Full reference: Adhikariparajul, M., Hassan, A., Fletcher, M., & Elamer, A.A. (2020) 'Integrated Reporting in Higher Education: Insights from Scotland, Northern Ireland and Wales', *Social Responsibility Journal*, Forthcoming, DOI (10.1108/SRJ-01-2019-0031) (Accepted 9th February 2020).

Integrated Reporting in Higher Education: Insights from Scotland, Northern Ireland and Wales

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Integrated Reporting in Higher Education: Insights from Scotland, Northern Ireland and Wales

Abstract

Purpose – This paper examines the level of disclosure on content elements of Integrated Reporting (IR) in Scotland, Northern Ireland and Wales Higher Education Institutions (HEIs). We suggest that integrated thinking is an internal process that organizations can follow to produce integrated reporting that can be used as an effective mechanism to enhance accountability with stakeholders.

Design/methodology/approach – International Integrated Reporting Council (IIRC) guidelines and content analysis are used to analyse IR content elements in HEI reports from 2014-2016.

Findings– The results indicate a significant increase in the trend and extent of IR content elements. The HEI specific characteristics examined, such as the establishment of HEI; adoption of IR framework and governing board size are all statistically and positively associated with IR content elements disclosure. This paper introduces signalling theory to explore the idea that appropriate communication via integrated thinking can close the gap between the organization and its stakeholders via increased level of disclosure on IR content elements.

Practical implications- The results will assist policymakers and regulators to assess the benefits of voluntary implementation of IR at HEIs and evaluate possible mandatory implementation of IIRC guidelines. Second, the findings can assist managers of institutions interested in implementing integrated reporting.

Social implications- The study recommends universities to explicitly address IR issues in reporting as this will increase their impact as leaders of educational thought in addition to their roles as partners, advisors, counsellors and assessors.

Originality/ value- The study explores whether HEIs in Scotland, Northern Ireland and Wales provide disclosure on IIRC content elements as a reflection of integrated thinking and whether the connectivity and interdependence between different departments will help to signal to stakeholders how HEIs create value for society.

Keywords- Integrated Reporting, integrated thinking, Higher Education Institutions, content analysis, signalling theory

Paper type- Research paper

1. Introduction

Although universities are places of education, vessels for researchers, crucibles for innovators and receptacles for leadership, they are poor at communicating their contribution and value-added to wider society (British Universities Finance Directors Group (BUFDG), 2016). This research examines the evolution of corporate reporting by HEIs towards a more integrated approach, termed Integrated Reporting (IR) (Paloma Sanchez *et al*., 2009; Fonseca *et al*., 2011; Hinson *et al.,* 2015; Sangiorgi and Siboni, 2017; Brusca *et al.,* 2018; Ferrero–Ferrero *et al*., 2018). The main motivation for this study is that higher education has its own specific challenges - including international competition, student recruitment, research funding and student expectations - that make the connection and the interdependence between its departments, through integrated thinking, crucial to provide relevant information to stakeholders on value creation via integrated reporting (BUFDG, 2016). The provision of this relevant information will lead to better communication between the organization and its stakeholders, supporting a signalling theory interpretation (Zutshi *et al.,* 2018). Therefore, we are suggesting that integrated thinking is an internal process that organizations can follow to produce integrated reporting that will be used as a communication tool with stakeholders. Additionally, since the inception of IR, it has been of more interest to public sector researchers than public sector organizations, suggesting a lack of awareness of the potential value of IR to the public sector.

The main objective of this paper is to better understand whether HEIs in Scotland, Northern Ireland and Wales provide disclosure on one of International Integrated Reporting Council (IIRC) guidelines - content elements - as a reflection of integrated thinking and whether the connectivity and interdependence between different departments will signal to

stakeholders how HEIs create value for society (Secundo *et al.,* 2016; Higgins *et al.,* 2019; Zutshi *et al.,* 2018).

The main contribution of this study is to address four different aspects of IR. First, this paper contributes to the link between integrated reporting and integrated thinking research (Katsikas *et al*., 2016; Adams, 2017; Rinaldi *et al.,* 2018). Second, the research introduces signalling theory to promote the idea that appropriate communication via integrated thinking can close the gap between the organization and its stakeholders via disclosure (Zutshi *et al.,* 2018). Third, our paper investigates whether the disclosure of IR content elements reflects the implementation of an integrated thinking approach (Higgins *et al.,* 2019; Stacchezzini *et al.,* 2019). Fourth, it investigates IR in HEIs as suggested by Adams, (2018). Fourth, our paper is a response to call for research on IR adoption in UK HEIs (Adams, 2018). This is because there are few prior IR studies in the HEIs implemented in other countries. For example, Veltri and Silvestri, (2015) investigated IR in Free State University in South Africa. Chatelain–Ponroy and Morin–Delerm, (2016) in France, Nomura and Abe, 2010 (Japan). To the best of the authors' knowledge, this study is one of the few that investigates IR content elements in the HEI sector (Hassan *et al.,* 2019). Our paper is an extension of the study by Hassan et al. (2019)that focuses on IR in UK higher education from an institutional theory perspective. However, our study employs signalling theory to investigate whether the increased level of disclosure on IR content elements is a reflection of integrated thinking . Also, most of the sample data (80%) in the study by Hassan et al. (2019) comes from English universities, which may drive the results. We extend and complement their line of research by adopting signalling theory perspective to examine whether the increased level of disclosure on IR content elements is a reflection of implementing integrated thinking. The research employs content analysis based on annual reports published between 2014 and 2016 and the HEIs selected for this study are situated in Scotland, Northern Ireland and Wales.

This paper will proceed as follows: the next section will explain the link between integrated reporting and integrated thinking. This is followed by a discussion on signalling theory in higher education. The following section provides a literature review on IR and develops the hypotheses. The paper then turns to the methods and empirical findings derived from the comparative analysis of HEI annual reports. The results are discussed and in the final section, the paper draws conclusions and provides recommendations for future research.

2. Integrated Reporting and integrated thinking

Integrated reporting (IR) has been developed to provide a combined disclosure of financial and non-financial information. This is achieved by the publication of a single report from the perspective of stakeholders (King IV, 2016; Soh *et al*., 2015; Reimsbach *et al*., 2017).

Integrated thinking, on the other hand, is defined as "*the reflection of connectivity and interdependencies between various factors which affect an organisation`s value creation capacity*" (King IV, 2016 p. 13). The IIRC (2013) asserts that integrated thinking supports integrated decision making and actions for short, medium and long-term value creation by making an active relationship between different operating and functional units. Recently, there is a number of studies address integrated thinking. For instance, Del Baldo, (2017) points out that integrated thinking is linked to the strategic management process and can facilitate organizational operation by changing the whole organizational culture through collaboration between different internal units to gain a better understanding and appreciate the impact of their behaviour and decision on their organization`s stakeholders. Moreover, it is argued that by using an integrated thinking approach, organizations can switch to forward-thinking to report future growth prospects and deal with uncertainty (Alberti–Alhaybat, 2018; Massingham *et al.,* 2019). Additionally, internal communication can lead to the development of integrated thinking as organizations embed economic, sustainability and governance-related performance within their strategic and operational processes (Camilleri, 2018; Higgins *et al.,* 2019).

Another stream of studies explores the link between integrated thinking and integrated reporting. The study of Katsikas *et al*. (2016) suggests that in order to adopt IR in practice, companies should develop integrated thinking inside the organisation and related disclosures should be the final step towards IR. In this vein, Adams (2017) suggested steps that should be followed in integrated thinking and IR: 1) developing an understanding of sustainable development issues within the organizations external environment; 2) identifying material sustainability issues; 3) developing a business model to connect strategy and sustainability; 4) developing integrated thinking, 5) connectivity and governance; 6) and preparing the integrated report. Rinaldi *et al*. (2018) argue that an organization`s integrated thinking and IR are strongly linked and that IR is an effective mechanism of enhancing accountability. Likewise, the Chartered Institute of Management Accountants (CIMA, 2017), suggest that IR is the output of integrated thinking which enables organizations to "live their story" rather than merely "tell it". In addition, the studies of Guthrie *et al.* (2017) and Cavicchi *et al.* (2019) recommend the implementation of integrated thinking in the public sector.

In terms of applying integrated thinking in higher education, in their case study of a South African university, Veltri and Silvestri (2015) argue that if HEIs manage to disclose business as a whole, providing relevant information to their stakeholders in a concise, consistent and comparable format by adopting integrated thinking as internal cultural and organisational mechanism, they will achieve competitive advantage where they are able to differentiate their position from others with consequent reputational benefits. However, in the context of Spanish HEIs, Brusca *et al*. (2018) suggest that HEIs do not embed integrated thinking within the organization and that IR should be considered as a further step on the sustainability journey. Adams (2018) finds that although universities have the biggest impact of society and the largest beneficiaries of integrated thinking and IR, UK universities are not fully rising to the challenges as set by IIRC (2013). However, those UK HEIs who participate

within the advanced higher education integrated thinking and IR project spent valuable time discussing the meaning of value creation for HEIs and their stakeholders (Adams, 2018). In this context, the BUFDG report (2016) emphasises that HEIs, in particular, have an interesting story to tell their stakeholders about the importance of their role and the connections and relationships between all the factors that affect the ability of HEIs to create value over time.

Therefore, the consensus of the literature suggests that for HEIs in Scotland, Northern Ireland and Wales to produce integrated reporting, they should follow an integrated thinking approach. Our investigation of the disclosure on IR content elements will show the connectivity and interdependencies as a reflection of integrated thinking, leading to the provision of increased disclosure. This is because disclosure on the content elements (such as external environment, governance, risk and opportunities, performance, outlook, etc.) brings together information from a wide range of different departments in the organization.

3. Review of the literature

3.1 Signalling theory in higher education

Mahoney (2012) and Mahoney *et al*. (2013) argue that there are several theories addressing the association between voluntary disclosures and performance, which are generally consistent with either a voluntary disclosure perspective to which *signalling theory*[1] belongs, or theories grounded in a socio-political perspective to which *greenwashing*[2] belongs (e.g. Hassan and Guo, 2017). Signalling theory assumes that disclosure is costly, and companies will disclose only when the benefits outweigh the associated costs (e.g. Verrecchia, 2001). It deals with differences of information between stakeholders and the organizations and promotes the idea

[1] Signalling theory is "*...useful for describing behaviour when two parties (individuals or organizations) have access to different information. Typically, one party, the sender, must choose whether and how to communicate (or signal) that information, and the other party, the receiver, must choose how to interpret the signal (Connelly, et al., 2011, p.39)".*

[2] Greenwashing "involves selective disclosure of positive sustainability actions resulting in misleading and biased reporting" (*Mahoney et al*., 2013, p. 352). Greenwashing is a practice that is deceptively used to promote the perception that a company's policies or products are environmentally friendly, when arguably they are not (Lewis, 2016).

that appropriate communication can close the gap between the organisation and its stakeholders. In the context of higher education, signalling theory proposes there is asymmetry of information mostly in favour of universities (Connelly *et al.,* 2011; Taj, 2016; Zutshi *et al.,* 2018). This imbalance would ideally be the motivation for the university to publicly communicate and transmit the helpful information to relevant stakeholders. And, yet, this natural rebalancing does not always occur as expected (Veltri and Silvestri, 2015; Zutshi *et al.,* 2018). However, based on our discussion in the previous section, we would expect that if universities implement integrated thinking to signal to stakeholders how HEIs create value for society (Secundo *et al.,* 2016), this will be reflected as an increase in the level of disclosure on IR content elements and will enhance their accountability (Rinaldi *et al.,* 2018). Also, integrated thinking as a tool for connectivity and interdependence between different departments will eliminate the imbalance and clearly articulate the value creation in the HEI sector (Adams, 2018). This is because if managers are engaged in integrated thinking, HEIs can demonstrate interconnectivity between strategy, strategic objectives, risk and incentives, breaking down the barriers between departments and stimulating dialogue within different teams contributing to holistic corporate report (Stacchezzini *et al.,* 2019). This simply means an increase in the level of disclosure on IR content elements.

3.2 Integrated reporting

For the purpose of this study, prior pieces of literature are classified into three groups. The first group covers the IR framework, the second one covers IR in the public sector, and the third group covers IR in the higher education sector.

The first group of studies covers the IR framework and address its three components: fundamental concepts; guiding principles; and content elements IIRC (2013). Some researchers focus on the fundamental concepts of IR (Humphrey *et al.,* 2017; Adams, 2017; Oll and Rammerskirchen, 2018; Liu *et al.,* 2019). The findings of these studies reveal that the

integration of sustainability information and value creation reporting is highly influenced by the IR framework. In addition, while some studies are based on the guiding principles (Mio *et al.,* 2016; Ruiz-Lozano and Tirado-Valencia, 2016; Oll and Rammerskirchen, 2018), others are based on the content elements (Mass *et al.,* 2016; Pavlopoulos *et al.,* 2017). Even though the IR practice is still in the early stages, some prior researchers have taken a qualitative approach and explore the implications of IR based on semi-structured interviews (Wee *et al.,* 2016; Feng *et al.,* 2017; Trébuca *et al.,* 2017; Maroun, 2018; Stacchezzini *et al.,* 2019). In this context, Bananuka *et al.* (2019) explore the reason for slow IR adoption in Uganda as a developing country and the factors that need to be emphasized to ensure firms are embracing the practice of IR. The results reveal that because of scarce resources, culture and leadership, stakeholder`s demand, the regulatory requirement, effect of globalisation and the mindset, lack of awareness of IR, nature of business and size of organisation, IR adoption is slow in developing countries. Melloni *et al.* (2017) investigated the disclosure of conciseness, completeness, and balance in IR. The research findings indicate that firms are struggling to produce concise, complete and balanced reports. More interestingly, firms with lower financial performance tended to produce longer, more complex IR whereas firms with lower social performance disclosed less on the sustainability topic.

The second group of studies cover IR in the public sector. Cohen and Karatzimas (2015) provide a conceptual contribution to the debate about IR as the future form of corporate reporting in the Greek public sector. The research concludes with a recommendation that government entities publish information on IR regularly and that the provision of such information should be concise and comprehensive. The case study of Guthrie *et al*. (2017) explores the connection between IR, integrated thinking and the internal mechanism of change in the Italian public sector. Montecalovo *et al*. (2018) examine the influence of IR on the sustainability practice in the enterprises owned by the state in New Zealand. The results

indicate that the sustainability disclosure quality was steady during the study period. In a case study based at an Italian university hospital, Cavicchi *et al.* (2019) investigate IR mechanisms that affect the potential development of IR practice in the Italian health care sector. The findings indicate that there is limited implementation of IR in the health care sector and that IR framework adoption is only possible when the major stakeholders are involved in the decision-making process.

The third group of studies cover IR in higher education. Veltri and Silvestri (2015) conducted a pioneering study into The Free State University IR in South Africa in 2012. The research findings show that the university content elements did not follow in practice the intended meaning of the IIRC framework as content elements and guiding principles. More interestingly, the findings show that the content elements did not have an outward-looking orientation, nor were they interconnected, and furthermore, there was a lack of information on stakeholder relationships and value creation. Brusca *et al.* (2018) explore IR and sustainability reporting at the HEIs in the voluntary reporting context of an innovative Spanish university. This case study analyses the development of sustainability reporting and IR at the university and the results indicate that the report mainly focused on sustainability and social value, rather than connecting all capitals from the IR framework and that integrated thinking was not embedded within the organisation. Our study will contribute to the three groups of prior research as it covers IIRC content elements in HEIs as public sector organizations.

4. Development of hypotheses

4.1 Establishment of HEIs

The establishment of universities classifies UK universities into two main groups: universities established pre-1992 (old universities) and universities established post-1992 (new universities). Previous studies relating disclosure to the period of establishment of HEIs provide no conclusive results. One group of studies finds that pre-1992 HEIs disclose

significantly more financial and research information than their post-1992 counterparts, but there are no significant differences between pre- and post-1992 institutions regarding the overall disclosure level (Maringe, 2009; Lomas, 2006; Ntim *et al*., 2017). The other group suggests that post-1992 universities are more open towards improving the quality of teaching and learning, internationalisation and adoption of modern technology for teaching and communication. Asaad *et al*. (2013) find that post-1992 universities have a high volume of teaching income that includes income from international students. Lomas (2006) argues that post-1992 universities improve the quality of teaching and learning, including success in the adoption of a Virtual Learning Environment (VLE) approach.

Although post-1992 universities are increasing the disclosure of their activities and the gap between the two groups may be closing, they may still be in the process of realising the advantages of disclosing across the wide range of their activities, and furthermore, may not be able to devote as much time and resources as pre-1992 universities to assembling the content required to create this narrative. To the best of our knowledge, this is the first study to examine the impact of the period of establishment of HEIs on the disclosure level of integrated reporting in Scottish, Northern Irish and Welsh HEIs. Based on the above discussion, the present study investigates whether the period of establishment of the HEI (before or after 1992) has an effect on the level of disclosure of the integrated reporting content elements. This leads to the first hypothesis of the current study:

H1. Older established universities (pre-1992) are more likely to provide disclosure on IR content elements disclosure than newly established universities (post-1992).

4.2 IR adoption

Prior studies on IR adoption do not provide consistent results. While the study of Melloni *et al*. (2017) provide evidence that in practice, corporations are struggling to produce a concise,

complete and balanced report, the study of Ahmed Haji and Anifowose (2017) concludes that corporate disclosure increased after IR adoption. In addition, other studies criticise the adoption of IR. For example, the study of Gunarathe and Senaratne, (2017) found that IR is a transition from sustainability reporting rather than a transformation and conclude that corporations need more guidance in the process to achieve integrated thinking in practice. The study of Veltri and Silvestri (2015) also finds that the South African Free State University`s IR related content elements and guiding principles do not reflect the meaning and intentions of the IIRC Framework. However, BUFDG (2016) provide evidence that UK universities are beginning to prepare higher-quality integrated reports but that more practice is needed in critical analysis and creativity to draw out the narrative from the figures and tell their stories. Therefore, it is expected that IR adoption will exercise a positive influence on the level of IR content elements disclosure. Hence, the second hypothesis is formulated.

H2. There is a positive relationship between university adoption of IR and the level of disclosure on IR content elements.

4.3 League table performance

University ranking and its position in the league table has become important for public accountability (Berbegal-Mirabent and Ribeiro-Soriano, 2015; Gibbons *et al.,* 2015). These rankings supply information on the measurable dimension of service quality and encourage institutional transparency including stimulating a culture of quality assessment in education. Furthermore, Gibbons *et al*. (2015) have demonstrated that the National Student Survey has a statistically significant impact on student applications. Christie (2016) also provides evidence showing the significance of league tables in contributing to establishing a trustworthy status, employment measurement and comparisons with other stakeholders. The Guardian League Table (2017) indicators are for satisfaction with course, satisfaction with teaching, satisfaction with feedback, student allocation, student spending allocation and average entry tariff. This

research argues that information disclosure may be affected by league table ranking position and this leads to the third hypothesis:

H3. There is a positive relationship between university performance position ranking in league tables and the level of disclosure on IR content elements.

4.4 University governing board size

Gallego–Alvarez *et al*. (2011) examine the relationship between information disclosure and size, leverage, university profitability, governance board size, internationality of university, age of university and other explanatory variables within 70 Spanish universities. A content analysis method was used, and they concluded that board size is statistically insignificant and does not influence the university's information disclosure. This suggests that disclosure in universities is not influenced by similar parameters which are behind corporate disclosure in businesses.

Ntim *et al*. (2017) explore the influence of corporate governance towards the extent of voluntary disclosure. 130 UK HEI annual reports were analysed with the variables of governing board size; board meeting frequency; membership diversity; quality of the board audit committee and audit firm quality. The research used a multi-theoretical framework and descriptive analysis, including ordinary least squares regression models. The findings indicated that audit committee quality, governing board diversity, governor independence and the presence of governing committee do not influence HEI voluntary disclosures. This suggests that university corporate board size does not have any influence on voluntary disclosure. Therefore, the fourth hypothesis is as follows:

H4. There is no relationship between university governing board size and the level of disclosure on IR content elements.

5. Methodology

5.1 Data selection

Our population consists of 26 HEIs in Scotland, Northern Ireland and Wales. The list of HEIs was taken from the Complete University Guide (2017) and used to collect data for academic years 2013/14, 2014/15 and 2015/16 respectively. Thus, our evidence was obtained from 26 HEIs over 3 academic years (78 observations). This study covers data collected from the annual reports prepared by HEIs located in Scotland, Northern Ireland and Wales in comparison to prior studies. We collect various secondary data types associated with HEI sector-specific features and IR content elements disclosure. The control variables used for this study involved the selection of datafinancial variables collected from HEI websites, HEI annual reports, and other publicly available information.

5.2. Research variables

Integrated Reporting disclosure index (dependent variable). We follow prior literature on HEIs that used content analysis to examine the level of disclosures (Gallego–Alvarez *et al*., 2011) and in the UK (Ayoubi and Massoud, 2007; Jiang and Carpenter, 2013; and Low *et al*., 2015). The current study follows this practice to analyse voluntary disclosure in the UK HEI sector.

To construct the disclosure index, we followed the IR framework provided by the IIRC (2013) and recently adopted by the BUFDG (2016) and focused only on the integrated reporting content elements. According to the IIRC, an integrated report includes eight content elements which are as follows: organisational overview and external environment, governance, business model, risk and opportunities, strategy and resource allocation, performance, outlook and basis of preparation and presentation (IIRC, 2013). A pilot study was conducted and examined six HEIs including their annual reports. Three researchers from three different

universities independently reviewed disclosure scores, with any scoring differences discussed and reconciled (See Appendix 1 for the disclosure index).

This research adopted the weighted scoring method for disclosure indices and this assigns a weight to each item to consider the variation in the importance of each type of information (Cheung *et al*., 2010). This is structured as follows: no disclosure = 0, descriptive disclosure without any link to strategy, governance, performance and prospect=1, descriptive disclosure and link with all strategy, governance, performance and prospect compare with historic position=2, descriptive disclosure linked with all strategy, governance, performance and prospect compare with historic, present and future position=3. The total disclosure score of IR content elements disclosed in HEI annual reports integrated reporting score is the dependent variable.

Independent variables. The researchers also collected data on (1) HEI sector-specific features comprises time of establishment of the HEI (*ESTB*) (Ntim *et al.,* 2017; Gallego–Alvarez, *et al.,* 2011); (2) IR framework adoption (*IRFA*) (Gunarathe and Senarathe, 2017; Solomon and Maroun, 2012); (3) league table position ranking (*LTR*) (Christie, 2016); and (4) the number of members in the governing board (*BSIZE*) (Ntim *et al*., 2017; Gallego–Alvarez, *et al.,* 2011).

Control variables. To reduce the potential of omitted variable bias (Aburaya, 2012), the following control variables have been also collected: (1) council funding (*FUND*); (2) growth in total income (*GWTH*); (3) HEI liquidity (*LIQD*); (4) HEI total assets (*SIZE*); and (5) total endowment assets (*TEA*). Due to the cross-sectional nature of the data collected, the empirical analysis commences with descriptive statistics, correlation and regression analysis (see Table 1 for the measurement of the research variables). Table 1 classifies the research

variables used in *H1 – H4* for three years 2013/14, 2014/15, 2015/16 and explains the variables measurement process.

Insert Table 1 here

5.3 Data analysis and model specification

Data analysis proceeds in five steps. First, descriptive statistics of all study variables are calculated, including mean, median, standard deviation, min, max, frequencies and quartile. Second, the total integrated reporting content elements' disclosure score for research data is offered. Third, t-test and chi-square tests are employed to discover relationships between integrated reporting content elements and establishments of higher education institutions. Fourth, Spearman correlation coefficients are calculated between study variables. Lastly, hypothesis testing is conducted via ordinary least squares (OLS) regression to estimate the influence of explanatory variables on providing disclosure on the content elements of the integrated reporting. Generally, OLS regression is well suited for testing our hypotheses and in line with previous studies (Alshbili *et al.,* 2019; Elamer *et al.,* 2017, 2018, 2019; Elmagrhi *et al.,* 2019). The regression model is specified as:

$$\text{TOTAL} = \beta_0 + \beta_1 ESTB + \beta_2 IRFA + \beta_3 LTR + \beta_4 SIZE + \beta_5 BSIZE + \beta_6 GWTH + \beta_7 FUND + \beta_8 LIQD + \beta_9 TEA + \varepsilon \quad (1)$$

Where *TOTAL* is total IR content elements disclosure score; *ESTB* refers to establishment of HEI (before or after 1992); *IRFA* refers to the IR framework adoption; *LTR* refers to performance position ranking in the league table; *BSIZE* refers to number of members in HEI governing board and control variables of total assets depicted as *SIZE*; percentage of current periods total income minus previous periods total income to previous periods total income is given as *GWTH*; percentage of total annual council funding income to total annual income is referred to as *FUND*; current assets divided by current liabilities is *LIQD*; and the percentage

of total annual endowment assets to total annual assets is *TEA*. Also, the statistical programs SPSS and Stata are used in analysing our data.

6. Results and Discussion

6.1 Descriptive statistics

Table 2 presents the summary of descriptive statistics for the dependent variables, independent variables and control variables. It also presents the statistics of the eight themes of IR content elements. Evaluation of the summary's descriptive statistics indicates rather interesting findings. There was a large degree of variability in the summary of IR content elements disclosure in the HEI sector which aligns with the findings of prior studies (Gallego–Alvarez *et al*., 2011; Ntim *et al*., 2017). The scores range from a minimum of 2 to a maximum of 18 in some themes and ranges from 26 to a max of 105/168 for the total IR content elements scores and widespread distribution is depicted in Table 2. Total disclosure relating to the league table ranking position (*LTR*) intervals range from a minimum of 0 to maximum of 125 and total disclosure related to HEI governing board size (*BSIZE*) reveals from a minimum of 15 to maximum of 38.

Insert Table 2 here

6.2 Analysis of integrated reporting content elements disclosure index

We carried out two different types of analysis to present the integrated reporting content elements disclosure index. First, we presented the total scores over the selected three years of the study (2013/14, 2014/15, and 2015/16) for the 26 universities in our data (see Table 3). The results show that there is a large degree of variability in total scores achieved by our data. Scores range from a minimum score of 26 (achieved by University No. 16) and a maximum score of 89 (achieved by University No.13) in 2013/14. There is a slight difference in this variability in 2014/15 with scores ranges from a minimum score of 32 (achieved by the

University No. 26) and a maximum score of 99 (achieved by the University No. 9). In 2015/16, scores range from a minimum score of 43 (achieved by the University No. 26) and a maximum score of 105 (achieved by the University No. 9).

The results also show that there is an increase in the level of disclosure on integrated reporting content elements provided by our d data over the years. We noticed that some universities have dramatically improved their level of disclosure on integrated reporting content elements between 2013/14-2015/16 as some universities achieved over 188% increase in the level of disclosure. For example, University No. 2 scored 34 in 2013/14 and managed to achieve 98 in 2015/16 (188.24% increase). We interpret the increase of the level of disclosure on IR content elements as a reflection of implementing an integrated thinking approach. This is because content elements themes (governance, risk & opportunities, performance, outlook, etc.) bring together information from different departments and this shows the connectivity and interdependencies as a reflection of integrated thinking. This can also break down the barriers between departments, stimulating dialogue within different teams as they prepare the integrated report (Stacchezzini *et al.,* 2019).

Insert Table 3 here

Secondly, we ran t-test and chi-square tests to investigate if there are any differences in the level of disclosure of integrated reporting content elements and the date of establishment (*ESTB*) of the higher education institutions (pre and post-1992). Table 4 presents the totals of the eight themes (Organisational Overview and External Environment (*OEE*); Governance (*GVN*); Value Creation Model (*VCM*); Risk and Opportunity (*RO*); Strategy and Resource Allocation (*SRA*); Performance (*PM*); (7) Outlooks (*OLK)* and Basis of Preparation and Presentation (*BPP*)). This because we felt that the total of each theme is enough to explain the results. However, a full analysis of t-test and chi-square tests of all the disclosure items of our index is available upon request. These findings indicate that, in general, pre-1992 HEIs provide

more disclosure on integrated reporting content elements. Both t-test and chi-square tests identify significant differences (t-test p = .005 and chi-square p = .006) between pre and post 1992 institutions with regard to 7 items. OEE (t-test p = .002 and chi-square p = .002). VCM (t-test p = .003 and chi-square p = .004). RO (t-test p = .029 and chi-square p = .030). SRA (t-test p = .085 and chi-square p = .085). PM (t-test p = .010 and chi-square p = .011). OLK (t-test p = .000 and chi-square p = .000). BPP (t-test p = .011 and chi-square p = .011). Collectively, the above findings indicate that pre-1992 HEIs provide higher levels of disclosure than their post-1992 counterparts. This supports H1*: Older established universities (pre-1992) are more likely to provide disclosure on IR content elements disclosure than newly established universities (post-1992).*

Insert Table 4 around here

6.*3 Correlation matrix*

Table 5 presents the correlation matrix for the variables used in our regression analysis to test for multicollinearity and we also report the Spearman's nonparametric coefficient. The results show that there is a positive but not significant relation between Total IR and HEI governing board size *BSIZE* (0.124) and a significant negative relation with the league table ranking position (-0.046). In terms of the control variables, the results show no relation between growth *GWTH* (0.046), funding *FUND* (0.013) and total endowment assets *TEA* (-0.018). However, there is a positive significant relationship between total IR and HEI total assets *SIZE* (0.284) but a negative relation between total IR and liquidity *LIQD* (-0.205).

Insert Table 5 around here

6.4 Multivariate Results

Table 6 presents the regression results for the relation between Total IR and all research variables.

Establishment of HEI and Total IR disclosure. Model 1 of Table 6 shows that the establishment of HEI is positively and significantly associated with Total IR disclosure. This supports the argument that the HEIs established before 1992 have more IR content elements disclosure compared with the HEI established after 1992. Maringe (2009) found that due to increasing competition and change in HEI funding since 2006, the pre–1992 universities in the UK changed the content of corporate reporting to attract talented people from around the World. Ntim *et al.* (2017) found that the HEIs established before 1992 disclose significantly more financial and research information compared with the HEIs established after 1992. Our results are in line with the finding of Hassan *et al.* (2019) that pre-1992 universities employ integrated reporting and thinking to gain stakeholders' trust. Therefore, the above results suggest that there is strong support for H1: (*Older established universities (pre-1992) are more likely to provide disclosure on IR content elements disclosure than newly established universities (post-1992)).* Our interpretation for this result is that there is evidence that the pre-1992 HEI departments and units are more active than post-1992 universities in connecting and collaborating, reflecting integrated thinking, and describing the impact of their behaviour on their stakeholders via integrated reporting, supporting a signalling theory interpretation (Del Baldo, 2017).

Integrated reporting framework adoption and Total IR disclosure framework.

Model 1 of Table 6 also displays the regression results for the relation between the IR framework adoption (*IRFA*) and Total IR disclosure. Our results show that there is a positive relationship between integrated reporting framework adoption (*IRFA*) and Total IR disclosure (t = 3.12). This result is in line with numerous prior studies which find a positive relation between integrated reporting framework adoption and Total IR disclosure (Melloni *et al*., 2017; Pavlopoulos *et al*., 2017; Hassan *et al*., 2019). Additionally, Feng *et al*., (2017) suggested that the integrated reporting framework is significantly well developed to drive organisational

reflection or reporting and attract wider corporate engagement. This provides support for H2: *(There is a positive relation between university adoption of IR and the level of disclosure on IR content elements).* Our interpretation for this result is that there is evidence that those HEIs that adopt IR are implementing integrated thinking inside the organisation to report on the impact of their behaviour on their stakeholders via integrated reporting (Katsikas *et al*., 2016). t Our results also provide an indication that universities are able to improve their IR Content elements disclosure and "integrated thinking" and signalling strategy even without adopting the IR Framework. to signal to stakeholders how HEIs create value for society (Secundo *et al.,* 2016; Zutshi *et al*., 2018; Rinaldi *et al.,* 2018).

Insert Table 6 around here

University ranking and total IR disclosure framework

Model 1 of Table 6 shows that there is no significant relation between university performance position ranking in the league table (*LTR*) and Total IR disclosure (t = -0.16). Our results differ with some prior studies, which find that the higher the position ranking in league tables, the higher the disclosure for performance, student satisfaction and graduate`s employment rate. The reason for this could be that we have not used the full data of UK universities, and so repeating this test with the full data may give a different result. Also, there is a debate around the issue of university rankings, particularly for post-1992 universities. Maringe (2009) argues that for lower-ranked universities, the ranking of specific subject/ school and other qualities can be a competitive advantage and can account for their scope internationally. The result for this data of universities implies that there is no relation between university ranking and level of disclosure on IR. Thus, we reject H3: (*There is a positive relation between university performance position ranking in league tables and the level of disclosure on IR content elements).* Our results are in line with the findings of the prior study of Hassan *et al.* (2019)

that investigated UK HEIs and we support their recommendation that the British Universities Finance Directors Group (BUFDG), may consider developing voluntary IR guidance in a clear, consistent, concise and comparable format. This might allow the connections between departments via integrated thinking to provide a full reflection to stakeholders-signalling theory-.

HEI governing board size and Total IR disclosure framework

The findings of Models 1 of Table 6 show that there is a positive relationship between the number of members of the HEI`s governing board (*BSIZE*) and Total IR disclosure, however, this relationship is not significant statistically ($t = 0.71$). This result is in line with prior studies which found no relation between HEI governing board size and Total IR disclosure (Ntim *et al*., 2017; Gallego–Alvarez *et al*., 2011). This provides support for H4: (*There is no relation between university governing board size and the level of disclosure on IR content elements).* Our results are in line with the prior study of Hassan *et al.* (2019) that investigated IR content elements in UK HEIs. Our interpretation for the above result is that it might be the board size as one of corporate governance (CG) variables is not enough to measure this relationship and future research can look at more comprehensive CG variables such as gender, duality to be able to judge and also the small size of the population might affect our results.

Additional analyses

In this section, we carry out a set of additional analyses that aim at determining the robustness of the main results from the previous section. First, we use random-effects regression analysis (Alnabsha *et al*., 2018; Elamer and Benyazid, 2018; Ntim *et al.,* 2017) to investigate whether HEI specific features influence Integrated Reporting (IR) disclosure. Omitted variables are a probable source of endogeneity in our study context. HEIs with certain features could choose to disclose more information about integrated reporting. Reverse causality is another potential

source of endogeneity. In that occasion, the OLS regression in Model 1 of Table 6 would be biased. To deal with endogeneity, we use a random-effects regression as follows:

$$TOTAL = \beta_0 + \beta_1 ESTB + \beta_2 IRFA + \beta_3 LTR + \beta_4 BSIZE + \beta_5 SIZE + \beta_6 GWTH + \beta_7 FUND + \beta_8 LIQD + \beta_9 TEA + \delta_{it} + \varepsilon_{it} \quad (2)$$

where everything else remains unaffected as stated in equation (2) and Table 1. δ is the University-year specific effects, and ε is the error term. The results are reported in Model 2 of Table 6. These results are highly similar to those represented in Model 1 of Table 6, suggesting that our results seem to be robust to the potential endogeneities that may be affected by omitted variable bias or/and reverse causality.

Second, we further address potential endogeneities that may be affected by omitted variable bias by estimating two-stage least square (Elamer *et al.,* 2018). We use the instrumented variables of the *LTR* and *BSIZE* as and re-run equation (2) as follows:

$$TOTAL = \beta_0 + \beta_1 EST + \beta_2 IRFA + \hat{\beta}_3 LTR + \hat{\beta}_4 BSIZE + \beta_5 SIZE + \beta_6 GWTH + \beta_7 FUND + \beta_8 LIQD + \beta_9 TEA + \delta_{it} + \varepsilon_{it} \quad (3)$$

where everything else remains unaffected as stated in equation (2) except that we use the instrumented part of the *LTR* and *BSIZE*. The results are reported in Model 3 of Table 6. These results are also similar to those presented in Model 1 of Table 6, indicating that our findings appear to be robust to potential endogeneity that may be caused by omitted variables bias.

Third, to ascertain the assumption underlying our OLS regression model that all the unobserved heterogeneities may affect the correlation between the governance variables and the error term is invariable over time, we calculate a lagged estimator as proposed by Ntim *et al*. (2017). The findings are reported in Model 4 of Table 6. Again, we find the results indicate a positive and statistically significant relationship among the *ESTB*, *IRFA* and *TOTAL* indices. These results

are also largely similar to those reported in Model 1 of Table 6, and thereby implying that our results are not strongly affected by potential endogeneity problems that may be caused by simultaneity.

7. Conclusions

Despite the wide range and significant impact of the activities undertaken at universities, they have tended to lag behind the rest of the corporate world when it comes to identifying and communicating their activities and impacts to the diverse groups of stakeholders that are involved in their existence. To bridge the gap between stakeholder expectations and organisational communication style regarding transparency and conciseness the IR framework was developed (IIRC, 2013). The main motivation for this study is that the unique nature of HEI challenges makes the connection and the interdependence between its departments, through integrated thinking, crucial to provide relevant information to stakeholders on value creation. We conceptualize integrated thinking as an internal process that organizations can follow to increase the level of disclosure on integrated reporting that will be used as a communication tool with stakeholders. In doing so, our paper contributes to the link between integrated reporting and integrated thinking research (Katsikas *et al*., 2016; Adams, 2017; Rinaldi *et al*., 2018) by investigating whether the disclosure of IR content elements is a reflection of implementing integrated thinking approach in HEIs (Higgins *et al.,* 2019; Stacchezzini *et al*., 2019; Adams, 2018). Our paper also introduces signalling theory to describe the strategic thinking of HEIs that communication via integrated thinking can close the gap between the organization and its stakeholders and enhance its credibility (Zutshi *et al.,* 2018; Rinaldi *et al.,* 2018). This might enable these HEIs to live their story rather merely telling it (CIMA, 2017). Our results support the idea that integrated thinking is contributing to enhance the level of disclosure on IR content elements in HEIs. Our results are in line with the prior studies that IIRC's success is due to its ability to take advantage of a favourable momentum

when corporate reporting was already beginning to become more integrated in practice before issuing the IR Framework (Adams et al., 2016; La Torre et al., 2019). Our results when measuring the relationship between IR and IR adoption indicated that universities are able to improve their disclosure and "integrated thinking" and signalling strategy even without adopting the IR Framework

Using recent data from three financial periods for 26 HEIs in Scotland, Northern Ireland and Wales, the findings indicate that there are disparities in IR content elements disclosure. The overall score is 29.09 percent. Analysis over the three financial periods 2013/14, 2014/15 and 2015/16 with independent variables and control variables produced a score of (53.53%) whereas this is lower (48.07%) with all independent variables but without the inclusion of the control variables. This appears to be very low in comparison with other research results on voluntary disclosure in HEI sector; 44.02% from 130 UK HEI (Ntim *et al*., 2017); and 56.9% from 78 Spanish HEIs (Gallego–Alvarez *et al*., 2011). Akin to the business organisational sector, the lack of IR content element disclosure could be due to the HEI lack of experts and/or lack of resources to produce an integrated report appropriately. This study focussed on HEI annual report disclosure which does not consider the possibility that HEIs perhaps rely more on other forms of public communication (website, press release, social media). From a methodological point of view, the disclosure index is constructed based on the IR framework produced by the IIRC, (2013). However, the IR framework is in a period of infancy and still requires a lot of dialogue to support implementation in the HEI sector (Veltri and Silvestri, 2015). In the UK HEI sector, professional bodies are actively engaged to support IR framework adoption and integrated report preparation (BUFDG, 2016, 2017).

The findings have important policy, regulatory, managerial and international implications. First, the results will be of interest to policymakers and regulators to assess the benefits of voluntary implementation of IR at HEIs in order to provide evidence for the

possibility of the mandatory implementation of IIRC guidelines. Second, our results will be of interest to managers at universities that wish to follow these new trends. The findings can serve as a learning process for institutions interested in implementing integrated reporting. Third, our results are important to other stakeholders to further encourage universities, through their institutionalised requirements, to explicitly address integrated reporting issues in their reporting as this will increase their impact.

This study has some limitations. The use of the weighted index may need more simplification and may be affected by judgement in the selection of content, however, it has been used before (Cheung *et al*, 2010). Future research can focus on using an unweighted index and compare the results with our study. The study is based on a data of HEIs from Scotland, Northern Ireland and Wales and the findings could be more robust by including all UK HEI or HEI in other countries. Future research can extend this to focus on all UK HEIs. The study is based on IR content elements only and could be extended to include the fundamental concept and basic principles of the IR framework. Future research can look at other aspects of the IR framework such as reporting guidelines and can also include HEI core activities (such as teaching and learning, research and internationalisation) which have been omitted from this study. These factors should be examined in more depth by future researchers both nationally and internationally which could extend the research findings. The study focused on some regions (Scotland, Northern Ireland and Wales) in one country (UK). Future research should extend our work to be examined internationally and it might be more interesting to compare between voluntary disclosures of IR to other HEIs in other countries which IR is mandatory, such as South Africa.

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Tables

Table 1: Summary of variables and measurement

Variables	Acronym	Definitions and coding.
Dependent Variable: Total IR content elements' Disclosure Score	TOTAL	Total IR Content Elements Disclosure Score. Where, TOTAL - is the IR content elements disclosure score containing 56 items based on 8 main themes (see appendix 1 for more details), including: (1) Organisational Overview and External Environment (OEE) including 7 items; (2) Governance (GVN) containing 7 items; (3) Value Creation Model (VCM) covering 7 items; (4) Risk and Opportunity (RO) entailing 7 items; (5) Strategy and Resource Allocation (SRA) including 7 items; (6) Performance (PM) containing 7 items; (7) Outlooks (OLK) covering 7 items and (8) Basis of Preparation and Presentation (BPP) covering 7 items. All (8 themes X 7 items) 56 items have a score threshold of 0 to 3, resulting in a total potential score of (56X3) 168. Where no disclosure = 0, descriptive disclosure without any link to strategy, governance, performance and prospect = 1, descriptive disclosure and link with all strategy, governance, performance and prospect compare with historic position = 2, descriptive disclosure linked with all strategy, governance, performance and prospect compare with historic, present and future position = 3.
Independent Variables related to Higher Education sector characteristics	ESTB IRFA LTR BSIZE	Establishment of HEI: 1, If an HEI is established before 1992, 0 otherwise; Integrated Reporting Framework Adoption: 1, If an HEI adopted IR Framework, 0 otherwise; League Table Position Ranking: Measured by performance Position Ranking in Complete University Guide League Table Number of members in HEI governing board.
Control Variables	SIZE GWTH FUND LIQD TEA	Size measured by Total Assets Growth measured by the Percentage of current year's total income minus previous year's total income to previous year's total income Funding measured by Percentage of total annual council funding income to total annual income Liquidity measured by Current Assets divided by Current Liabilities Total endowment measured by the Percentage of total annual endowment assets to total annual assets.

Table 2: Descriptive statistics of study variables

Variable	Median	Mean	Range	Std. Dev.	Min	Max	25%	50%	75%
Dependent variable									
Total IR Score	57.00	-	79.00	-	26.00	105.00	44.00	57.00	71.00
Theme (1) OEE	10.00	-	11.00	-	5.00	16.00	8.00	10.00	12.00
Theme (2) GVN	8.00	-	11.00	-	4.00	15.00	6.75	8.00	10.00
Theme (3) VCM	7.00	-	14.00	-	2.00	16.00	4.75	7.00	10.00
Theme (4) RO	6.00	-	13.00	-	2.00	15.00	4.00	6.00	8.25
Theme (5) SRA	9.00	-	16.00	-	2.00	18.00	6.00	9.00	12.00
Theme (6) PM	8.00	-	14.00	-	3.00	17.00	6.00	8.00	10.00
Theme (7) OLK	6.00	-	9.00	-	2.00	11.00	4.00	6.00	8.00
Theme (8) BPP	3.00	-	4.00	-	2.00	6.00	3.00	3.00	5.00
Independent variables									
LTR	47.50	54.97	125.00	36.22	0.00	125.00	30.00	47.50	86.25
BSIZE	27.00	28.15	23.00	4.72	15.00	38.00	25.00	27.00	32.00
Control variables									
FUND	32.61	37.55	335.79	39.32	2.74	338.53	18.04	32.61	45.97
GWTH	4.18	4.79	93.71	10.34	-13.12	80.59	0.92	4.18	7.34
LIQD	1.66	1.78	4.63	0.92	0.28	4.91	1.07	1.66	2.07
SIZE	27209 7.50	42866 8.94	26895 37.00	498911 .62	1770 2.00	270723 9.00	17437 2.25	27209 7.50	51274 8.00
TEA	0.77	1.00	6.68	0.97	0.01	6.69	0.35	0.77	1.30
Variable	**Yes (1)**	**No (0)**							
ESTB	45	33							
IRFA	5	73							

Table 3: Total integrated reporting content elements' disclosure score

	Total IR content elements' disclosure score			
Universities Sample	2013/14	2014/15	2015/16	% increase***
1	34	50	72	111.76%
2	34	61	98	188.24%
3	35	38	47	34.29%
4	33	44	53	60.61%
5	34	47	54	58.82%
6	36	48	57	58.33%
7	55	55	66	20.00%
8	43	58	70	62.79%
9	83	99**	105**	26.51%
10	44	55	79	79.55%
11	43	52	66	53.49%
12	51	52	63	23.53%
13	89**	96	98	10.11%
14	40	47	57	42.50%
15	66	71	80	21.21%
16	26*	75	75	188.46%
17	50	61	70	40.00%
18	38	42	47	23.68%
19	44	57	71	61.36%
20	49	65	76	55.10%
21	68	76	94	38.24%
22	58	70	79	36.21%
23	68	80	80	17.65%
24	50	57	65	30.00%
25	38	49	67	76.32%
26	32	32*	43*	34.38%

* this refers to the university with the lowest score each year. ** this refers to those universities with the highest score each year, *** % of change is calculated as follows (the difference between the score in 2015/16 and the score in 2013/14/the score in 2013/14).

Table 4: Relationship between integrated reporting disclosure index and establishment of higher education institutions

	Linking Disclosure items' themes to Establishment of HEI (EST)							
	Pre-1992 (15)		Post-1992 (11)		T. test		Chi Square test	
	Mean	St	Mean	St	t. test	p-value	Chi-square	p-value
Integrated Reporting Content Elements (disclosure index components)								
(1) Organisational Overview and External Environment (OEE)	9.03	2.311	10.80	2.418	-3.253	.002***	0.14	0.002***
(2) Governance (GVN)	8.06	1.983	8.18	2.319	-.234	.816	0.511	.814
(3) Value Creation Model -Business Model (VCM)	5.91	2.708	8.16	3.567	-3.031	.003***	.263	.004***
(4) Risk and Opportunity (RO)	5.39	2.680	7.11	3.773	-2.232	.029**	.061	.030**
(5) Strategy and Resource Allocation (SRA)	8.24	3.419	9.62	3.473	1.745	.085**	.126	.085**
(6) Performance (PM)	7.48	2.717	9.18	2.871	-2.632	.010**	.095	.011**
(7) Outlook (OLK)	4.79	1.949	7.07	2.349	-4.541	.000***	.006	.000***
(8) Basis of Preparation and Presentation (BPP)	3.45	1.092	4.22	1.396	-2.623	.011**	.018	.011**
Total Integrated Reporting (IR) Content elements score	52.36	14.205	64.04	19.575	-2.881	.005***	.541	.006***

Note. Significance levels: $p < .10$. *$p < .05$. **$p < .01$. ***.

Table 5: Correlation matrix for research variables

	Total	LTR	BSIZE	FUND	GWTH	LIQD	SIZE	TEA
Total	1.00							
LTR	-0.046	1.00						
BSIZE	0.124	-0.034	1.00					
FUND	0.013	0.044	-0.186	1.00				
GWTH	0.046	-0.400**	-0.060	0.100	1.00			
LIQD	-0.205	-0.031	-0.134	-0.103	-0.083	1.00		
SIZE	0.284**	-0.337**	0.158	-0.296**	0.14	0.189	1.00	
TEA	-0.018	-0.158	-0.022	0.216	0.171	0.165	0.081	1.00

Note. The above table contains Spearman's nonparametric correlation coefficients, Significance levels: $p<.05$*. $p<.01$**. Variables are defined as follows: Total IR disclosure (*TOTAL*), Establishment of HEI (*ESTB*), Integrated reporting framework adoption (*IRFA*), League table position ranking (*LTR*), Number of members in HEI governing board (*BSIZE*), Funding (*FUND*), Growth (*GWTH*), Liquidity (*LIQD*), Total assets (*SIZE*), Total endowment (*TEA*).

Table 6: Influence of HEI specific characteristics on IR disclosure

Variables	(1)	(2)	(3)	(4)
Panel A: Independent variables				
ESTB	10.967***	7.027	10.210**	10.691**
	(0.008)	(0.167)	(0.025)	(0.023)
IRFA	23.146***	14.384	20.506**	29.339***
	(0.005)	(0.147)	(0.021)	(0.004)
LTR	-0.008	0.029	0.014	0.050
	(0.497)	(0.334)	(0.407)	(0.2120)
BSZE	0.252	0.388	0.290	0.548
	(0.403)	(0.234)	(0.255)	(0.133)
Panel B: Control variables				
FUND	0.041	0.029	0.051	0.025
	(0.484)	(0.277)	(0.167)	(0.287)
GWTH	0.097	-0.066	0.002	0.093
	(0.462)	(0.352)	(0.496)	(0.307)
LIQD	-3.705**	-2.603	-3.306	-2.731
	(0.002)	(0.154)	(0.162)	(0.152)
SIZE	0.000	0.000*	0.000	-0.000
	(0.500)	(0.038)	(0.195)	(0.492)
TEA	-1.919	-4.032**	-3.506*	2.756
	(0.041)	(0.027)	(0.060)	(0.119)
_cons	38.271***	42.977**	46.888***	44.455**
	(0.000)	(0.016)	(0.006)	(0.012)
Years	Included	Included	Included	Included
F-value (χ 2)	6.98***	20.89**	3.37***	4.08***
N	78	78	78	52
R-sq	0.54	0.28	0.31	0.50
adj. R-sq	0.46		0.22	0.38

Notes: The above table represents regression coefficients and P value in parentheses. Significance levels are * p<0.10, ** p<0.05, *** p<0.01. The Variables are defined as follows. Total IR disclosure (*TOTAL*), Establishment of HEI (*ESTB*), Integrated reporting framework adoption (*IRFA*), League table position ranking (*LTR*), Number of members in HEI governing board (*BSIZE*), Funding (*FUND*), Growth (*GWTH*), Liquidity (*LIQD*), Total assets (*SIZE*), Total endowment (*TEA*).

Appendix 1: Integrated Reporting Content Disclosure Index*

		0	1	2	3**
	Organisational Overview and External Environment (OEE)				
OEE1	Vison and Mission (VM)				
OEE2	Operating structure, Principle Activates and Market Position				
OEE3	Competitive environment and institution`s position(CEP)				
OEE4	Key quantitative information(KQI)				
OEE5	Commercial, social, technical, environment and political environment(STPE)				
OEE6	Revenue and change on it (RC)				
OEE7	External environment and its impact on value creation(EEVC)				
	Governance (GVN)				
GVN1	Leadership structure, diversity and regularity requirement(LDR)				
GVN2	Different element and interaction (DEI)				
GVN3	Executive and non-executives` role and responsibilities(ENR)				
GVN4	Strategic decision-making process(SDM)				
GVN5	Monitoring approach of strategic direction (MASD)				
GVN6	Risk identification, monitoring and mitigation(RIMM)				
GVN7	Directors remuneration determination process(DRD)				
	Value Creation Model -Business Model (VCM)				
VCM1	Main activities, strategic purpose achievement and value creation (APVA)				
VCM2	Different capitals utilization to complete main activities (CUA)				
VCM3	Main source of income (IS)				
VCM4	connection of KPIs and VCM)				
VCM5	Social and environmental impact of institution`s activities(SEI)				
VCM6	Student and staff satisfaction and student employability after graduation(SES)				
VCM7	Organisational change adoption and staff training and development (OCSD)				
	Risk and Opportunity (RO)				
RO1	Identifying significant Risk and Opportunity (IRO)				
RO2	Set of significant RO and net risk(SRNR)				
RO3	Risk managing process(RMP)				
RO4	Significant opportunity for value creation(SOVC)				
RO5	Opportunity seeking procedure and utilization for institution`s benefit(OSPB)				
RO6	Risk monitoring, mitigate and reporting system(RMMR)				
RO7	Disclosure of source of risk, opportunity and institutional affordability towards those(SRIO)				
	Strategy and Resource Allocation (SRA)				
SRA1	Short, medium and long-term objectives(SMLS)				

SRA2	Current and planned institutional strategies(CPS)				
SRA3	Resource allocation plans to implement strategy(RAIS)				
SRA4	Financial sustainability for short, medium and long term (FS)				
SRA5	Performance measurement for short, medium and long term(PM)				
SRA6	Sector wise institutional differentiation and reflection in strategy(IDRS)				
SRA7	Intellectual capital utilization for revenue maximization(ICRM)				
	Performance (PM)				
PM1	Strategic objectives for the period and its achievement(SIA)				
PM2	Balance and complete view of performance(BCP)				
PM3	Institutional performance towards strategic, financial & environmental issue(IPEI)				
PM4	Institutional performance towards all resources of institution based on(IPRB)				
PM5	Relationship between key stakeholders and respond towards their legitimate needs(SHR)				
PM6	Linkage with past, current and future outlook performance(PCFP)				
PM7	Carbon emission and sustainability activities and its financial impact(CESA)				
	Outlook (OLK)				
OLK1	Institutional expected external environment (IEEE)				
OLK2	External environments` impact for all resources (EEIR)				
OLK3	Respond towards critical challenge and uncertainties (RTCCU)				
OLK4	Institution`s strengths, weakness and market position to tackle external environment (SWMP)				
OLK5	Legal and regularity requirement that institution need to comply (LRIC)				
OLK6	Tackling challenge and uncertainties for short, medium and long term(TCU)				
OLK7	Interrelationship between institution`s objectives, external source and any forecast or assumption if any (IOEA)				
	Basis of Preparation and Presentation (BPP)				
BPP1	Content of report decision process and the individuals involved on this(RCPI)				
BPP2	Disclose the individuals involved in preparation and review the report (RPR)				
BPP3	Materiality identification and measure framework (MIMF)				
BPP4	Any uncertainty for data used for report preparation (DUC)				
BPP5	Material matter identification process (MIP)				
BPP6	Materiality identification, measurement and prioritization (MIMP)				
BPP7	How institutions` focus on value creation form material matter (IFM)				

*This disclosure index is adapted from the IIRC report (2013).

**No disclosure = 0, Descriptive disclosure without any link to strategy, governance, performance and prospect = 1, Descriptive disclosure and link with all strategy, governance, performance and prospect compare with historic position = 2, Descriptive disclosure linked with all strategy, governance, performance and prospect compare with historic, present and future position = 3