement of the academic community must achieve the highest knowledge levels possible without outside interference (Fazlagic, 2005). More recent studies on IC have been conducted in the following areas: a university hospital setting (Vagnoni and Oppi, 2015); development of an IC model for European universities (Secundo *et al.*, 2015); a literature review on IC and the public sector (Dumay *et al.*, 2015); and new frontiers in the use of IC in the public sector (Guthrie and Dumay, 2015).

Reporting on IC by universities is important for three reasons. First, as public organisations, universities are required to maximise their return on social investment; which means that they should disclose more information to their stakeholders (Fazlagic, 2005). These stakeholders include students, those public authorities providing funding, the labour market, and society as a whole (Sánchez *et al.*, 2006). Second, the university sector is a knowledge-intensive industry. The main goals of universities are the production and diffusion of knowledge, while the most significant investments for universities are in research and human resources (Fazlagic, 2005). Third, universities benefit from measuring and reporting IC information. Management concepts such as strategic planning or quality initially used previously only in a business environment are now being adopted by higher education. It has been argued that, in light of this adoption, management, and disclosure of intangibles are deemed to be necessary in making universities more comparable, flexible, transparent, and competitive (Sánchez and Elena, 2006).

3. Methodology

In the development of any research study, the researchers need to explain their methodological approach and the methods that they used to answer the research objectives posed for the study. Guthrie *et al.* (2004a) explain that "methods are the means whereby one collects and analyses data" (p. 419), whereas "methodology refers to the philosophical issues which underlie those methods" (p. 419). Guthrie *et al.* highlight that these terms, therefore, mean very different things, although journals vary in the extent to which they exercise that difference. For instance Dumay and Cai (2015) and Krippendorf (2013) write about content analysis as a methodology while others (Flick, 2015; Neuendorf, 2002) might view content analysis as a method or technique of data collection and analysis.

This study adopts a qualitative approach and follows an interpretative paradigm. Hennink *et al.* (2011) defines qualitative research as an approach that allows the examination of people's experiences in detail by using a specific set of research methods such as in-depth interviews, focus group discussions, observation, content analysis, visual methods, and life histories or biographies. Further, citing Denzin and Lincoln (2008), they explain that "qualitative research involves an *interpretative* naturalistic approach to the world and that qualitative researchers attempt to make sense of, or *interpret* phenomena in terms of the *meanings* people bring to them" (original italics, Hennink *et al.*, 2011, p. 9).

Morgan and Smirich (1980) write that "qualitative research is an approach rather than a particular set of techniques, and its appropriateness derives from the nature of the

social phenomena to be explored" (p. 491) and hence the ontological assumption is that human beings actively contribute to the creation of the social world. This viewpoint is supported by Hennink *et al.* (2011) who, citing Snape and Spencer (2003, p. 7), emphasised the integral component of qualitative research as being in "the importance of interpretation and observation in understanding the social world".

Thus, the basic assumptions of the interpretative paradigm under the qualitative approach are that "meanings are produced and exchanged in interpretive processes where research has to begin with analysing the concepts produced and used in these processes" (Flick, 2015, p. 24). The authors' comparative and longitudinal study explores a social phenomenon: the quality of voluntary IC disclosure practices of universities in three countries. An interpretive paradigm was used in this study because IC reporting is nebulous. Furthermore, because of its subjective and abstract nature, IC does not lend itself to precise measurement. Neuendorf (2002) writes that interpretative analysis "with its roots in social scientific inquiry, [it] involves theoretical sampling, analytical categories; cumulative, comparative analysis; and the formulation of types or conceptual categories" (p. 6), and that the methodology is wholly qualitative in nature as the analyst is in a constant state of discovery and revision within this cumulative process.

The primary data source for this study was the annual reports of universities in New Zealand, Australia, and the UK. According to Rylander *et al.* (2000), the goal of disclosure is to provide relevant, reliable, and timely information to persons who need to know the information so that they can make decisions concerning their relationship with the organisation. Ideally, external reporting of an organisation should capture all IC information and this can then be monitored and reviewed by the public (Guthrie *et al.*, 2004b). Dumay and Cai (2014) found that 79 per cent of IC disclosure research analysed annual reports as the primary data source. The annual report is a formal communication device that provides a platform for an organisation, connecting with both its internal and external stakeholders (Guthrie and Petty, 2000). Two aspects reflect this connection. First, annual reports are regularly produced and they provide management with opportunities to maintain or improve the performance of the organisation (Beattie and Thomson, 2007; Guthrie and Petty, 2000). Second, annual reports offer stakeholders opportunities to undertake comparative analysis of management attitudes and organisation polices (Guthrie *et al.*, 2004b).

Given that there is no legal requirement to disclose IC information in an annual report; prior studies reveal a lack of consistency in IC reporting by organisations. However, in general, results generated from prior studies suggest that companies realised the importance of IC reporting, a realisation which has resulted in an upward trend in levels of reporting in countries like Australia, China, the Netherlands, the UK, and the USA.

In this study, content analysis was employed to analyse annual reports as it can be used "to measure comparative positions and trends in reporting" (Guthrie *et al.*, 2004b. p. 283). Several prior studies have discussed the use of content analysis to investigate accounting disclosure (see, e.g. Beattie and Thomson, 2007; Guthrie and Petty, 2000). The general findings of these studies claim that it is empirically valid to use content analysis in the corporate social, ethical, and environmental reporting fields. IC reporting is a relatively new area to be explored utilising content analysis (Abeysekera, 2008; Guthrie *et al.*, 2004b; Beattie and Thomson, 2007). Researchers in Australia were early adopters of this method to examine IC reporting practice in publicly listed companies (Guthrie *et al.*, 2004b). As a data analysing technique, content analysis involves codifying qualitative and quantifying information into various categories

based on selected criteria (Guthrie and Petty, 2000). Content analysis aims to analyse collected information systematically, objectively, and reliably (Guthrie and Parker, 1990; Guthrie *et al.*, 2004b). During the data analysis process of the present study, an IC measurement framework was developed to quantify the annual report data. In order to reduce the level of abstraction, IC was first operationalised into three categories, namely: external capital; internal capital; and human capital. The three categories were further broken down to facilitate coding and measurement.

The coding process used in this study to allocate quality measures to specific IC information was based on Schneider and Samkin (2008). A six-point scale was employed to assist the coding process. In order to maintain the reliability of the research approach taken for this study, the following rules were applied during the coding process:

- code for meaning rather than search for key words since some concepts are broad or because key words might not be adequate;

- classify one row as one sentence when coding tables;

- do not code if the concept is only implied; and

- record the highest measure (Yi and Davey, 2010; Schneider and Samkin, 2008) if an IC component is disclosed more than once in the same annual report.

The coding was cross-checked to ensure the validity and reliability of the study (Creswell, 2009; Sujan and Abeysekera, 2007). Two coders were used to code the annual reports. Each coder used components descriptions drawn from the literature to search for the presence or absence of IC-related components in a university's annual report and review. The coders then recorded the identified IC information onto a coding sheet for the purpose of comparing and discussing their results. Following this comparison, the definitions were amended slightly, and agreed between the two coders. The process was then repeated with other selected universities' annual reports until the coders agreed that the finally amended definitions reflected the actual university IC reporting context. The purpose of this process was to clarify grey areas in the classification process or in the identification of IC components that could result in inconsistencies when coding the annual reports. The two coders clarified these inconsistencies in the first ten annual reports. Thereafter each coder conducted the coding process independently.

4. Development of an IC framework for this study

The definition of IC categories has been generated from companies in various knowledge-intensive industries, including services, financial sector, pharmacy, fashion, and biotechnology industries. In contrast, IC research on higher educational institutions is relatively scarce. As stated earlier, because industry norms vary, the meaning that IC information carries also varies (Adrem, 1999). Therefore, the definition of three categories generated in prior company-based studies may not be directly applicable to a university context. For this reason, the definitions initially established for companies were modified by Sánchez *et al.* (2006) to apply to universities and research institutions as follows:

- Human capital is defined as the knowledge that the human resources (teachers, researchers, PhD students, and administrative staff in this case) would take with them if they left the institution.

- Organisational (internal) capital is defined as the knowledge that stays within the institution at the end of the working day. It comprises the governance principles, the organisational routines, procedures, systems, cultures, databases, intellectual property, etc.

- Relational (external) capital is defined as all resources linked to the external relationships of the institution such as "customers", "suppliers", R&D partners, government, etc. (p. 4).

Further, because universities are not-for-profit organisations, components originally referring to corporations were modified. For example, business collaboration was changed to business/university partnership. As the main focus of universities is on educating students, references to customers were replaced with students. For example, customer satisfaction or customer loyalty was changed to student satisfaction. Corporate culture was changed to university culture. Employee was changed to employees/ researchers. In addition, several other components were integrated as they are more likely to be reported by universities. Examples of these components include: research project, student database, employee experiences in the profession, employee's qualification, and cultural diversity. There are a total of 19 components. The final framework of IC components and descriptions is detailed in Table I.

5. Sample
The sample analysed for this study comprised 191 universities: eight universities from New Zealand, 39 universities from Australia, and 114 universities from the UK. It was decided to focus on New Zealand and Australia because of the close ties between these two countries. UK universities were selected because of the British influence on the other two countries.

All eight universities in New Zealand publish annual reports, and most past years' annual reports are available on the universities' web sites. However, Auckland University of Technology's (AUT) annual reports were obtained from AUT staff via e-mails as these reports were not available on the web site. The annual reports of most Australian universities are available on their web sites. The University of Notre Dame Australia was the only one whose annual reports are not available and it was, therefore, excluded from the study. With respect to universities in the UK, the number of universities analysed was reduced from 114 to 44 as the excluded universities (70 out of 114) published only financial statements or annual accounts rather than annual reports. Because prior studies in the field of IC disclosure in different countries have most frequently drawn upon annual reports, selecting the annual report as the sampling unit ensured consistency with prior IC content analysis studies.

6. Development of quality measuring system
In order to measure the quality of IC disclosure in annual reports, a quality measure which was drawn from prior IC disclosure studies (see Table II) was employed. A six-point measure (Yi and Davey, 2010) was used as it is comprehensive and allows more distinctions when assessing the quality of IC disclosure (see also Firer and Williams, 2003; Shareef and Davey, 2006; Schneider and Samkin, 2008). For the purpose of this study, the authors have used quality measures for scoring the text units for each of the components in the three IC categories. The maximum quality measure was 5. Schneider and Samkin (2008), however, noted that some components in the IC framework were of a descriptive nature and it was, therefore, difficult to assign quantitative or monetary value

Category	IC components	Descriptions	Maximum quality measure
Internal capital	Intellectual property	All copyright (in relation to phonograms and broadcasts), patent rights, plant varieties, registered and unregistered trademarks, and publications (journal, books, e-journals, chapters, etc.) held by sample university	5
	University culture	Comprising the vision, attitudes, experiences, beliefs, and values of a university	3
	Management philosophy	Information referred to in mission statement	3
	Management processes	Information relating to the process in the university	3
	Information system/ networking system	Information on the development, use application, and influence of systems	3
	Research projects	Research projects conducted by a university	5
	Financial relations	Information referring to the relationships between the university and its financial supporters	5
External capital	Brands	Information on brands associated with the university	3
	Students/student satisfaction	Information relating to students and their satisfaction about learning	5
	Business/university partnership	All the activities and collaboration between universities and other organisations (firms, non-profit organisations, public authorities, local government, and society as a whole)	5
	Student database	Database of all students	5
	Quality standards	Information referring to teaching quality or learning quality	3
Human capital	Work-related knowledge/ know-how	Individual competencies of researchers, knowledge or skill obtained from the job or training	3
	Employees	Information regarding staff, researchers, lecturers, PhD students, and administrative personnel	5
	Employee's experience in profession	Information referring to employees' international or national experiences in their profession	5
	Employee qualification	Information relating to employees' qualifications	5
	Employee compensation/ benefit	Information referring to welfare or other benefits for employees and PhD students provided by a university	5
	Cultural diversity	Demographic information of employees	3
	Training programme	Education or training programmes for employees provided by a university	5

Sources: Adapted from Sánchez et al. (2006), Schneider and Samkin (2008), and Yi and Davey (2010)

Table I.
Intellectual capital category, components, and descriptions

for those components. These components include: management philosophy; management processes; information system/networking system; university culture; university brand or image; quality standards; work-related knowledge/know-how; and cultural diversity. For those components, the maximum quality measure of 3 (see Table I) was assigned.

7. Results

This section presents the results generated from analysing the 2011 annual reports of universities in New Zealand, Australia, and the UK. The results generated from the three countries' universities were analysed in several different ways including: general performance levels of disclosures of IC categories and components; disclosure quality of categories and components; and overall performance of IC disclosure of universities.

7.1 New Zealand universities

The general performance of IC disclosure by New Zealand universities in the year of 2011 is viewed as being favourable. Victoria University of Wellington scored highest, with the University of Auckland scoring relatively lower due to the lack of IC information disclosed regarding external capital (Table III). Further, among the three IC categories of internal capital, external capital, and human capital, external capital is disclosed with higher quality, even if it is not one of the most disclosed categories. Of interest is that the IC component research project is the most favourable component disclosed by all eight universities with the highest disclosure quality. The least disclosed component is work-related knowledge/know-how which was disclosed by only three universities and has the lowest disclosure quality.

The top three performers were Victoria University of Wellington, the University of Otago, and Lincoln University which scored 0.67, 0.57, and 0.56, respectively out of a maximum possible value of 1. The University of Auckland, the University of Canterbury, and Massey University performed less well with means of 0.40, 0.47, and 0.47, respectively. The average mean from all universities is 0.51. Victoria University of Wellington and the

Quality measure	Explanation
Quantitative/monetary and descriptive – 5 points	IC component is clearly defined and quantified with a detailed descriptive statement
Quantitative/monetary – 4 points	IC component is clearly quantified
Descriptive – 3 points	IC component disclosure appeared and showed a significant impact on the organisation
Obscure – 2 points	IC component disclosure appeared with limited reference
Immaterial – 1 point	IC component was immaterial to the financial performance
Non-disclosure – 0 point	IC does not appear in the annual report

Table II.
Quality measuring system

New Zealand university	IC quality measure						Sum	Quality measure Max 1	Discursive disclosure (%)	Monetary measure (%)
	0	1	2	3	4	5				
Victoria University of Wellington	1	0	8	6	1	3	18	0.67	78	22
University of Otago	1	5	6	3	1	3	18	0.57	78	22
Lincoln University	4	0	6	6	1	2	15	0.56	80	20
University of Waikato	4	3	5	4	1	2	15	0.49	80	20
Auckland University of Technology	3	4	6	3	2	1	16	0.48	81	19
Massey University	4	4	5	2	3	1	15	0.47	73	27
University of Canterbury	4	2	6	6	0	1	15	0.47	93	7
University of Auckland	6	1	6	5	1	0	13	0.40	92	8
Average	3	2	6	4	1	2	16	0.51	82	18

Table III.
New Zealand universities' overall quality measure disclosure (2011)

University of Otago reported on 18 IC components out of a maximum possible 19 (see Table III). This level of disclosure outperformed that of the other universities. For example, the information provided by Auckland University's 2011 annual report related to only 13 IC components compared with an average disclosure quality measure of 16.

In addition, it is of importance to note that the quality of IC disclosure in New Zealand universities appears to be of concern. This is reflected by the finding that the majority of the disclosures were discursive in nature and, therefore, were allocated a measure of 3 or less. Massey University disclosed relatively higher monetary IC information with 27 per cent of its disclosure being quantitative. Overall, 82 per cent of total disclosure across all eight universities was discursive in nature. In general, the IC disclosure means of New Zealand universities is reasonable. This finding is reflected in their high means of disclosure across all three IC categories, although there were some low means in the human capital category for some universities (Table IV). For the internal capital category, the average mean was 0.52. Victoria University, the University of Otago, and the University of Waikato had the highest mean disclosure in the internal capital components. The lowest mean at 0.33 was for Massey University.

The top five IC components disclosed by NZ universities were: research project; cultural diversity; management processes; brands; and student satisfaction (see Table V). Among these components, research project was the highest value on average and was disclosed by all eight universities. Seven of them disclosed their research project using monetary terms and therefore were allocated four points or more. Further, cultural diversity, management processes, and brands were also disclosed by all eight universities. However, these components are of a descriptive nature and, therefore, it is difficult to assign quantitative or monetary value to these components. The least disclosed IC components were work-related knowledge, student database, and intellectual property. The low value of mean values allocated to these components was not only because of their low frequency of disclosure (e.g. work-related knowledge was disclosed by three out of eight universities), but also due to the IC information being disclosed in discursive terms.

7.2 Australian universities

The general performance of IC disclosure by the 38 Australian universities is viewed as favourable. The top three Australian universities were the Australian Catholic University, the University of Technology, Sydney, and the University of Adelaide with high-quality measures of 0.80, 0.76, and 0.75, respectively. The Australian Catholic University disclosed all IC components (19 components in total) in its annual report and also had the highest disclosure quality measure (Table VI). The worst performers were

New Zealand university	Internal capital mean	External capital mean	Human capital mean	Average mean
Victoria University	0.67	0.86	0.55	0.67
University of Otago	0.67	0.62	0.45	0.57
Lincoln University	0.52	0.62	0.55	0.56
University of Waikato	0.56	0.62	0.35	0.49
Auckland University of Technology	0.52	0.62	0.35	0.48
Massey University	0.33	0.67	0.45	0.47
University of Canterbury	0.44	0.62	0.39	0.47
University of Auckland	0.48	0.38	0.35	0.41
Average	0.52	0.63	0.43	0.51

Table IV.
New Zealand universities' IC quality disclosure by category overall

IC component	IC quality measure							Quality measure max 1	Discursive disclosure (%)	Monetary disclosure (%)
	0	1	2	3	4	5	Sum			
1.5 Research project	0	0	0	1	2	5	8	0.90	12.5	87.5
3.6 Cultural diversity	0	0	3	5	na	na	8	0.88	na	na
1.7 Management processes	0	1	2	5	na	na	8	0.83	na	na
2.1 Brands	0	1	2	5	na	na	8	0.83	na	na
2.2 Students/student satisfaction	1	0	0	0	3	4	7	0.80	0.0	100.0
2.5 Quality standard	0	0	5	3	na	na	8	0.79	na	na
3.2 Employee	0	0	0	4	2	2	8	0.75	50.0	50.0
2.3 Business/university partnership	0	0	2	3	1	2	8	0.68	62.5	37.5
1.4 Information system/networking system	2	0	3	3	na	na	6	0.63	na	na
1.6 Financial relations	0	1	5	1	1	0	8	0.45	87.5	12.5
3.4 Employee qualification	0	1	6	1	0	0	8	0.40	100.0	0.0
3.5 Employee compensation/benefit	2	0	4	1	1	0	6	0.38	83.3	16.7
1.2 University culture	3	1	4	0	na	na	5	0.38	na	na
3.3 Employee's experience in profession	1	2	3	2	0	0	7	0.35	100.0	0.0
1.3 Management philosophy	3	2	3	0	na	na	5	0.33	na	na
3.7 Training programme	4	0	4	0	0	0	4	0.20	100.0	0.0
1.1 Intellectual property	2	5	1	0	0	0	6	0.18	100.0	0.0
2.4 Student database	4	2	1	1	0	0	4	0.18	100.0	0.0
3.1 Work-related knowledge/know-how	5	3	0	0	na	na	3	0.13	na	na

Table V.
New Zealand universities' quality measures by IC component (mean – descending order)

Bond University, the University of New England, Charles Darwin University, La Trobe University, and James Cook University. These universities achieved relatively low measures of 0.39 (for the first four indicated universities) and 0.27, respectively. The average quality measure for Australian universities was 0.55.

The top two universities – the Australian Catholic University and the University of Technology, Sydney – reported the maximum 19 IC components in their 2011 annual reports. They were followed by the University of Adelaide, Macquarie University, and the University of New South Wales which reported 18 components. By contrast, James Cook University and the University of New England reported nine and ten IC components, respectively. The University of Canberra disclosed relatively higher monetary IC information with 42.9 per cent of its disclosure being quantitative in nature. In contrast, the University of Western Sydney reported relatively low monetary IC information making only 7.7 per cent quantitative disclosures. For the 38 Australian universities, 73.4 per cent of their annual report disclosures were discursive and 26.6 per cent quantitative. Consistent with those for New Zealand universities, the majority of disclosures made by Australian universities were discursive in nature.

Overall the quality of IC disclosures made by Australian universities is favourable. Given an IC average sum of 15 disclosures out of a maximum of 19 components, Australian universities appear to appreciate the importance of IC disclosures to their stakeholders with 78.9 per cent of IC components being disclosed. For the internal capital category, the average was 0.51 (Table VII). In total, 52 per cent of Australian universities (20 universities) had means higher than 0.51 (1 being the maximum value). The Australian Catholic University, Charles Sturt University, the University of Technology, Sydney, the University of Adelaide, and Griffith University had means higher than 0.70 and outperformed other universities. James Cook University had only a mean of 0.19.

Australian university	IC quality measure						Sum	Mean max 1	Discursive disclosure (%)	Monetary disclosure (%)
	0	1	2	3	4	5				
Australian Catholic University	0	3	3	5	1	7	19	0.80	57.9	42.1
University of Technology, Sydney	0	2	3	8	2	4	19	0.76	68.4	31.6
University of Adelaide	1	1	4	6	3	4	18	0.75	61.1	38.9
Charles Sturt University	2	0	3	8	3	3	17	0.72	64.7	35.3
University of Sydney	3	0	3	7	2	4	16	0.70	62.5	37.5
Macquarie University	1	2	4	8	1	3	18	0.67	77.8	22.2
University of New South Wales	1	3	6	4	0	5	18	0.66	72.2	27.8
University of South Australia	2	2	5	4	2	4	17	0.66	64.7	35.3
University of the Sunshine Coast	4	0	2	7	4	2	15	0.65	60.0	40.0
Edith Cowan University	4	2	2	5	3	3	15	0.61	60.0	40.0
University of Newcastle	2	4	4	3	3	3	17	0.61	64.7	35.3
University of Tasmania	2	2	5	7	0	3	17	0.61	82.4	17.6
Australian National University	4	1	4	5	2	3	15	0.60	66.7	33.3
University of Queensland	3	1	6	4	3	2	16	0.60	68.8	31.3
RMIT University	4	0	5	6	2	2	15	0.58	73.3	26.7
University of Southern Queensland	3	2	3	8	1	2	16	0.58	81.3	18.8
Murdoch University	3	2	6	4	1	3	16	0.57	75.0	25.0
University of Melbourne	3	2	5	6	1	2	16	0.56	81.3	18.8
University of Canberra	5	1	6	1	2	4	14	0.56	57.1	42.9
Central Queensland University	4	1	5	5	2	2	15	0.56	73.3	26.7
University of Wollongong	4	1	5	5	3	1	15	0.55	73.3	26.7
Victoria University	4	4	2	4	4	1	15	0.52	66.7	33.3
Flinders University	5	2	2	7	2	1	14	0.51	78.6	21.4
Griffith University	4	1	8	3	1	2	15	0.51	80.0	20.0
University of Ballarat	3	4	5	5	1	1	16	0.48	87.5	12.5
Monash University	6	2	4	4	0	3	13	0.47	76.9	23.1
Curtin University of Technology	6	1	4	4	4	0	13	0.47	69.2	30.8
Southern Cross University	6	2	1	8	2	0	13	0.46	84.6	15.4
Swinburne University of Technology	5	3	3	5	3	0	14	0.46	78.6	21.4
University of Western Australia	5	2	6	3	3	0	14	0.44	78.6	21.4
Deakin University	5	4	4	3	2	1	14	0.43	78.6	21.4
Queensland University of Technology	6	0	8	3	1	1	13	0.43	84.6	15.4
University of Western Sydney	6	2	3	7	1	0	13	0.42	92.3	7.7
Bond University	6	3	4	4	2	0	13	0.39	84.6	15.4
University of New England	9	1	1	5	2	1	10	0.39	70.0	30.0
Charles Darwin University	6	5	2	2	4	0	13	0.39	69.2	30.8
La Trobe University	4	6	4	3	2	0	15	0.39	86.7	13.3
James Cook University	10	2	4	1	2	0	9	0.27	77.8	22.2
Average	4	2	4	5	2	2	15	0.55	73.4	26.6

Table VI.
Australian
universities'
overall quality
disclosure (2011)

With respect to the external capital category, the average of the mean quality measure was 0.68. In total, 87 per cent of Australian universities (33 universities) had means of over 0.5. The Australian Catholic University, the University of Technology, Sydney, and the University of the Sunshine Coast scored means of 0.95 out of the maximum value of 1. In contrast, five universities (Griffith University, James Cook University, La Trobe University, Queensland University of Technology, and the University of Western Australia) had means below 0.5.

Australian university	Internal capital mean	External capital mean	Human capital mean	Average mean
Australian Catholic University	0.74	0.95	0.74	0.80
University of Technology, Sydney	0.74	0.95	0.65	0.76
University of Adelaide	0.81	0.76	0.68	0.75
Charles Sturt University	0.74	0.76	0.68	0.72
University of Sydney	0.63	0.81	0.68	0.70
Macquarie University	0.67	0.67	0.68	0.67
University of New South Wales	0.59	0.86	0.58	0.66
University of South Australia	0.52	0.71	0.74	0.66
University of the Sunshine Coast	0.56	0.95	0.52	0.65
Edith Cowan University	0.56	0.81	0.52	0.61
University of Newcastle	0.48	0.76	0.61	0.61
University of Tasmania	0.67	0.67	0.52	0.61
Australian National University	0.52	0.67	0.61	0.59
University of Queensland	0.44	0.67	0.68	0.59
RMIT University	0.63	0.81	0.39	0.58
University of Southern Queensland	0.56	0.81	0.45	0.58
Murdoch University	0.52	0.71	0.52	0.57
University of Melbourne	0.48	0.86	0.42	0.56
University of Canberra	0.41	0.67	0.61	0.56
Central Queensland University	0.44	0.52	0.68	0.56
University of Wollongong	0.52	0.71	0.45	0.54
Victoria University	0.41	0.67	0.52	0.52
Flinders University	0.44	0.62	0.48	0.51
Griffith University	0.74	0.43	0.35	0.51
University of Ballarat	0.30	0.62	0.55	0.48
Monash University	0.44	0.71	0.32	0.47
Curtin University of Technology	0.41	0.57	0.45	0.47
Southern Cross University	0.41	0.67	0.35	0.46
Swinburne University of Technology	0.30	0.62	0.48	0.46
University of Western Australia	0.63	0.43	0.29	0.42
Deakin University	0.33	0.71	0.32	0.43
Queensland University of Technology	0.52	0.48	0.32	0.43
University of Western Sydney	0.56	0.57	0.19	0.44
Bond University	0.26	0.67	0.32	0.39
University of New England	0.41	0.62	0.23	0.39
Charles Darwin University	0.41	0.57	0.26	0.39
La Trobe University	0.48	0.43	0.29	0.39
James Cook University	0.19	0.43	0.23	0.27
Average	0.51	0.68	0.48	0.54

Table VII.
Australian
universities' overall
IC quality disclosure
by category

The average for the human capital category was 0.48 out of a maximum value of 1. This very low mean of 0.48 should be of significant concern to the management of Australian universities given that the human capital category of the IC disclosures should be at a significantly higher level than its current level. This low mean can even suggest that universities do not place sufficient emphasis on the value of the contributions made by their staff to the universities' overall environment. Only 50 per cent of Australian universities had means higher than 50 per cent. This percentage is very low in comparison to the external capital category which scored 87 per cent and is only slightly lower than the internal capital category of 52 per cent. Further, the top mean for the external capital category is 0.95 i.e. also higher than for internal capital (0.81) and

human capital (0.74). Consequently, Australian universities disclosed high-quality external capital information.

The overall IC components disclosure by Australian universities is depicted in Table VIII. The top five IC components disclosed were management processes, brands, students/student satisfaction, employee, and quality standard. Among these components, the components brands, students/student satisfaction, and employee were disclosed by all 38 Australian universities. Management processes, with the highest mean, was disclosed by 37 universities, the exception being the Australian National University.

It is interesting to note that the three components of students/student satisfaction, employee, and research project were assigned more quantitative value than other components, with 94.74, 89.47, and 72.97 per cent information in terms of these three components' disclosure in Australian universities' annual reports. By contrast, intellectual property, employee qualifications, and training programme are three components that disclosed more qualitative information with percentages of 100, 88.57, and 81.82.

7.3 UK universities

The IC disclosure by the 44 UK universities making up this study shows an average quality measure mean of 0.42. This is significantly lower than the IC mean of universities in the other two countries studied. The best performing university – the University of Chester – disclosed 16 IC components in its 2011 annual report with higher disclosure quality than other universities. In contrast, the University of Chichester disclosed only eight components. Consistent with New Zealand and Australian universities, external capital disclosure by UK universities was better than for the other two IC categories. Two components – students/student satisfaction and brands – under the external capital

IC component	IC quality measure						Sum	Mean max 1	Discursive disclosure (%)	Monetary disclosure (%)
	0	1	2	3	4	5				
1.7 Management processes	1	2	5	30	na	na	37	0.89	na	na
2.1 Brands	0	1	10	27	na	na	38	0.89	na	na
2.2 Students/student satisfaction	0	0	0	2	19	17	38	0.88	5.26	94.74
3.2 Employee	0	0	1	3	19	15	38	0.85	10.53	89.47
2.5 Quality standard	1	1	13	23	na	na	37	0.84	na	na
1.5 Research project	1	1	2	7	12	15	37	0.78	27.03	72.97
3.6 Cultural diversity	3	7	12	16	na	na	35	0.69	na	na
2.3 Business/university partnership	1	2	6	13	5	11	37	0.67	56.76	43.24
1.2 University culture	4	8	12	14	na	na	34	0.65	na	na
3.5 Employee compensation/benefit	9	0	8	11	5	5	29	0.49	65.52	34.48
1.3 Management philosophy	7	11	17	3	na	na	31	0.47	na	na
1.6 Financial relations	9	2	12	4	6	5	29	0.46	62.07	na
1.4 Information system/networking system	13	8	11	6	na	na	25	0.42	na	na
3.4 Employee qualification	3	7	20	4	3	1	35	0.40	88.57	11.43
3.3 Employee's experience in profession	14	4	6	7	2	5	24	0.37	70.83	29.17
3.7 Training programme	16	5	5	8	3	1	22	0.29	81.82	18.18
3.1 Work-related knowledge/know-how	21	6	7	4	na	na	17	0.28	na	na
2.4 Student database	18	6	4	5	3	2	20	0.27	75.00	25.00
1.1 Intellectual property	30	5	3	0	0	0	8	0.06	100.00	0.00

Table VIII.
Australian universities' quality measures by IC component (mean – descending order)

category are disclosed by all 44 universities, and employee, which is under the internal category, is disclosed by all universities.

The top three overall IC disclosure performers were the University of Chester, Cardiff University, and the University of Hull which had means in 2011 of 0.59, 0.58, and 0.54, respectively, out of a maximum possible 1 (see Table IX). In contrast, the

UK university	IC quality measure							Quality measure max 1	Discursive disclosure (%)	Monetary disclosure (%)
	0	1	2	3	4	5	Sum			
University of Chester	3	2	4	5	3	2	16	0.59	68.8	31.3
Cardiff University	3	2	4	7	0	3	16	0.58	81.3	18.8
University of Hull	3	2	5	7	0	2	16	0.54	87.5	12.5
University of Sussex	5	2	5	2	2	3	14	0.52	64.3	35.7
University of Central Lancashire	2	4	5	6	1	1	17	0.52	88.2	11.8
Edge Hill University	3	2	6	5	3	0	16	0.52	81.3	18.8
University of Kent	5	4	1	5	1	3	14	0.51	71.4	28.6
University of East Anglia	4	2	7	2	3	1	15	0.49	73.3	26.7
University of Sheffield	4	2	5	6	1	1	15	0.49	86.7	13.3
University of Cumbria	4	4	2	7	0	2	15	0.49	86.7	13.3
University of Edinburgh	6	1	2	8	1	1	13	0.48	84.6	15.4
University of Cambridge	4	5	2	6	0	2	15	0.47	86.7	13.3
Newcastle University	2	6	5	3	3	0	17	0.47	82.4	17.6
University of Bath	4	4	5	3	1	2	15	0.47	80.0	20.0
University of Reading	5	3	4	4	1	2	14	0.47	78.6	21.4
Kingston University	6	1	6	2	2	2	13	0.47	69.2	30.8
University of Surrey	4	5	4	2	3	1	15	0.46	73.3	26.7
University of Bristol	4	4	5	4	0	2	15	0.46	86.7	13.3
University of Nottingham	7	3	2	2	3	2	12	0.44	58.3	41.7
University of Sunderland	4	5	3	5	1	1	15	0.44	86.7	13.3
University of Hertfordshire	4	4	6	3	1	1	15	0.43	86.7	13.3
The Robert Gordon University	5	4	2	6	2	0	14	0.43	85.7	14.3
University of Bradford	2	6	7	3	0	1	17	0.43	94.1	5.9
University of Northampton	6	3	4	4	0	2	13	0.42	84.6	15.4
Canterbury Christ Church University	5	2	5	7	0	0	14	0.42	100.0	0.0
University of Exeter	6	6	0	4	1	2	13	0.41	76.9	23.1
University of Leicester	3	8	4	1	2	1	16	0.41	81.3	18.8
University of Essex	6	5	1	4	2	1	13	0.41	76.9	23.1
University of Salford	5	6	2	2	4	0	14	0.41	71.4	28.6
University of Wolverhampton	5	3	6	3	2	0	14	0.41	85.7	14.3
Keele University	7	1	4	5	2	0	12	0.41	83.3	16.7
University of London	6	4	3	3	2	1	13	0.41	76.9	23.1
University of Lincoln	7	1	7	1	2	1	12	0.39	75.0	25.0
University of Manchester	5	6	4	2	0	2	14	0.38	85.7	14.3
University of Huddersfield	8	2	3	5	0	1	11	0.35	90.9	9.1
University of Leeds	9	1	4	3	1	1	10	0.34	80.0	20.0
University of West London	8	2	4	4	1	0	11	0.33	90.9	9.1
University of Glamorgan	9	3	3	0	4	0	10	0.32	60.0	40.0
York St John University	10	1	3	2	3	0	9	0.32	66.7	33.3
University of York	12	0	0	4	3	0	7	0.30	57.1	42.9
University of the West of England	9	3	3	2	2	0	10	0.29	80.0	20.0
Aston University	8	5	3	1	2	0	11	0.28	81.8	18.2
Anglia Ruskin University	11	2	3	1	2	0	8	0.24	75.0	25.0
University of Chichester	11	2	3	3	0	0	8	0.22	100.0	0.0
Average	6	3	4	4	2	1	13	0.42	80.1	19.9

Table IX.
UK universities' overall disclosure measures (2011)

University of Chichester, Anglia Ruskin University, and Aston University performed relatively poorly in their IC information disclosure with means of 0.22, 0.24, and 0.28, respectively. With regard to overall IC disclosure performance, the University of Chester, Cardiff University, the University of Hull, Newcastle University, and the University of Bradford disclosed 17 IC components out of a maximum possible 19. On the other hand, the University of York, Anglia Ruskin University, and the University of Chichester reported only seven, eight, and eight IC components, respectively, and thus are viewed as being relatively unfavourable in terms of overall IC disclosure performance.

Most IC disclosure (80.1 per cent) was reported in discursive terms. Of the 44 universities, the University of Nottingham and the University of Glamorgan were the only two universities that have monetary IC disclosure over 40 per cent and, therefore, outperformed other universities in terms of IC disclosure quality. Canterbury Christ Church University and the University of Chichester in particular failed to quantify any IC information they disclosed (0 per cent of monetary disclosure).

Table X breaks down the analysis to the three IC disclosure categories, namely: internal capital, external capital, and human capital. With regard to the internal capital category, the average was 0.38 out of a maximum value of 1. This result shows a very low average for the internal capital category for IC disclosures by UK universities. The highest average in this category was Edge Hill University's 0.70 followed by the University of Sussex at 0.56. All other 42 UK universities were below 0.50. This level of IC reporting by UK universities raises significant concerns with regard to the lack of focus that university management has with regard to what Sánchez *et al.* (2006) indicate about internal capital being "the knowledge that stays within the institution at the end of the working day. It comprises the governance principles, the organisational routines, procedures, systems, cultures, databases, intellectual property, etc." (p. 4).

With regard to the external capital category, the average of 0.59 is better than the internal capital category but, in comparison to New Zealand and Australian averages, is not favourable. However, 73 per cent of UK universities for this category had mean values above 0.50. With respect to the human capital category, the average figure was again disappointing with only an average mean value of 0.35; only three universities had means higher than 0.5 with the highest mean at 0.65 being achieved by the University of Chester. Thus, with regard to the three IC categories, external capital category had the highest mean (0.59 out of 1) indicating a relatively satisfactory quality of disclosure. Internal capital category scored the second highest mean at 0.38 followed by the human capital category at 0.35.

Overall, the average mean values of the three IC categories are of concern. The average for total IC categories is only 0.31 out of a maximum value of 1. The highest average value was achieved by the University of Chester but the value is only at 0.59. Only seven universities out of the 44 UK universities analysed achieved an overall average mean above 0.50 for the three categories. This result suggests that 84 per cent of UK universities were not giving IC disclosures any prominence as a vital value-creation driver for their institutions. Added to this finding is the crucial fact that 70 universities out of the 114 UK universities selected for this study were initially dropped from the study as they had only annual financial statements published. Guthrie *et al.* (2012) write that "value is no longer measured solely on the basis of financial outcomes; rather the value of activities that develop knowledge resources must also be considered. Doing so helps us understand how employees, customers and activities contribute to value creation, leading us to the challenge of how to identify, measure and report on the value of our knowledge resources" (p. 68).

UK university	Internal capital mean	External capital mean	Human capital mean	Average mean
University of Chester	0.48	0.67	0.65	0.59
Cardiff University	0.41	0.76	0.61	0.58
University of Hull	0.44	0.86	0.42	0.54
University of Sussex	0.56	0.67	0.39	0.52
Edge Hill University	0.70	0.62	0.29	0.52
University of Central Lancashire	0.41	0.76	0.45	0.52
University of Kent	0.37	0.71	0.48	0.51
University of Sheffield	0.37	0.76	0.42	0.49
University of East Anglia	0.48	0.62	0.42	0.49
University of Cumbria	0.37	0.71	0.45	0.49
University of Edinburgh	0.37	0.86	0.32	0.48
Newcastle University	0.44	0.57	0.42	0.47
University of Bath	0.33	0.71	0.42	0.47
University of Reading	0.48	0.62	0.35	0.47
University of Cambridge	0.48	0.67	0.32	0.47
Kingston University	0.37	0.48	0.55	0.47
University of Surrey	0.44	0.52	0.42	0.46
University of Bristol	0.26	0.67	0.48	0.46
University of Sunderland	0.37	0.67	0.35	0.44
University of Nottingham	0.44	0.81	0.19	0.44
Robert Gordon University	0.37	0.62	0.35	0.43
University of Hertfordshire	0.37	0.52	0.42	0.43
University of Bradford	0.37	0.57	0.39	0.43
University of Northampton	0.22	0.67	0.42	0.42
Canterbury Christ Church University	0.41	0.62	0.29	0.42
University of Salford	0.48	0.48	0.29	0.41
University of Essex	0.26	0.62	0.39	0.41
University of Exeter	0.41	0.48	0.35	0.41
University of Leicester	0.37	0.62	0.29	0.41
University of Wolverhampton	0.33	0.52	0.39	0.41
University of London	0.33	0.57	0.35	0.41
Keele University	0.44	0.57	0.26	0.41
University of Lincoln	0.26	0.67	0.32	0.39
University of Manchester	0.37	0.52	0.29	0.38
University of Huddersfield	0.22	0.76	0.19	0.35
University of Leeds	0.44	0.43	0.19	0.34
University of West London	0.33	0.48	0.23	0.33
York St John University	0.37	0.33	0.26	0.32
University of Glamorgan	0.37	0.43	0.19	0.32
University of York	0.37	0.48	0.13	0.30
University of the West of England	0.33	0.38	0.19	0.29
Aston University	0.30	0.29	0.26	0.28
Anglia Ruskin University	0.26	0.29	0.19	0.24
University of Chichester	0.22	0.19	0.23	0.22
Average	0.38	0.59	0.35	0.31

Table X.
UK universities'
overall IC disclosure
by category

The top five IC components disclosed were students/student satisfaction, brands, employee, research project, and management processes (Table XI). The first three components were disclosed by all 44 UK universities, followed by research project that was disclosed by 43 universities. Information on intellectual property and training programmes was disclosed by only five universities, with means of 0.05 and 0.03 out of

IC components	IC quality measure						Sum	Mean max 1	Discursive disclosure (%)	Monetary disclosure (%)
	0	1	2	3	4	5				
2.2 Students/student satisfaction	0	0	0	6	20	18	44	0.85	13.64	86.36
2.1 Brands	0	3	15	26	na	na	44	0.84	na	na
3.2 Employee	0	0	0	9	22	13	44	0.82	20.45	79.55
1.5 Research project	1	1	3	23	9	7	43	0.67	62.79	37.21
1.7 Management processes	3	10	15	16	na	na	41	0.67	na	na
3.6 Cultural diversity	6	10	15	13	na	na	38	0.60	na	na
2.3 Business/university partnership	5	3	4	21	7	4	39	0.55	71.79	28.21
2.5 Quality standard	10	8	14	12	na	na	34	0.55	na	na
1.2 University culture	15	11	11	7	na	na	29	0.41	na	na
1.3 Management philosophy	8	23	13	0	na	na	36	0.37	na	na
1.6 Financial relations	12	11	6	6	6	3	32	0.36	71.88	na
3.4 Employee qualification	5	5	27	7	0	0	39	0.36	100.00	0.00
3.1 Work-related knowledge/know-how	22	12	8	2	na	na	22	0.26	na	na
3.3 Employee's experience in profession	14	14	12	3	0	1	30	0.24	96.67	3.33
2.4 Student database	22	4	10	7	1	0	22	0.22	95.45	4.55
1.4 Information system/networking system	25	13	5	1	na	na	19	0.20	na	na
3.5 Employee compensation/benefit	23	9	6	4	1	1	21	0.19	90.48	9.52
1.1 Intellectual property	39	3	0	1	1	0	5	0.05	80.00	20.00
3.7 Training programme	39	3	2	0	0	0	5	0.03	100.00	0.00

Table XI.
Overall UK universities' quality disclosure by IC component (mean – descending order)

maximum possible 1. The gap between the most disclosed components and the least disclosed components is large.

Most IC components were disclosed in a narrative form, particularly training programme (100 per cent), employee's experience in profession (96.67 per cent), and student database (95.45 per cent). However, two components students/student satisfaction and employee were disclosed in a monetary or quantitative manner with figures of 86.36 and 79.55 per cent. These two components were disclosed by all 44 universities. UK universities tended to focus on these disclosures.

8. Comparative analysis

An IC category-wise comparative analysis of IC disclosure quality among the universities in the three countries was made (see Table XII). With respect to the disclosure quality mean measure of universities in these three countries, the external capital category had the highest average among the three categories, followed by internal capital and human

	Internal capital average mean	External capital average mean	Human capital average mean	Average overall IC mean
New Zealand university	0.52	0.63	0.43	0.51
Australian university	0.51	0.68	0.48	0.55
UK university	0.38	0.59	0.35	0.42

Table XII.
Comparisons of IC disclosure mean among the three countries

capital. In addition, Australian universities averaged 0.55 out of a maximum possible 1 on average. This value showed that Australian universities outperformed the average mean of universities in New Zealand at 0.51 and UK universities at 0.42.

Management processes and research project were the two internal capital components that scored favourably for universities in all three countries (Figure 1). Universities in Australia placed more focus on disclosing their university culture, which scored 0.65 out of a maximum possible 1, whereas the quality measure of university culture for universities in New Zealand and the UK was relatively lower (below 0.4). Moreover, disclosure quality of intellectual property for all three countries appears to be more of a concern as their average disclosure means were all below 0.20 out of a maximum 1.

The overall quality measure for the external capital is favourable compared with the other two IC categories (see Table XII for details). Quality standard, partnership, students, and brands were the four external capital components that scored favourably with the average means of the four components being over 0.60 (Figure 2). In contrast, student database was the only component that scored relatively weakly. Further, it is important to note that, for universities in the UK, quality standard (0.55) and partnership (0.55) did not score as well as they did for universities in the other two countries.

However, the overall quality measure for the human capital category is unfavourable when compared with the other two IC categories. Cultural diversity and employee were the only two IC components that scored relatively well (Figure 3). The IC disclosure quality for other components including training programme, employee compensation, qualification, experience, and know-how appear to be of concern.

9. Longitudinal analysis

In the longitudinal analysis, the study utilised results derived from universities' annual reports for a three-year period (2009-2011) with the intention of identifying potential trends for IC information disclosure. The quality of IC disclosure has increased for seven of New Zealand's eight universities, the exception being the AUT (Table XIII). For Australian universities, the quality of IC disclosure has increased for 36 out of 38
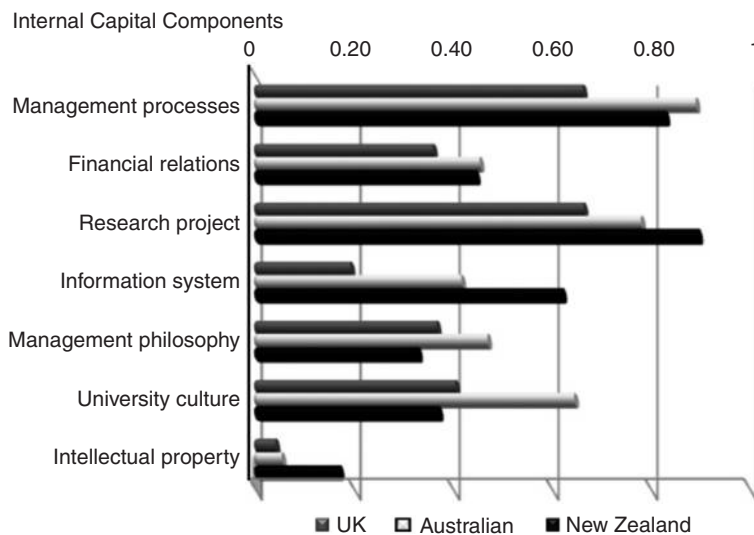

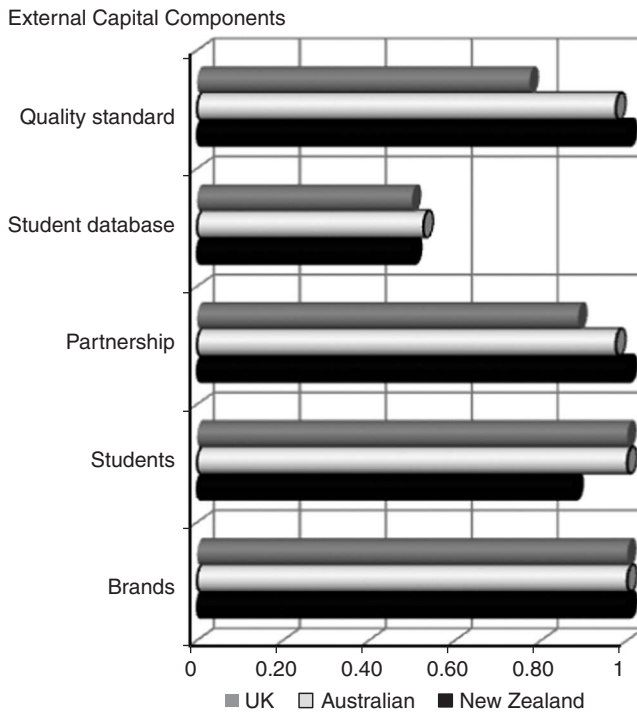**Figure 1.**
Comparative analysis of internal capital components

External Capital Components

Figure 2.
Comparative
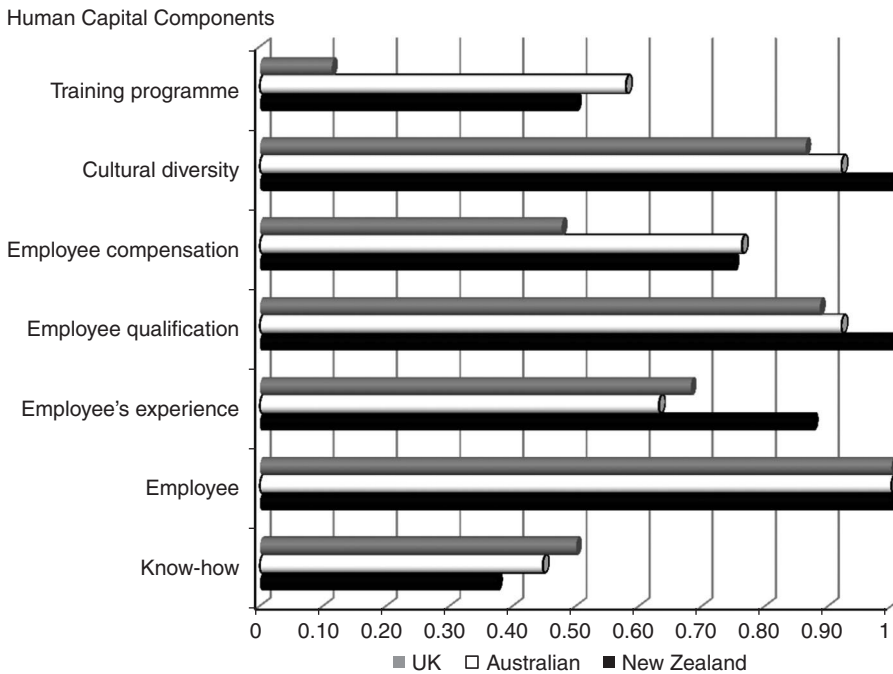analysis of external
capital components

Human Capital Components

Figure 3.
Comparative
analysis of human
capital components

New Zealand university	2009	2010	2011	Growth rate (three years) (%)
Massey University	0.30	0.41	0.39	30
Lincoln University	0.43	0.56	0.52	21
University of Auckland	0.38	0.54	0.44	16
University of Waikato	0.38	0.38	0.42	11
University of Otago	0.48	0.53	0.53	10
University of Canterbury	0.42	0.44	0.44	5
Victoria University of Wellington	0.63	0.65	0.65	3
Auckland University of Technology	0.47	0.47	0.47	0
Average	0.44	0.50	0.48	9

Table XIII.
New Zealand IC disclosure quality (2009-2011)

universities (Table XIV). Curtin University of Technology was the only university that failed to increase its quality measure over the three years. Similar to the trends identified in the other two countries' universities, most of the UK universities analysed (42 out of 44) improved the quality of their IC disclosures (Table XV). However, the IC disclosure quality measure for Anglia Ruskin and Aston universities remained unchanged.

IC components disclosure by universities in all three countries has improved in terms of both most disclosed component and disclosure quality (Table XVI). In terms of New Zealand universities' reporting, student database, university culture, and brands have been reported more frequently over the last three years compared with IC information related to training programme, intellectual property, and employee's experience which had been allocated more measures as a result of their improved disclosure quality.

New Zealand universities placed more focus on disclosing their research projects, business/university partnership, and employee compensation in monetary terms, which is also an indicator of high quality of disclosure. Australian universities' disclosures of IC information that related to intellectual property, student database, and information system have improved in both their disclosure and disclosure quality. Student satisfaction, employee, and research project had more focus in terms of monetary disclosure. UK universities more frequently disclosed IC information regarding work-related knowledge, intellectual property, and employee compensation. Higher quality of disclosure was found in their disclosure of work-related knowledge, employee's experience, and university culture. Further, employee, student satisfaction, and research project have been disclosed more quantitatively.

10. Discussion
Overall, the results show that New Zealand and Australian universities' IC disclosure outperforms the IC reporting practice of UK universities. As for New Zealand universities, Victoria University of Wellington scored the highest among the eight universities. A high level of quality was found with the disclosure of the external capital category. Further, research project was the most favourable IC component. Not only was it disclosed by all eight universities, but it also had the highest disclosure measure compared with other IC components. With respect to Australian universities, the Australian Catholic University is the top performer as a result of both its high levels of disclosure and quality of IC disclosure. As was the case with New Zealand

Australian university	2009	2010	2011	Growth rate (three years) (%)
James Cook University	0.19	0.19	0.27	42
University of Southern Queensland	0.43	0.49	0.58	35
University of Western Sydney	0.32	0.32	0.42	32
Bond University	0.30	0.33	0.39	30
University of Adelaide	0.59	0.70	0.75	27
Macquarie University	0.53	0.61	0.67	26
Charles Sturt University	0.58	0.61	0.72	24
University of Ballarat	0.39	0.40	0.48	23
Griffith University	0.42	0.40	0.51	21
University of Technology, Sydney	0.63	0.72	0.76	21
Edith Cowan University	0.55	0.53	0.61	20
University of Canberra	0.47	0.48	0.56	19
University of New South Wales	0.56	0.65	0.66	18
Southern Cross University	0.39	0.39	0.46	18
RMIT University	0.49	0.56	0.58	18
University of Tasmania	0.52	0.54	0.61	17
University of Wollongong	0.47	0.49	0.55	17
Australian National University	0.52	0.57	0.60	15
Murdoch University	0.51	0.55	0.57	12
Swinburne University of Technology	0.41	0.46	0.46	12
University of Western Australia	0.39	0.42	0.44	13
University of Newcastle	0.54	0.54	0.61	13
University of Queensland	0.54	0.60	0.60	11
La Trobe University	0.35	0.33	0.39	11
Australian Catholic University	0.73	0.77	0.80	10
University of Melbourne	0.51	0.53	0.56	10
Deakin University	0.39	0.39	0.43	10
Monash University	0.43	0.39	0.47	9
Flinders University	0.47	0.46	0.51	9
Charles Darwin University	0.36	0.34	0.39	8
University of New England	0.36	0.37	0.39	8
University of South Australia	0.61	0.62	0.66	8
Central Queensland University	0.52	0.56	0.56	8
Victoria University	0.48	0.48	0.52	8
University of Sydney	0.66	0.63	0.70	6
University of the Sunshine Coast	0.63	0.63	0.65	3
Queensland University of Technology	0.42	0.44	0.43	2
Curtin University of Technology	0.47	0.46	0.47	0
Average	0.48	0.50	0.55	15

Table XIV.
Australian IC
disclosure quality
(2009-2011)

universities, the external capital category is also the most favourable IC reporting category and management process is the most reported IC component. With regard to universities in the UK, the general performance of IC disclosure is not that favourable. The top performer in this country was the University of Chester which reported 16 out of 19 IC components, giving it higher disclosure quality than other UK universities. In line with the other two countries, students, brands, and employees were the three components disclosed by all 44 of the UK universities analysed.

The differences in IC reporting disclosures and quality identified for universities in New Zealand, Australia, and the UK are congruent with results generated from several prior studies. For example, Boesso and Kumar (2007) examined IC reporting in the contexts

UK university	2009	2010	2011	Growth rate (three years)
University of Hertfordshire	0.29	0.28	0.43	48
University of Cumbria	0.35	0.43	0.49	40
University of Bath	0.34	0.37	0.47	38
University of Salford	0.30	0.34	0.41	37
University of Leeds	0.25	0.33	0.34	36
University of Bradford	0.32	0.34	0.43	34
University of Kent	0.38	0.46	0.51	34
Edge Hill University	0.39	0.49	0.52	33
University of Sunderland	0.34	0.42	0.44	29
The University of Nottingham	0.34	0.42	0.44	29
The University of Hull	0.42	0.49	0.54	29
York St John University	0.25	0.28	0.32	28
University of Wolverhampton	0.32	0.41	0.41	28
The University of Northampton	0.34	0.41	0.42	24
University of Surrey	0.37	0.46	0.46	24
University of Bristol	0.37	0.42	0.46	24
University of London	0.33	0.39	0.41	24
University of West London	0.27	0.30	0.33	22
University of Chichester	0.18	0.18	0.22	22
University of Huddersfield	0.29	0.35	0.35	21
Keele University	0.34	0.41	0.41	21
University of Central Lancashire	0.43	0.48	0.52	21
University of Leicester	0.34	0.39	0.41	21
University of Sussex	0.44	0.44	0.52	18
University of East Anglia	0.42	0.46	0.49	17
University of the West of England	0.25	0.29	0.29	16
University of Lincoln	0.34	0.38	0.39	15
The University of Manchester	0.33	0.37	0.38	15
The University of Edinburgh	0.42	0.48	0.48	14
The University of Sheffield	0.43	0.44	0.49	14
Canterbury Christ Church University	0.38	0.42	0.42	11
University of Chester	0.53	0.54	0.59	11
Kingston University	0.43	0.46	0.47	9
University of Cambridge	0.43	0.44	0.47	9
University of Reading	0.43	0.44	0.47	9
University of Exeter	0.38	0.38	0.41	8
The University of York	0.28	0.30	0.30	7
Cardiff University	0.54	0.57	0.58	7
University of Glamorgan	0.30	0.32	0.32	7
The Robert Gordon University	0.41	0.43	0.43	5
University of Essex	0.39	0.39	0.41	5
Newcastle University	0.46	0.46	0.47	2
Anglia Ruskin University	0.24	0.24	0.24	0
Aston University	0.28	0.28	0.28	0
Average	0.36	0.39	0.42	15

Table XV.
UK IC disclosure
quality (2009-2011)

of the USA and Italy, reporting that country context does affect the volume of IC reporting. Similar results were also found in Vandemaele *et al.* (2005) and Abeysekera (2007). In addition, the relatively unfavourable performance of universities in the UK regarding their IC reporting is not surprising as Vandemaele *et al.* (2005) also found that IC reporting by companies in Sweden outperformed IC reporting by UK public-listed companies.

The relatively favourable IC reporting performance in Australian and New Zealand universities could be explained by the fact that a substantially large set of prior empirical studies regarding IC reporting in Australia and New Zealand indicates that the importance of IC reporting has been well recognised in these two countries. Further, the moderately increasing trends identified for universities in all three countries are consistent with the findings of a number of prior studies (see, e.g. Williams, 2001; Bozzolan et al., 2003; Petty and Cuganesan, 2005; Vandemaele et al., 2005; Abeysekera, 2008) that examined IC reporting in a corporate context. The findings of those studies consistently indicated the level of IC reporting had increased over the examined period. A possible explanation for the upward increase could be that global competition for IC requires organisations to strengthen stakeholders' confidence by means of proactively reporting their IC information (Vandemaele et al., 2005).

However, the lack of a significant increase over the period 2009-2011 for universities in all three countries can be attributed to two reasons. First, there was no need to significantly increase the level of IC reporting as universities have met the information requirements by their stakeholders (Vandemaele et al., 2005). Second, as pointed out by Williams (2001), potential costs associated with IC reporting could prevent universities from increasing these disclosures. This possibility is particularly the case for universities in the UK which disclosed less IC information, as they may have arrived at the point where these costs act as a disincentive to disclose more IC information.

In addition universities placed more focus on reporting human and internal capital and this finding is inconsistent with general results derived from prior studies which found that the external capital was the most disclosed category followed by internal capital and human capital (Guthrie and Petty, 2000; Bozzolan et al., 2003; Whiting and Woodcock, 2011). This inconsistency was attributable to a higher level of reporting in human capital and internal capital components in universities on cultural diversity, employee, research projects, and management processes in particular.

Moreover, the inconsistency could be explained in terms of an argument put forward by Sujan and Abeysekera (2007), that is, given the voluntary nature of IC reporting and no established and generally accepted IC reporting framework for organisations to adopt, the content and frequency of IC reporting would vary across organisations and industry sectors. Furthermore, an alternative reason for universities placing more importance on internal capital and human capital could be the major changes happening in universities, resulting in frequent engagement in conducting research projects, training employees, and improving management process. In addition, as Sujan

| Country | Most improved IC disclosure component (2009-2011) | | |
	Most disclosed	Quality	Monetary disclosure
New Zealand	Student database	Training programme	Research projects
	University culture	Intellectual property	Business/university partnership
	Brands	Employee's experience	Employee compensation
Australia	Intellectual property	Intellectual property	Students satisfaction
	Student database	Student data base	Employees
	Information system	Information system	Research projects
UK	Work-related knowledge	Work-related knowledge	Employees
	Intellectual property	Employee's experience	Student satisfaction
	Employee compensation	University culture	Research project

Table XVI.
Summary of the most improved IC components in reporting

and Abeysekera (2007) noted, attributing importance to reporting internal capital elements such as management processes and networking systems may be a response to the erosion of investor trust in corporate financial information after highly publicised corporate collapses. Management would, therefore, be inclined to portray the organisation as having a strong and transparent networking system, positive corporate culture, and effective management processes to protect and enhance stakeholders' interest. Although this argument may not be directly applicable to education sector, it does provide some insight into why the management of an organisation places more focus on reporting internal capital related IC information.

11. Conclusion
This is the first comparative study of IC voluntary disclosures of selected universities in New Zealand (eight), Australia (38), and the UK (44). This study examined the quality of the voluntary disclosure of IC made by these universities. An IC framework was developed to measure IC reporting in the university sector. Using content analysis, 2011's annual reports were examined before undertaking a three-year period comparative analysis. New Zealand and Australian universities outperformed the UK universities in terms of IC disclosures. The study found moderate increases in the levels of IC disclosures over the period of the study. The quality of IC disclosures by New Zealand universities was generally higher than that of their Australian and UK counterparts. Internal capital and human capital were the most disclosed categories with external capital being the least disclosed in all three countries. However, the quality of external capital disclosures was higher than that of internal and human capital. Finally, most IC disclosures were narrative in nature.

This study contributes to the understanding of the current voluntary reporting of IC by addressing the gap in empirical research regarding IC reporting in universities. Second, an IC framework was developed to specifically measure the quality of IC disclosure in universities. This framework could be utilised and further modified by future researchers who examine universities in other jurisdictions or study other educational institutions. A key feature of this framework is that it examined both the level of disclosures and compared the quality of IC disclosure practice. In this aspect it differs from many prior studies that assessed mainly the extent of the IC disclosure. Third, the results generated from this study provide insights into the nature of voluntary reporting in universities. These findings could be used by management of the universities, regulators, and standard-setting bodies as they seek to improve the reporting of IC in universities. Finally, the results generated from this study could be utilised by future researchers as a basis to facilitate comparative research in identifying possible trends, similarities, and distinctions of IC disclosure practice in universities and/or other knowledge-based industries across different jurisdictions.

Despite the contributions outlined, this study is subject to a number of limitations. First, this study examined data of three financial years only (2009, 2010, and 2011). It is, therefore, difficult to draw conclusive trends that could show IC disclosure change over three years, that is, it may have been more insightful to see the five- or ten-year changes of IC disclosure. Second, the framework developed was viewed as being able to reflect the IC disclosure trends in universities. However, this study recognises that some of the components incorporated here may be irrelevant, depending on different researchers' perspectives of IC. Third, similar to other IC disclosure studies of this nature, content analysis utilisation may involve the application of judgement in determining whether

an IC component should be assigned to a given IC category. Although every effort was made to ensure reliability of the coding process and to minimise error, possible subjectivity may still have occurred during the coding process.

Several avenues are suggested for future research in this field. First, given that there are an increasing number of universities disclosing more IC related information on their web sites, future research could examine IC disclosure on universities' web sites. In addition, differentiating universities in terms of whether they were public or private; small or large; and even by their organisational structure (centralised or decentralised) might provide further insights into the extent and quality of IC disclosures by these universities. Second, the authors suggest that other research methodologies could be adopted. For example, interviews or questionnaires could probably generate additional data to enrich understanding of the IC disclosure practice. Third, considering the lack of a generally acceptable framework, developing such a framework to assist organisations' voluntary reporting of IC could be a focus of future research.

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