

Exploring the quality of corporate environmental reporting: Surveying Preparers' and Users' Perceptions

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Abstract

Purpose – This paper provides a multidimensional model for assessing the quality of corporate environmental reporting (CER) incorporating both preparer- and user-based views.

Design/methodology/approach – As opposed to frequently used researcher-chosen proxies, the authors used an online questionnaire asking preparers and users how they assess the quality of a company's environmental report.

Findings – The analysis of the responses of 177 users and 86 preparers show that quantity was not perceived as the most significant element in determining quality. Besides quantity, the respondents also perceived information types, measures used, themes disclosed, adopting reporting guidelines, inclusion of assurance statement and the use of visual tools as significant dimensions/features of reporting quality.

Research limitations – The online questionnaire has some limitations, especially in terms of researcher being absent to clarify meanings and, hence, possibilities that respondents may misinterpret the questionnaire elements.

Practical implications – Considering that robust, reliable measurement of reporting quality is difficult, preparers, standard setters, and policy makers need multidimensional quality models that incorporate both users' perceptions of quality and preparers' pragmatic understanding of the quality delivery process. These will make the preparers informed of whether their disclosure may be falling short of users' expectations.

Originality/value – Amid, increasing complexity of CER, the research contributes to the growing body of literature on assessing the quality of CER by developing a less subjective, multidimensional, preparer-user-based quality model. This innovative quality model goes beyond the traditional quality models, subjective author-based quality measures. Focusing on the three dimensions of reporting quality- content, credibility and communication- it also offers a high level resolution of meaning of CER quality.

Keywords – Environmental reporting, reporting quality, content analysis, disclosure index, multidimensional quality model.

Paper type – Research paper.

1.0. Introduction

There is an emerging consciousness that sustainability matters and that the corporations should take an active role in addressing sustainability issues (Bebbington, 2017; Deegan 2017; Gray, 2010). It has become common for companies to portray, through financial and non-financial reporting, an image of actively pursuing a positive social and environmental agenda. These new dimensions of performance reporting, often referred to as “corporate social responsibility reporting” or similar phrases, including integrated reporting, are attempts to satisfy the information demands of a broad range of stakeholders, and to present the organisation’s actions towards, and its impact upon, the environment and the society (Beattie, 2014; Gray et al., 1995; Guthrie et al., 2008). This agenda is also presented to shareholders as being supportive of the company’s traditional economic responsibilities (Al-Tuwaijri et al., 2004; Comyns and Figge, 2015) and, cater the expanding information needs of ethically and environmentally sensitive shareholders and institutional investors. It is argued that, even in a classical agency theory based conception of reporting requirements, additional information on the environmental and social dimensions of the corporate activities would enhance the informational symmetry between the investing principles and their managerial agents (Reverte, 2009). This paper focusses on corporate environmental reporting (CER), although many of the issues and approaches are shared with the assessment of social reporting, and traditional economic reporting.

The informational advantages emanating from CER to both investors and other stakeholders depend largely on CER ‘quality’ (see, Comyns and Faggi, 2015; Diouf and Boiral, 2017). However, the notion reporting quality is a rather debated and vague concept, especially in terms of how it can be modelled and measured (Diouf and Boiral, 2017; Tello et al., 2016). Defining in a variety of ways, its meaning is widely debated in the literature of voluntary disclosure (Francis et al., 2008); and it is a complex, multifaceted concept (Beattie *et al.*, 2004; Beretta and Bozzolan, 2008; Comyns and Figge, 2015). In many instances, the term *quality* has been used interchangeably with the term *transparency*, with both concepts being elusive (Liesen et al., 2015; Tello et al., 2016). Recent literature has advanced to include more focused dimensions to assess reporting quality, such as the style of disclosure, the range of issues addressed, the nature of the disclosure, the type of news being reported, and the time period covered (Daub, 2007; Diouf and Boiral, 2017; Gray et al., 1995; Michelon et al., 2015; Van Staden and Hooks, 2007). Gallery *et al.* (2008) state that quality of information is greater when more specific quantitative information, as opposed to less specific qualitative information, is

provided. There is also the argument that *quality of disclosure* can be defined as the precision of a Bayesian investor's beliefs about security value after receiving such disclosures, or the extent to which investors can easily read and interpret the information presented (Hopkins, 1996). Nevertheless, authors' standpoint is that reporting quality is by and large perceptual: it depends on the way in which both users and preparers perceive reporting quality and the way in which their conflicting perceptions arrive at a compromise in terms of practicalities involved in preparing, disseminating, reading and understanding CER contents (see, Diouf and Boiral, 2017). Hence, understanding the basic parameters upon which both users and preparers perceive quality is a fundamental necessity in developing any model of assessing CER quality. This paper aims at that.

Existing attempts to assess the quality of CER ignore this dialectic between the users and preparers, tending to select only a few characteristics such as a number of themes/topics covered, types of information disclosed, types of measures used, completeness, and/or reliability of disclosure perceived by the authors as the most important for assessing information quality (Cooke, 1989; Daub, 2007; Michelon et al., 2015; Van Staden and Hooks, 2007). For example, Al-Tuwaijti et al. (2004) adopted a weighted disclosure index to evaluate the quality of environmental disclosure. Based on the perceived importance of disclosure themes to stakeholders, they assigned the highest score (+3) to quantitative disclosure; score (+2) to non-quantitative but specific/detailed disclosure; score (+1) to general qualitative disclosure, and finally, score (0) for non-disclosure (see, also, Hughes et al., 2001). Another example, Daub's (2007) assessment model judges the quality of sustainability reporting based on the meaningful information disclosed. He used a weighted score range from 0 = no meaningful information to 3 = reporting full information of a detailed list of sustainability themes (Daub, 2007). Similarly, Van Staden and Hooks' (2007) index assesses the quality of environmental disclosure using a 5-point scale where 0 = no disclosure to 4 = truly extraordinary disclosure and benchmarking against best practice. Recently, Michelon et al. (2015) assessed the quality of social and environmental disclosure using the disclosure proxies that represent the quality along three different but complementary dimensions: (1) the quantity of the information disclosed (what and how much is disclosed), (2) the type of information used to describe and discuss CSR issues (how it is disclosed) and (3) the corporate managerial orientation towards CSR (see, also, Beretta and Bozzolan, 2008).

However, users focus on diverse traits and different indicators (Diouf and Boiral, 2017; Tello et al., 2016). For example, Hammond and Miles (2004) argue that quality assessment of corporate social responsibility (CSR) reporting relies on the ability of stakeholders to: (a) demand such information, and (b) evaluate its quality in a robust and reliable fashion in relation to actual performance. This argument implies that researchers cannot assess quality without a detailed understanding of users' needs. However, most studies of CSR disclosures simply impose their own measures on the data rather than consulting preparers/reporters and users/readers². For example, the CSR literature shows that disclosures come in a variety of forms, from very general to very specific, from narrative to quantitative, and from financial to non-financial – financial being classified as higher quality (e.g., Daub, 2007; Guthrie et al., 2008; Van Staden and Hooks, 2007), and also as more objective (e.g., Comyns and Figge, 2015; Michelon et al., 2015). Interestingly whether users actually value such enhanced disclosures more highly has not been addressed by previous researchers.

This paper seeks to address this by undertaking a questionnaire survey to investigate what preparers and users perceive as important factors depicting quality and the relative importance they place on those factors. Thereby, it develops a weighted multidimensional quality model (MQM). The following research questions were posed.

- a. How do preparers and users define the quality of CER? Do they differ in their definitions?*
- b. What do preparers and users view as the significant reasons for the importance of the quality of CER? Do the two groups differ in their views?*
- c. Which dimensions of quality are considered the most important? Do preparers and users differ in their perceptions of relative importance of these dimensions?*
- d. What do preparers and users perceive to be the most important measures of disclosure to be used? Do the views of the two groups differ?*
- e. What do preparers and users perceive to be the most important environmental themes to be disclosed? Do the views of the two groups differ?*

² It should be noted that standards that determine the reporting contents and processes (e.g., Global Reporting Initiative (GRI) and Integrated Reporting Framework) do involve a public consultation process. However, given the fact that their conceptual framework is by and large based upon the conceptual parameters of traditional financial reporting (e.g., materiality, entity concept, comparability, timeliness, reliability etc.), these consultations often take the form of seeking approval for a pre-given set of quality criteria.

- f. What do preparers and users perceive to be the most important types of environmental information to be disclosed? Do the views of the two groups differ?*
- g. What are the preparers and users views of the presentational features of CER, and how is the use of these features linked to their perceptions of the quality? Do the two groups differ in their views?*

Prior literature has measured the extent and quality of corporate reporting using a variety of metrics or indices and varying scoring systems (Beattie et al., 2004). However, most of these scoring systems were mainly simple metrics that used volume (e.g., Campbell, 2000), information types (e.g., Trotman and Bradley, 1981; Gray et al., 1995), and/or disclosure themes/topics (Al-Tuwaijri et al., 2004; Ingram, 1978; Wiseman, 1982), while some of them use weighted disclosure index (e.g., Al-Tuwaijri et al., 2004; Hughes et al., 2001; Michelon et al., 2015; Van Staden and Hooks, 2007) as proxies of reporting quality. In addition to the lack of attention on the pluralistic nature of quality, these metrics/indices also lack legitimate representation of the reporting quality perceptions of preparers and users. In this literature, the authors have often assessed reporting quality based on their own weighting of the importance of disclosed topics/items and/or the use of indices previously developed and used by other researchers. They apparently ignored the importance of representing the perceptions of preparers and users when considering what quality actually is.

The current study makes three main contributions to the existing literature on sustainability reporting. First, it provides new insight into the quality of CER by analysing the surveyed perceptions of 86 preparers and 177 users of annual reports and/or sustainability reports. It offers a more representative and therefore less subjective model for assessing reporting quality by incorporating the perceptions of both preparers and users into the analytical model (Beattie et al., 2004; Helfaya and Moussa, 2017). Second, this study sheds light on the reflexivity and critical judgment of both reporters and readers with regard to the quality dimensions of CER. In line with previous research (e.g., Beattie et al., 2004; Beretta and Bozzolan, 2008; Helfaya and Moussa, 2017; Van Staden and Hooks, 2007), this study provides further evidence that both the quantity and richness of content are necessary for assessing quality, but that they cannot be used on their own. In contrast to prior studies, with the MQM quantity and richness together represent 56%, while issues such as the credibility and visualisation of disclosure information represent 31% and 13% respectively. Third, by examining both reporters' and readers' perceptions of the quality of CER, this study contributes to the literature on the

compliance of CER and usefulness and credibility of disclosed information (Comyns and Figge, 2015; Diouf and Boiral, 2017; Helfaya and Kotb, 2016).

The paper is structured as follows. Next section reviews prior literature with the idea of articulating the theoretical and methodological underpinnings behind the existing attempts of developing conceptual frameworks to measure CER quality. Section three explains the research design. Section four presents the results of the questionnaire survey, and section five concludes the study.

2.0. Literature Review

2.1. Quality assessment of corporate disclosure

Like in any other field, literature related to the quality assessment of corporate disclosure needs to be assessed in terms of their methodological and theoretical underpinnings and implications (see Beattie, 2014; Diouf and Boiral, 2017; Tello et al., 2016). However, it should be noted that, while their methodological procedures and implications are somewhat explicitly dealt with, almost all existing literature in this particular field of study do not explicitly articulate their theoretical underpinnings. Hence, they by and large remain to be inferred from their methodological elements. Therefore, we begin with a discussion on the methodological approaches that the existing research has taken to assess quality of corporate disclosures and then try to explain their implicit theoretical underpinnings.

In methodological terms, underlying quality modelling is the interest in measuring disclosure quality (see Beattie, 2014; Beattie *et al.*, 2004), for which different ‘indices’ are constructed. On the basis of objectivity/subjectivity³ of the measures that such indices incorporate, these studies fall into two main categories: subjective analyst indices (e.g., Beattie et al., 2004; Healy et al., 1999; Imhoff, 1992; Sengupta, 1998) and semi-objective indices (e.g., Comyns and Figge, 2015; Diouf and Boiral, 2017; Liesen et al., 2015; Michelon et al., 2015). Subjective indices, such as AIMR disclosure ratings⁴, constitute corporate disclosure ratings assigned by

³ Here the term objectivity refers to an empiricist notion of objectivity where judgemental criteria are derived from the inherent ‘internal’ qualities of the disclosure contents. Subjectivity, on the other hand, relates to the instances where the judgemental criteria emanating from an ‘external’ framework or theory are superimposed on the disclosure contents. This empiricist notion of objectivity/subjectivity can then be contrasted with the ‘theoretical’ or ‘conceptual’ objectivity where the objectivity is attributed to the fact that the assessment criteria are derived from prior theoretical or conceptual framework (e.g., generally accepted accounting principles).

⁴ The Association of Investment Management and Research (AIMR) (Formerly the Financial Analysts Federation (FAF)). “FAF/AIMR reports contain industry-specific analyst evaluations of disclosure quality on three dimensions: 1) annual published information; 2) quarterly and other published information; and 3) analyst relations and related aspects” (Shaw, 2003, p.1044). Shaw also states that within these dimensions, each industry-specific analyst panel preparers a list of important disclosure aspects, weighted to reflect industry information requirements, and then

a panel of leading analysts in each industry. The development of semi-objective indices requires a pre-determined list of items (topics of disclosure) which is then tested for presence or absence. In an empiricist sense, since they are not explicitly related to the inherent qualities of the disclosure itself and since such list of items are derived from a ‘subjective’ (or rather external) conceptualisations of ‘standard disclosures’, this approach is more or less akin to a ‘disclosure audit’ against a pre-determined set of ‘standard criteria’. This approach, therefore, tends to standardize the disclosure practices, rather than providing opportunities for innovative practices, which is a critical element when the disclosure is based on voluntary participation rather than regulatory enforcements. This means that this approach superimposes conceptual impositions upon the companies ignoring the producers’ and users’ specific motives and intentions pertaining to voluntary information disclosures. Hence, assessment is not based on what the producers and users indeed expect through such disclosures but by certain set of externally imposed conceptual parameters.

Semi-objective indices, on the other hand, pay attention to the inherent characteristics of the disclosed information (Comyns and Figge, 2015; Diouf and Boiral, 2017; Liesen et al., 2015). Beattie *et al.* (2004) note that the majority of the corporate disclosure indices falls under the category of semi-objective indices, which are constructed through content analysis. As illustrated in Figure 1, such content analyses can be either (a) form oriented or (b) meaning oriented, signifying two distinct modes of analysis:

Form oriented mechanistic approach: where textual analysis-based ‘quantifications’ of the contents are carried out. This approach captures and describes a proxy that is assumed to be closely associated with the intended goal (e.g., Campbell, 2000; Wilmshurst and Frost, 2000). In general, these studies focus on volume or frequency of disclosure.

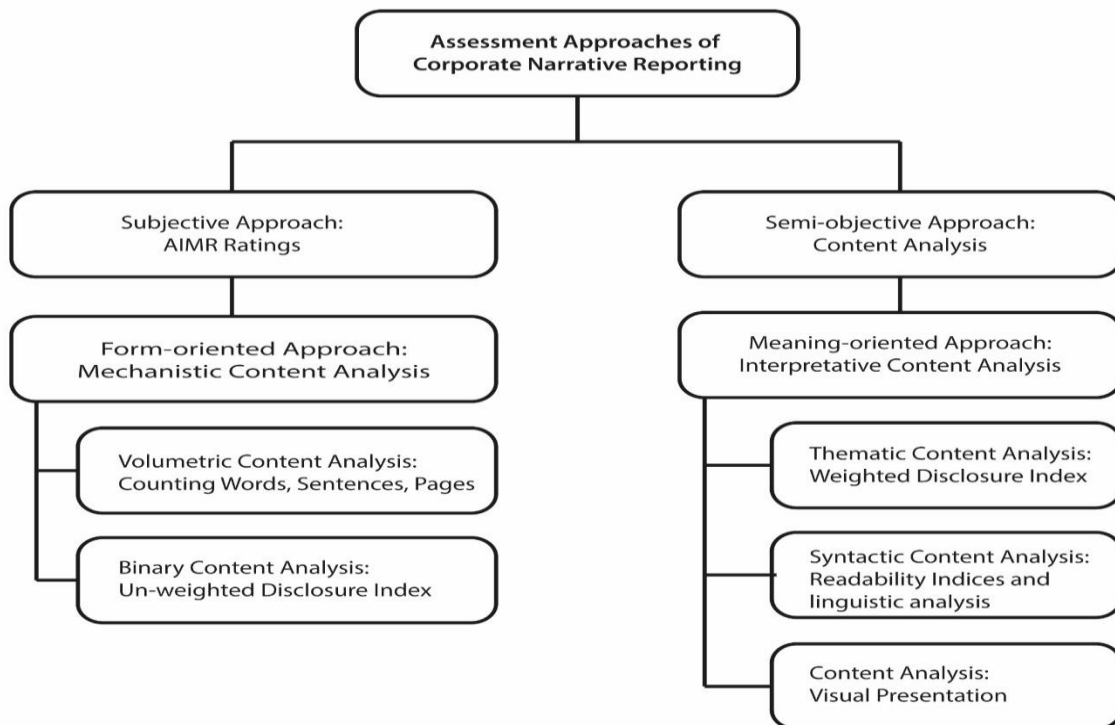
Meaning oriented interpretive approach: Smith and Taffler (2000) contrast form-oriented (mechanistic) with meaning-oriented (interpretative), suggesting that the former approach involves routine counting of words, sentences, lines, pages, or items, whilst the latter focusses on the meaning and nature of themes disclosed. Thus, meaning-oriented has a greater level of interpretation of the content rather than just

assigns a score to each firm. A total company rank is then computed as a weighted combination of the three category rates. Detailed discussions of the AIMR scoring process and the disclosure rankings can be found in Healy *et al.* (1999), and Sengupta (1998).

counting the disclosed items within a text. The nature of voluntary environmental disclosure lends itself to two further assessments of potential quality, both concerned with credibility. The first is whether a company has sought to attain performance levels in line with a specified set of standards, for example GRI or ISO⁵. The second is whether or not a company presents a report from an outside agency, effectively undertaking an audit, confirming the environmental information in the document.

Beck *et al.* (2010) state that meaning oriented content analyses have been widely adopted in the literature to analyse the textual content of reporting (e.g., Beattie *et al.*, 2004; Diouf and Boiral, 2017; Gray *et al.*, 1995; Jones and Shoemaker, 1994; Smith and Taffler, 2000; Wiseman, 1982). The weight of literature in this area is considerable with over 250 studies. Table 1 provides a classification of these studies and highlights the earliest papers for each of the approaches.

Figure 1: Classification of textual analytical approaches to corporate narratives



(Developed from Beattie *et al.*, 2004, and Beck *et al.*, 2010)

⁵ GRI – Global Reporting Initiative, see <https://www.globalreporting.org/>. ISO – International Organization for Standardization, see <http://www.iso.org/iso/home.htm>.

Table 1: Summary of previous approaches to researching reporting quality

Methodology of Assessing Reporting Quality	Disclosure of non-CSR Information					Disclosure of CSR Information				
	Earliest Study	No. of Studies (Total = 96)	No. (%)			Earliest Study	No. of Studies (Total = 131)	No. (%)		
			Developed Countries	Developing Countries	Both			Developed Countries	Developing Countries	Both
1. Subjective Approach: AIMR/FAF	Imhoff (1992)	18	100	0	0	None	0	0	0	0
2. Semi-objective Approach: Volumetric Content Analysis	None	0	00	0	0	Trotman and Bradley (1981)	35	89	11	0
3. Semi-objective Approach: Binary Content Analysis	Cooke (1989)	19	74	21	5	Ingram (1978)	54	45	4	5
4. Semi-objective Content Analysis: Weighted Disclosure Index Approach	Cerf (1961)	44	82	14	4	Wiseman (1982)	26	92	4	4
5. Semi-objective Content Analysis: Readability and Linguistic Analysis	Soper and Dolphin (1964)	15	93	0	3	Gamble <i>et al.</i> (1996)	16	76	12	12

To conclude, approximately 80% of the CSR disclosure studies have used simple measures of reporting quality (e.g., Comyns, 2016; Daub, 2007; Tauringana and Chithambo, 2015; Van Staden and Hooks, 2007). This may be due to:

- 1- The difficulty and time-intensive nature of using more complex frameworks,
- 2- Their unsuitability for external assessment of the quality of CSR disclosure,
- 3- The researchers' ignorance of the users' needs,
- 4- The inability to assess the materiality of the information disclosed versus not disclosed.

2.2. Theoretical implications

Explanations of sustainability reporting practices have long been a multi-theoretical polyphonic debate (see Beattie 2014; Bebbington et. al. 2017; Deegan, 2017; Lehman 2017), even though such theoretical developments have made only very little impact on the particular research focus we have here – measurement of disclosure quality. More than theoretical framing, research into measurement of disclosure quality is sophisticated and framed by the epistemological underpinnings of measurements. For example, in the recent years, large-scale linguistic study methods are now becoming popular, especially in the North American literature, supported by advancement in computerised natural language processing that have made it easier to carry out sophisticated content analysis (see Beattie, 2014). Yet, broadly speaking, we can decipher that there are two broad theoretical frameworks underpinning the disclosure quality assessment models we mentioned above.

First, the agency theory can be attributed to the subjective approaches mentioned above. That is because these models assume a privileging position for investors and the investment analysts in the decision-making processes and the assessments are primarily driven towards the usefulness of information for investment decisions (Reverte, 2009; Tom, 2002). Accordingly, the conceptual parameters by and large emanate from the traditional financial reporting conceptual framework (e.g., decision usefulness, materiality, entity concept, timeliness, relevance, etc.) which all nevertheless implicitly assume that 'investment' is the primary socio-economic and political decision/assessment towards which information needs to be provided (Reverte, 2009). At its best, therefore, the implication is that non-financial information including environmental reporting contents are to supplement the financial information

contents so that the investor can make environmentally sensible investment decisions (see, Michelin et al, 2015; Reverte, 2009; Tom, 2002).

Secondly, in a broader sense, stakeholder theory and legitimacy theory can be attributed to the semi-objective approaches (see, Comyns, 2016; Comyns and Figge, 2015; Helfaya and Moussa, 2017; Liesen et al., 2015; Tauringana and Chithambo, 2015). As they are not driven by a predetermined conceptual framework of decision-usefulness but by the inherent qualities of the actual information disclosed in the corporate reports, these models do not include a privileged user of such information. Instead, assumption seems to be that it is those inherent qualities that would ultimately determine the users of such information. From a producers' perspective, this also means that motivation for such disclosure are not necessarily to support a particular group of decision makers but to meet the demands of legitimation emanating from emerging discourses and regimes of corporate reporting (e.g., Helfaya and Moussa, 2017; Campbell, 2000; Liesen et al., 2015; Michelin et al., 2015).

3.0. Research design

A questionnaire-based experimental research design was adopted to analyse perceptions and to build a less subjective quality model, as this is both a practical and appropriate research tool to investigate the relatively subjective mind-sets (i.e., opinions, attitudes and perceptions etc.) of a large number of people with a view to (a) forming an 'ordinal' common ground and (b) identify categorical elements that define the research phenomena (Saunders *et al.*, 2009; Bryman and Bell, 2015). It was decided to use an online questionnaire for reasons of cost and also the increasing acceptance of this format (Schonlau *et al.*, 2002). The questionnaire tool was initially tested with two academic colleagues experienced with accounting research methods, and then by ten further academics who were experts in environmental accounting or related fields. The pilot volunteers were first approached to obtain their agreement for this task and their thoughts and comments were gratefully acknowledged and improved the focus and clarity of the survey instrument⁶.

The questionnaire experiment was designed in such a manner that the respondents can choose between whether s/he is a preparer or a user. In either case, the focal attention of the

⁶ A copy of the questionnaire survey is available upon request from the Authors.

questionnaire was on their perceptions/attitudes pertaining to how they judge the quality of CER information. Questions were three types:

- (a) Categorical questions where ‘tick mark choices’ were provided to ‘identify the most appropriate item or items from a list of items. These questions were used to profile respondent categories.
- (b) Categorical rating questions where ‘tick mark choices’ were provided to identify and rate the most appropriate ‘factors’ that determine/influence the user’s and preparer’s quality judgements. The ‘Other’ option gives the respondents the chance to add their own views, definitions, comments, etc.
- (c) Likert scale questions were used for the main concept questions where the subjective opinions/perceptions/attitudes pertaining to different aspects of quality judgements were assessed on a scale of one to five.

Quality is indeed not a fact but a subjective judgement based on subjectivities arising from one’s perceptions and attitudes. Hence, our methodology contains not fact finding but perception/attitude scaling – quantification of something which is inherently qualitative in its very nature in order to statistically test and explain that nature. As Likert (2007 [1932], p.233) asserts “it is essential that all statements be expressions of desired behaviour [i.e. desired dimensions of reporting quality in our case] and not statements of fact”. Likert scale has long been the most popular and statistically versatile techniques for this (Bryman and Bell, 2015), hence, Likert scale as our primary techniques of data collection.

The questionnaire was operationalised in a large sample. The nature of the research required the sample to consist of interested preparers and users. The sample needed to fulfil two criteria:

- 1- It should represent both preparers and readers of annual report (AR) and/or corporate social responsibility report (CSRR); and
- 2- Respondents should be capable of answering the research questions; they should have the necessary knowledge/awareness of the corporate reporting issues at hand to form an acceptable opinion/perception.

Whilst preparers may be homogeneous, users are more varied (including a variety of stakeholders – financial analysts, fund managers, environmental groups, assurance providers, academics, and postgraduate students with work experience in corporate reporting and/or

environmental performance matters as surrogates of business professionals)⁷. A heterogeneous or maximum variation sampling strategy (Saunders et al., 2009) was employed to construct a purposive sample⁸. The following steps were taken to build the sample:

- 1- Send the questionnaire survey to postgraduate and MBA students who have professional jobs and CSR experience at two British Business Schools;
- 2- Collecting the e-mail lists of popular environmental groups or government and non-government bodies concerning themselves with CSR reporting matters; and
- 3- Contacting corporate social responsibility research networks (e.g., SRRNet, CSR Centre, CSR International Members, and CSR-pedia Companies)⁹ directors to forward the covering letter with the online questionnaire link to their CSR network members.

A covering letter was included in the email and the first call resulted in 161 responses. To increase the number of responses, we sent our questionnaire survey participants another email to thank them if they have already completed and submitted their questionnaire surveys to us and if not we kindly encouraged them to do so as soon as they can¹⁰ (Saunders *et al.*, 2009; Bryman and Bell, 2015). As a result, we received 102 further usable responses after this second call. A breakdown of the responses by role and job title is given in Table 2(a) and by region / country in 2(b). The questionnaire was made available only in English, which may have limited the response from other areas of the world. A significant majority of preparers (80%) were from developed countries; 66% of users were from developed countries¹¹.

⁷ The results of accounting behavioural experimental research suggest that using postgraduate students as a proxy of business professionals such as accountants, investors, financial analysts, auditors, business decision-makers, etc., is a valid methodology choice. This provides researchers with adequate surrogates for their practising counterparts in structured decision contexts (see, Watson, 1974; Libby et al., 2002; Liyanarachchi, 2007)

⁸ Accordingly, this sampling approach does not allow for the calculation of a response rate due to overlapping membership of the communities.

⁹ For more details about these networks, their missions and targets, and the main categories of their members www.socialresponsibility.biz , www.csrcenter.net , www.csrinternational.org , www.csrpedia.com.

¹⁰ E-mail Calls for completing the Questionnaire survey are available upon request from the Authors.

¹¹ Developed economies are countries, which have reached high-income levels, usually through industrialization. While developing ones are countries which, starting from low-income levels, are pursuing economic growth, usually through industrialization and exploitation of natural resources (Morrison, 2015, p.370).

Table 2: Total responses received

2(a) Role / Title	N	%	% of Total
A- Preparers:			
- CSR Officers	58	67	21
- Accountants	10	12	4
- Directors	10	12	4
- Investor Relations Officer	4	5	2
- CEOs	2	2	1
- Public Affairs Managers	2	2	1
Sub-total	86	100	33
B- Users:			
- Academics	68	38	26
- Financial Analysts	48	27	18
- Environmental Group Members	25	14	10
- Assurance Service Providers	14	8	5
- Setters of Reporting Standards	14	8	5
- Others (e.g., Journalists, Consultants on Business Ethics and Consultants working in International Development, etc.)	8	5	3
Sub-total	177	100	67
Total	263		100
2(b) By Region/Country	Preparers	Users	Total
UK	31	44	75
Rest of Europe	17	44	61
Asia	18	40	58
Africa	5	11	16
US & Canada	8	17	25
South America	2	6	8
Australia	1	3	4
Total	82	165	247
	<i>Developed</i>	<i>109</i>	<i>175</i>
	<i>Developing</i>	<i>56</i>	<i>72</i>

As shown in Table 2 above, in the user category, academics represent relatively larger portion of the total users. It is true that academics and students are likely to be different from their non-academic counterparts in many respects such as age, experience, and wealth. However, it is unclear whether these ‘categorical differences’ override certain psychological features such as perceptions and attitudes in judgements, or have little impact on people’s judgement. This means that there is a valid possibility of surrogating academics and for non-academic counterparts. Libby et al (2002, p.803) for example, claim that “student subjects are also entirely appropriate in studies that focus on general cognitive abilities or responses to economic institutions or financial market forces”. In the same vein, Watson (1974, p.533) argues that “a valid surrogation is dependent upon certain properties of the objects (e.g. their involvement in producing the reports rather than using) not necessarily the objects in total”. After a careful

review of the literature on the debate of using student subjects in accounting experiments, Liynarachchi (2007) argues that students can effectively be used as surrogate to their practitioner counterparts as far as such student subjects have gained a sufficient understanding of the accounting phenomena relevant to the study. As such, the relatively high proportion of academics in the sample, need not necessarily be taken as a limitation because academics would reinforce other categories in the sample (rather than necessarily substituting or negating the average opinion formed through the survey). Their inclusion of course enhances the overall sample quality and reliability.

To test the reliability of the questionnaire survey, the internal consistency method was applied to the collected data by using Cronbach's Alpha¹²; this showed a reasonable degree of reliability being > 0.7 . Although self-completion questionnaires have advantages (low cost and quick to administer, absence of interviewer effects, convenience of respondents), they also face some limitations (see, Saunders et al., 2009; Schonlau et al., 2002; Bryman and Bell, 2015). Due to the lack of prompting or supervision available in the questionnaire survey, the researcher may face the problem of missing data as some respondents only partially answer the questionnaire. Finally, a lower response rate is generally achieved. The significance of a response rate is that, unless it can be proven that those who do not participate (respond) do not differ from those who replied, there is likely to be the risk of bias (Bryman and Bell, 2015).

The current study took some steps to overcome these limitations. First, the initial draft of the questionnaire was piloted to ensure that the questions were clear and covered the research objectives. Second, the option "other" was added for participants to give their own comments. Third, some questions were repeated using a different measurement scale, to ensure that the respondents carefully read the questions. Fourth, as the current research requires specific knowledge, it was decided to adopt a judgemental (purposive) sampling technique in selecting the sample, hence the sample was targeted at participants who have interest, experience, and knowledge in CSR matters. Finally, to enhance the response rate the questionnaire survey was sent to different databases of CSR practitioners and readers worldwide.

In the non-response bias test, the researcher compared "early" respondents ($n = 161$) with "late" respondents ($n = 102$) (as a surrogate of those who had not responded to the questionnaire).

¹² Cronbach's Alpha is the most common measure of reliability scale. It essentially calculates the average of all possible split-half reliability coefficients, with an indication that the acceptable value is 0.7- 0.8 (for more details see Field, 2013).

After conducting a non-parametric Mann-Whitney U test for all relevant questions, no significant difference was reported between “early” and “late” responses. This provides reassurance that the findings of the questionnaire can be treated with a reasonable level of confidence and generalised to the targeted population of CSR reporters and readers.

4.0. Results

4.1. Personal profiles of the respondents

As Table 3 shows, the total usable responses were 263, comprising 177 users (67%), and 86 preparers (33%). There were some notable features of the respondent set: 45% of the preparers reported that they had between 6 to 15 years of experience in CSR matters, compared to just 20% of users; more than half of respondents were less than 36 years old; a gender balance of about 50% of the respondents being female; 71% of respondents were from developed countries; a greater proportion of users had postgraduate qualifications, whilst a greater proportion of preparers were professionally qualified, both signifying their familiarity of the relevant accounting issues at hand.

Chi-squared and Z- tests were undertaken in order to determine whether the personal characteristics of preparers and users were statistically different. Interestingly, the first four categories – CSR experience, age, gender, and country – showed no significant difference between the two groups. However, the evidence for users having a higher level of academic achievement was significant at the 5% level and so was the evidence that preparers were more likely to be professionally qualified.

Table 3: Profiles of respondents

Background Information	Preparers (%)	Users (%)	Total (%)	Chi-squared	Z-test
1. CSR Experience:					
- Less than 6 years	44 (51)	125 (71)	169 (64)		
- 6-15 years	39 (45)	36 (20)	75 (29)		
- More than 15 years	3 (4)	16 (9)	19 (7)		
Total (%)	86 (100)	177 (100)	263 (100)		0.43
2. Age:					
- Less than 36 years	47 (55)	108 (61)	155 (59)		
- 36-55 years	37 (43)	57 (32)	94 (36)		
- More than 55 years	2 (2)	12 (7)	14 (5)		
Total (%)	86 (100)	177 (100)	263 (100)		1.62
3. Gender:					
- Male	46 (53)	89 (50)	135 (51)		
- Female	40 (47)	88 (50)	128 (49)		
Total (%)	86 (100)	177 (100)	263 (100)	0.302	
4. Country:					
- Developed	66 (80)	109 (66)	175 (71)		
- Developing	16 (20)	56 (34)	72 (29)		
Total (%)	82 (100)	165 (100)	247 (100)	1.74	
5. Qualifications:					
- Bachelor's Degree	86	177	263	} 5.27**	
- Master's Degree	41	102	143		
- PhD	6	36	42		
- Professional	27	23	50		
				5.65**	

*** = statistically significant at level 1% and ** = statistically significant at level 5%.

4.2. What does the quality of CER mean?

Based on the previous literature of corporate reporting (e.g., Gray et al., 1995; Beattie et al., 2004; Hammond and Miles, 2004; van Staden and Hooks, 2007), we classified CER quality definitions into a schema shown in Table 4. In second section of the questionnaire, therefore, respondents were asked to choose a definition of reporting quality but with the option to provide their own. The highest number of responses for both user and preparer panels was for the same statement: “the completeness, accuracy, and reliability of the disclosure” (see Table 4). Interestingly the “range of measurements used” had more appeal to users than preparers.

Table 4: Responses to different definitions of reporting quality

Definitions of Reporting Quality	Preparers	Users	Total
	No. (%)	No. (%)	No. (%)
The completeness, accuracy, and reliability of the disclosure	48 (57)	86 (49)	134 (51)
The type of information reported – historical and future-oriented, good, and bad news	15 (17)	29 (16)	44 (17)
The range of measurements used – narrative, quantitative, financial, and non-financial disclosure	13 (15)	43 (24)	56 (21)
The informativeness of the disclosures	7 (8)	11 (6)	18 (7)
The range of themes and types of environmental activities described	3 (3)	8 (5)	10 (4)
Total (%)	86 (100)	177 (100)	263 (100)

4.3. Does quality of reporting really matter, and why?

The quality of corporate reporting is vital to evaluate company's performance and making sound investment decision as high quality reports produce information that is timely, of value to the stakeholder, and reduce information asymmetry (Boesso and Kumar, 2007; Healy et al., 1999). According to the relevant literature (e.g., Beattie et al., 2004; Beretta and Bozzolan, 2008; Hammond and Miles, 2004; Michelon et al., 2015; Urquiza et al., 2009), we listed some reasons for the importance of the quality of reporting, though not exhaustive. Accordingly, the third section of the questionnaire was designed to ask the respondents to select the reason(s) for the importance of CER quality and/or add their own reason(s) using 'Other' option. The results of this section are shown in Table 5. Multiple responses were allowed and again both panels were agreed on the most frequent response that, this was related to improving environmental performance. The users were more likely to select a greater number of reasons for the importance of environmental reporting quality than the preparers, with usefulness and the ability to differentiate between companies seemingly more important to users, with the latter difference being statistically significant.

Table 5: Why is the quality of CER important?

Reasons for Importance	Preparers (n = 86)	Users (n = 177)	Total (n = 263)
	No. (%)	No. (%)	No. (%)
Effective tool for improving environmental performance	60 (70)	119 (67)	179 (68)
Ensures transparency, completeness, and usefulness of data to assess the environmental activities	49 (57)	103 (58)	152 (58)
Allow users to differentiate the environmental performance across companies	39 (45)	98 (55)	137 (52)
Help regulators and the public to take action to create a more sustainable environment	31 (36)	77 (44)	108 (41)
Discharge and enforce accountability	31 (36)	75 (42)	106 (40)
Other	1 (1)	5 (3)	6 (2)

4.4. Does quantity mean quality?

The next question related to the relationship between quality and quantity of information. A 5-point Likert scale was used, with 1 being “strongly disagree” (SD) and 5 being “strongly agree” (SA). Table 6 presents these results. The responses demonstrate a high degree of agreement between preparers and users about the importance of having high quality environmental reporting. Second, the respondents were asked their view about the following statement: “the quality of information reported is unrelated to its quantity”. The answers reveal an interesting split; both preparers and users have a sub-set that agreed and one that disagreed, with a few in the middle. Third, from both preparers’ and users’ standpoints, quantitative reporting was preferable to just qualitative. Nevertheless, 62% of users believed that there is a risk that companies can focus only on quantitative reporting to avoid other measures (e.g., specific/detailed narrative, financial measures, etc.). As shown in Tables 6, no significant differences were detected between both groups of respondents for the four views of the importance of both quantity and quality of CER, as measured by the Mann-Whitney U test. Additionally, one respondent states that:

“Quantity alone can be greenwash; quality ensures transparency, completeness etc. to allow the user to assess the environmental activities of

the firm. Both are correlated- you cannot have high quality with low quantity” (User, Academic).

Table 6: Responses to the importance of both quality and quantity to CER

Quality and Quantity of CER	Preparers Group (n = 86)					Users Group (n = 177)				
	% of Respondents			5-Point Mean	Std. Dev	% of Respondents			5-Point Mean	Std. Dev
	SD/D 1-2	N 3	A/SA 4-5			SD/D 1-2	N 3	A/SA 4-5		
The quality of environmental reporting is very important	6%	2%	92%	4.53	0.97	4%	3%	93%	4.47	0.83
The quality of the information reported is unrelated to the quantity reported	39%	25%	36%	2.91	1.32	41%	21%	38%	3.03	1.34
Reporting quantitative measures is always desirable	10%	21%	69%	3.86	0.98	6%	15%	79%	4.01	0.86
There is a risk that quantitative measures can become the major focus for a company to the exclusion of other reporting measures	21%	34%	45%	3.38	1.11	11%	27%	62%	3.67	0.90
5-Point Likert scale: 1 = Strongly Disagree (SA), 2 = Disagree (D), 3 = Neutral (N), 4 = Agree (A), 5 = Strongly Agree (SA)										

4.5. Which dimensions of quality are considered the most important?

Prior literature does not make a clear distinction between the quantity and the quality of disclosure, as it is generally assumed that the amount of information has a signal in determining its quality (Beretta and Bozzolan, 2008). Consistent with Beattie et al. (2004) and Beretta and Bozzolan (2008), the current study investigates the idea that quality is a multifaceted term and that quantity of disclosure is not sufficient to reflect its quality. This means that a multidimensional model is required for a fuller appreciation of reporting quality. In surveying the respondents, it was decided to leave out the readability/language dimension, as it was thought not an appropriate subject to address in this way (Beattie et al., 2004; Jones and Shoemaker, 1994; Marston and Shives, 1991).

Hence, the next section of the questionnaire inquired into respondents' views about the dimensions that should be used to evaluate the quality of reporting in general terms. Using a 5-point Likert Scale where 1 indicated "not at all important (NI)" and 5 indicated "very important (VI)", respondents were requested to state their perceptions of a series of statements that looked at different dimensions of assessing reporting quality, which were addressed in prior literature. For example, range of information disclosed (e.g., Al-Tuwaijri et al., 2004; Van Staden and Hooks, 2007; Walden and Stagliano, 2004), measures used (e.g., Berretta and Bozzolan, 2008; Michelin et al., 2015), use of external reporting standards and environmental audit (e.g., Birkey et al., 2016; Cohen and Simnett, 2015; Helfaya and Kotb, 2016; GRI, 2013), themes or subjects disclosed (e.g., Al-Tuwaijri et al., 2004; Berretta and Bozzolan, 2008; Van Staden and Hooks, 2007), use of visual presentation tools (e.g., Cho et al., 2012; Jones, 2011; Kamla and Roberts, 2010), and quantity of disclosure (e.g., Berretta and Bozzolan; Daub, 2007; Urquiza et al., 2009; Walden and Stagliano, 2004). The analysis in Table 7 reveals that almost all mean statistics among preparers and users are between 3.60 and 4.40 across nearly all dimensions. Additionally, standard deviations averaged around 0.90 for most dimensions suggesting a large extent of agreement between preparers and users to all dimensions. In this and following tables, scaling points 1 and 2 are combined as unimportant and 4 and 5 as important as this provides a clearer visual picture.

A further question probed the same area, asking the respondents to allocate 100 points between the seven dimensions based on the relative weighting that they would attach to each one. These results are shown in Table 8. The answers from preparers and users were similar. Interestingly, both groups gave the least weight to volume as an indicator of quality.

As shown in Tables 7 and 8, no significant differences were detected between the groups for all dimensions of quality as measured by the Mann-Whitney U test.

Table 7: Responses to the importance of different dimensions used to assess the quality of CER

Quality Dimensions	Preparers Group (n = 86)					Users Group (n = 177)					Preparer/User Mann-Whitney U Test	
	% of Respondents			5- Point Mean	Std. Dev	% of Respondents			5- Point Mean	Std. Dev	Z-value	2-tailed Sig
	NI/U 1-2	N 3	I/VI 4-5			NI/U 1-2	N 3	I/VI 4-5				
Range of information provided	3%	9%	88%	4.24	0.85	2%	4%	94%	4.40	0.70	-1.163	0.245
Range of measures used	6%	6%	88%	4.24	0.90	3%	6%	91%	4.33	0.77	-0.486	0.627
Use of external reporting standards	7%	13%	80%	4.23	0.93	2%	11%	87%	4.33	0.73	-1.654	0.100
The inclusion of an environmental audit	12%	15%	73%	3.95	1.10	4%	9%	87%	4.32	0.80	-2.694	0.010
Range of themes or subjects addressed	9%	20%	71%	3.84	0.92	5%	14%	81%	4.00	0.77	-1.253	0.210
Range of visual presentation tools used	10%	28%	62%	3.60	0.92	8%	22%	70%	3.80	0.93	-1.438	0.150
Volume of disclosure	49%	28%	23%	2.59	1.10	43%	28%	29%	2.83	1.17	-1.433	0.152

Notes: The mean response on 5-Likert scale and standard deviation are shown for each quality dimension. Responses were ranked by mean statistics of the preparers group.

Table 8: Perceptions of the relative importance of quality dimensions (100 points)

Quality Dimensions	Preparers (n = 86)		Users (n = 177)		Preparer/User Mann-Whitney U Test	
	Mean	Std. Dev	Mean	Std. Dev	Z-value	2-tailed Sig
Range of information provided	16.5	8.2	15.5	7.6	-1.353	0.176
Range of measures used	17.5	10.5	14.5	7.4	-0.465	0.642
Use of external reporting standards	15.6	7.8	16.4	8.6	-1.321	0.187
The inclusion of an environmental audit	15.4	7.5	14.6	8.5	-0.479	0.632
Range of themes or subjects addressed	13.6	7.2	14.4	8.2	-1.046	0.296
Range of visual presentation tools used	13.4	6.7	12.6	7.2	-0.615	0.539
Volume of disclosure	8.0	7.4	12.0	6.5	-1.412	0.158

Note: The mean and standard deviation are shown for each quality dimension. Dimensions were ranked by mean statistics of the preparers group.

Further questions were asked, probing each of the seven dimensions mentioned above, subsections below explaining the results.

4.5.1. Relative importance of the measures of CER

Some prior research contend that even if the extent of information disclosed affects the quality of this information, the assessment of reporting quality cannot mainly be based on this relationship (see Beattie et al., 2004; Beretta and Bozzolan, 2008). Thus, the richness of information content should be considered a proxy of information quality. Bereta and Bozzolan (2008, p.3) define richness as:

“A function of both the width of the disclosures on different topics regarding a firm’s business model and value creation strategy, and of the depth of the disclosures in relation to the presence insights into a firm’s future performance”.

Hence the respondents were asked for their views on the relative importance of five measures of depth of disclosure content for judging the quality level of CER. Table 9 illustrates that all mean statistics among the preparers and users are ranged between 3.36 and 4.46 across these five measures and standard deviations averaged around 0.80 for most of them, suggesting a large harmony between the two groups. More than 90% of both groups clearly perceived that “future plans and targets using forward-looking measures” was the most important measure that might affect the quality of CER. Another two measures, “quantitative non-financial disclosure”, and “quantitative financial disclosure” attracted high levels of importance as quality indicators, although a few preparers (9%) and users (2%) did not believe in the importance of either quantitative non-financial measures or quantitative financial disclosure. Users rated “quantitative financial disclosure” as statistically more important than preparers, possibly supporting the perceived tendency of reporters to avoid financial environmental disclosures that might undermine confidence (see, Diouf and Boiral, 2017; Toms, 2002; Tello et al., 2016). Finally, the qualitative (narrative) measures, “general narrative disclosure” and “specific narrative disclosure” are all significantly different from a neutral response (mean = 3.00). Users also rated “specific narrative disclosures” more highly than preparers.

Table 9: Responses to the importance of the different measures used to assess the quality of CER

Disclosure Measures	Preparers Group (n = 86)					Users Group (n = 177)					Preparer/User Mann-Whitney U Test	
	% of Respondents			5- Point Mean	Std. Dev	% of Respondents			5- Point Mean	Std. Dev	Z-value	2-tailed Sig.
	NI/U 1-2	N 3	I/VI 4-5			NI/U 1-2	N 3	I/VI 4-5				
Future plans and targets using forward-looking measures	1%	7%	92%	4.36	0.66	1%	5%	94%	4.46	0.64	-1.551	0.121
Quantitative non-financial disclosure	2%	13%	85%	4.32	0.75	2%	3%	95%	4.44	0.63	-1.920	0.110
Quantitative financial disclosure	9%	19%	72%	3.94	0.94	2%	6%	92%	4.36	0.68	-3.500	0.000**
Specific narrative disclosure	12%	22%	66%	3.72	0.96	2%	12%	86%	4.15	0.65	-3.278	0.001**
General narrative disclosure	19%	24%	57%	3.67	1.11	21%	39%	40%	3.36	0.90	-2.704	0.060

Notes: The mean response on 5-Likert scale and standard deviation are also shown for each measure. Responses were ranked by mean statistics of the preparers group. Figures in bold show statistically significant results where $p < 0.05$.

4.5.2. Relative importance of different environmental themes

To overcome the limitation of counting words, sentences, or pages to measure the extent of disclosure, Beattie et al. (2004) suggest that disclosure quality does not depend only on the amount disclosed, but also on how many different themes and sub-themes are covered.

Therefore, a list of six key environmental themes (topics) was developed based on relevant prior studies and the indicators of GRI (see, Al-Tuwaijri et al., 2004; Daub, 2007; Gray et al., 1995; GRI, 2013; Van Staden and Hooks, 2007). In this section of the questionnaire, respondents were asked to indicate their importance to the quality of CER, using a 100-point scoring system. The extent of relative importance allocated to each theme by the two groups of respondents is illustrated in Table 10. It seems that there is a broad consensus among the total respondents across all themes, apart from “environmental financial-related data”. The “climate change and sustainability issues” theme attracted the highest rate of importance from both preparers and users. The “energy and raw materials usage” theme was given the second highest rate of importance by both.

Perhaps unsurprisingly, preparers scored “environmental financial-related data” with the lowest value (12.10/100), compared with a rather higher perception of the users (17.90/100). The Mann-Whitney U test revealed a significant disagreement among the two groups on the relative importance of this theme. This finding supports previous sections where preparers did not rate financial data as highly as users.

Table 10: Perceptions of relative importance of environmental themes (100 points)

Environmental Themes	Preparers (n = 86)		Users (n = 177)		Preparer/User Mann Whitney U Test	
	Mean	Std. Dev	Mean	Std. Dev	Z-value	2-tailed Sig.
Climate change and sustainability issues	23.40	9.4	20.6	8.7	-2.564	0.010
Energy and raw materials usage (Inputs)	19.0	5.8	19.0	7.0	-0.639	0.523
Environmental-product and process related (outputs)	18.0	6.4	18.0	7.5	-0.170	0.865
Environmental policy	15.5	10.4	14.5	8.3	-0.262	0.794
Environmental financial-related data	12.1	6.9	17.9	7.7	-5.716	0.000**
Other environmental issues	12.0	9.9	10.0	6.7	-1.752	0.100

Note: The mean and standard deviation are shown for each theme. Themes were ranked by mean of the preparers group. Figure in bold shows statistically significant results where $p < 0.05$.

4.5.3. Relative importance of different types of environmental information

The types of information disclosed is another quality dimension considered important in assessing disclosure quality (see, Comyns, 2016; Helfaya and Moussa, 2017; Michelon et al., 2015; Taurigana and Chithambo, 2015). The types are categorised as quantifying bad environmental news, financial and non-financial environmental information, forward-looking environmental information and ongoing challenges, and benchmarking environmental performance. In order to obtain an overall perception of the relative importance of these types of information, respondents were asked to allocate 100 points and both groups gave a similar view of the relative importance of each information type, with similar means and standard deviations for each group, as seen in Table 11. Both groups rated “benchmarking environmental performance” information of the highest importance. While there was no statistically significant difference between preparers and users regarding “quantifying bad environmental news”, preparers perceived this to be less important.

Table 11: Perceptions of relative importance of types of information (100 points)

Types of Information	Preparers (n = 86)		Users (n = 177)		Preparer/User Mann-Whitney U Test	
	Mean	Std. Dev	Mean	Std. Dev	Z-value	2-tailed Sig.
Benchmarking environmental performance	28.4	11.1	27.3	11.6	-1.131	0.258
Forward-looking environmental information and ongoing challenges	27.2	9.1	24.9	8.8	-1.707	0.100
Financial and non-financial environmental news	25.8	10.6	25.9	11.0	-0.207	0.836
Quantifying bad environmental news	18.6	9.6	21.9	10.2	-2.224	0.030

Note: The mean and standard deviation are shown for each type. Types of information were ranked by mean of the preparers group.

4.5.4. Relative importance of visual presentation (communication) tools

David (2001) finds that users of corporate annual reports may spend only a short time looking at a report as part of their decision-making. Many investors look only at the financial review and then the narrative section; also, they often focus on financial graphs in making their decisions (Zweig, 2000). Compared to raw text, Kelly (1993) finds that tables and graphs are a more effective means of communicating a firm’s performance and are easier to assimilate than dense text.

The respondents were asked to express their opinions about the use of visual tools (e.g., graphs, tables, and pictures/images). Table 12 shows a general agreement among preparers and users that using tables, graphs, and pictures in preparing annual and sustainability reports would improve the perceived quality of these reports. For example, preparers’ mean score ranged from a low 3.81 for using pictures to high 4.22 for using graphs and 4.24 for using tables. It was the same for users’ mean scores. In other words, approximately 82% or more of both groups agreed that to enhance the quality of CER, tables and graphs should be used to disclose and communicate environmental performance. There was also great support from both

preparers and users for using pictures and images to manage the perceptions of a firm's environmental activities (70% & 68% respectively).

The role that visual tools and graphs might play in giving favourable impressions of environmental performance and/or to hide an unfavourable performance is summarised in Table 12. As might be expected, there was no broad agreement between preparers and users on these issues. For example, 18% of preparers did not agree that visual tools were used to reflect favourable performance, whilst the vast majority of users (82%) believed that companies may use visual tools for favourable news. Further, compared to only 12% of users, almost half of preparers (47%) disagreed that graphs may be used to hide environmental bad news. Both of these differences are statistically significant. Jones (2011) shows that there is clear evidence using graphs is linked to a self-serving managerial agenda (see, also, Cho et al., 2012; Kamla and Roberts, 2010).

Table 12: Responses to the relative agreement of using presentation tools to measure the quality of CER

Visual Tools	Preparers Group (86)					Users Group (177)					Preparer/User Mann-Whitney U Test	
	% of Respondents			5- Point Mean	Std. Dev	% of Respondents			5- Point Mean	Std. Dev	Z-value	2-tailed Sig.
	SD/D 1-2	N 3	A/SA 4-5			SD/D 1-2	N 3	A/SA 4-5				
Tables are a clear way to portray statistical figures and quantities	5%	13%	82%	4.24	0.85	2%	13%	85%	4.24	0.76	-0.410	0.683
Graphs are used to distil and communicate the trends of environmental performance	1%	11%	88%	4.22	0.68	4%	12%	84%	4.10	0.77	-1.228	0.220
Visual tools are used to give favourable impressions of a company's environmental performance	18%	22%	60%	3.86	1.56	7%	11%	82%	4.10	0.90	-3.300	0.001**
Pictures are used to manage perceptions of a firm's environmental activities	8%	22%	70%	3.81	0.90	8%	24%	68%	3.81	0.90	-0.023	0.982
Graphs might be used to hide an unfavourable environmental performance	47%	30%	23%	2.71	1.13	12%	32%	56%	3.63	0.99	-6.103	0.000**

Notes: The mean response on a 5-Likert scale and standard deviation are shown for each visual tool. Responses were ranked by mean statistics of the preparers group. Bold figures show statistically significant results where $p < 0.05$.

To assess the importance of textual content versus visual content in weighing the quality of CER, a further 100-point scale was developed. The respondents were given a list of four forms of content that were used to disclose environmental information and asked to express the level of importance of each form. The results in Table 13 indicate that both preparers and users gave similar weights to textual content versus visual content. Regarding the visual tools, the respondents also gave similar weights. The Mann-Whitney U test points to insignificant statistical differences in the respondents' opinions about the relative importance of textual contents versus visual contents.

Table 13: Perceptions of relative importance of using textual vs. visual content to the quality of CER (100 points in total)

Textual and Visual Content	Preparers (n = 86)		Users (n = 177)		Preparer/User Mann-Whitney U Test	
	Mean	Std. Dev	Mean	Std. Dev	Z-value	2-tailed Sig.
Textual content	29.7	11.2	28	11.5	-1.223	0.221
Tabular content	26.7	13.3	28.7	13.8	-1.957	0.100
Graphical content	26.1	9.0	26.6	8.3	-0.633	0.527
Pictorial content	17.5	9.8	16.7	9.2	-0.834	0.404

Note: The mean and standard deviation are shown for each theme. Types of Information were ranked by mean of the preparers group.

4.5.5. Respondents' views on the quality of CER

The questionnaire contained a few open questions (i.e., the 'Other' option) for respondents to describe their own definitions of quality; this allowed them to explain why quality of environmental reporting is important, or to add personal comments. These were quite instructive and revealing further details behind the respondents' answers to the other 5-point Likert scale or 100-points scale questions, with some holding fairly positive views about the quality of CER. The following is a selection of the more interesting comments:

"Most companies have a major blindspot when it comes to reporting the single key issue relevant to their activities. So for example: Fast food companies should have detailed information on obesity; Oil company should have a lot to say about climate change and the future

of their main products ... and Banks how they are providing the poorest in the world with access to finance e.g., through microcredit. In 20 years of advising major corporations, I have found that these corporate blindspots are almost universal.” (Preparer, CSR Consultant)

“It does not really matter whether the company uses graphs or pictures or tables or text to bring its point across. It can use whatever it needs, but it really just needs to be **honest**. We can now rather easily cross-check accounts of events by different parties. Honesty in reporting is only sensible risk-management strategy.” (User, Academic)

“Corporate Environmental Reporting should be reported by any company without any bias, hidden facts, diplomatic results, etc.” (Preparer, CSR Officer)

Clearly, as noted above, these comments reveal that these respondents, both preparers and users, have good knowledge and experience concerning the quality of reporting and its importance.

4.6. What makes a quality CER?

As voluntary disclosures are communication tools, their quality needs to be assessed in terms of their ability to cover essential matters to stakeholders in a direct and concise way (Boesso and Kumar, 2007). Targeting the measurement of this quality, the academic literature employs a variety of measures/proxies to assess corporate reporting (Beattie et al., 2004).

Empirical studies, however, fail to make a clear distinction between the quantity and quality of disclosure (Berretta and Bozzolan, 2008), and the mainstream of these studies assume that the quantity of disclosure is a proxy for its quality (e.g., Marston and Shrives, 1991). The remaining aim of this study is to develop a less researcher-defined multidimensional model based on the preparer and user perceptions of the relative importance of the different quality dimensions. The analysis of 263 responses identified seven major proxies/measures to evaluate environmental reporting. As shown in Table 14, the score of each proxy is based on its relative importance to the total statistical means of the seven proxies¹³. Therefore, the scores of the proxies are ranked as follows: 1) information types (16%); 2) measures disclosed (16%); 3) reporting standards (16%); 4) environmental audit/assurance (15%); 5) environmental themes (14%); 6) visual tools (13%), and 7) volume disclosed (10%).

¹³ For instance, the sum of all 5-point means of the 7 proxies = 27.55. So, the relative importance of Volume = $2.75/27.55 = 10\%$ of the total quality score (100 points).

Table 14: Total responses to the importance of different quality dimensions

Quality Dimensions	No. of Respondents (%)					
	N	NI/U 1-2	N 3	I/VI 4- 5	5- Point Mean	Std. Dev
Information types	263	6 (2)	15 (6)	242 (92)	4.35	0.74
Measures	263	9 (3)	16 (6)	238 (91)	4.30	0.81
Reporting standards	263	8 (3)	31 (12)	224 (85)	4.30	0.81
Environmental audit/assurance	263	17 (6)	29 (11)	217 (83)	4.20	0.90
Themes	263	17 (6)	42 (16)	204 (78)	3.95	0.82
Visual tools	263	22 (8)	62 (24)	179 (68)	3.70	0.93
Volume	263	117 (45)	74 (28)	72 (27)	2.75	1.14

We re-classify these seven proxies of assessing reporting quality into three major quality dimensions based on the nature of these proxies: 1) the quality of content; 2) the quality of credibility; and 3) the quality of communication. These “3Cs” (i.e., Content, Credibility, and Communication) are then sub-divided into seven proxies and eighteen sub-proxies with weightings derived from questionnaire responses.

4.6.1. The quality of content: how much, what, and how is it disclosed?

Prior studies document that quantity of disclosure is a primary dimension of disclosure quality (i.e., the more information reported, the higher information quality) (e.g., Beretta and Bozzolan, 2008; Gray et al., 1995). However, relative quantity disclosed is only one quality dimension (Beattie et al., 2004). Another dimension is the richness of this disclosure which includes, for example, variety of different information types disclosed, variety of measures (depth) disclosed, and the spread of disclosures across themes/topics (width) addressed (e.g., Al-Tuwaijri et al., 2004; Beretta and Bozzolan, 2008; Daub, 2007; Helfaya and Moussa, 2017; GRI, 2013; Michelon et al., 2015; Urquiza et al., 2009; Van Staden and Hooks, 2007; Walden and Stagliano, 2004). Analysis in Table 14 reveals that the content dimension represents 56% of the total quality score: information types (16%), measures (16%), themes (14%), and volume

(10%). The relative importance of these four proxies and fifteen sub-proxies are discussed below.

4.6.1.1. Types of information (16%)

This proxy represents 16% of the total quality score, as is clear in Table 14. A summary of the respondents’ answers to the relative importance of different types of information is given in Table 15. Based on the statistical means of these different information types, they are ranked as follows:

- 1- The mean of each information type is compared to the sum of all means of information types.¹⁴
- 2- The relative importance of each information type is compared to the relative importance of information types’ proxy (16%).¹⁵

As apparent in Table 15, 263 respondents identify four types of information, which are ranked according to their relative importance to the total score of information types (16% of the total reporting quality score) as follows:

- 1- Benchmarking performance (28%);
- 2- Forward-looking information (26%);
- 3- Financial and non-financial information (26%), and
- 4- Quantifying bad news (20%).

Table 15: Perceptions of relative importance of types of information (100 points)

Types of Information	Total Respondents		
	N	Mean	Std. Dev
Benchmarking environmental performance	263	28	11.4
Financial and non-financial information	263	26	10.8
Forward-looking information and ongoing challenges	263	26	9.1
Quantifying bad environmental news	263	20	10.1

¹⁴ The sum of all statistical means = 100. Thus, the relative importance of quantifying bad news = 20/100 = 20%.

¹⁵ For example, the relative importance of quantifying bad news (20%) is computed as a percentage of 16% = 3%, and so on for all types of information.

4.6.1.2. Measures disclosed (16%)

As discussed above, this proxy represents a further 16% of the total quality score. Table 16 provides an overview of the preferences of 263 respondents to different measures used to report environmental issues. It is evident that the respondents prefer disclosing more information concerning forward-looking environmental plans using quantitative measures, as well as both quantitative financial and non-financial disclosures. Applying the same approach as before to calculate the relative importance of each measure and compute its materiality with the total score of this proxy (16%). Based on the analysis of responses to this section in the questionnaire survey, the relative importance of the five measures is identified and ranked as follows (see Table 16)¹⁶:

- 1- Future plans and targets using forward-looking measures (22%);
- 2- Quantitative environmental disclosure (22%);
- 3- Financial environmental disclosure (20%);
- 4- Specific narrative disclosure (19%), and
- 5- General narrative disclosure (17%).

This result supports the findings of Toms (2002), who examined investment professionals' perceptions of the importance of disclosure measures. He saw the future plans and targets, and both quantitative and financial disclosures as of the highest importance, followed by specific disclosure and, finally, general disclosure. As shown in Table 9, there is a significant difference between the two groups of respondents for two measures; the specific narrative disclosures and financial disclosures (p-values are 0.001 and 0.000 respectively). These two types of disclosures – financial and specific narrative environmental information – are seen as very important by users. This raises the possibility of needing two MQMs, a preparer MQM, and a user MQM with different weights applied to each quality proxy.

¹⁶ As seen in Table 16, the sum of all statistical means = 20.44. Thus, the relative importance of general narrative disclosure = $3.54/20.44 = 17\%$. Additionally, the relative importance of general narrative disclosure (17%) is computed as a percentage of 16% = 3%, and so on for all measures disclosed.

Table 16: Total responses to the importance of different measures

Measures	No. of Respondents (%)					
	N	NI/U 1-2	N 3	I/VI 4-5	5- Point Mean	Std. Dev
Future plans and targets using forward-looking Measures	263	2 (1)	14 (5)	247 (94)	4.42	0.65
Quantitative disclosure	263	4 (2)	16 (6)	243 (92)	4.40	0.68
Financial disclosure	263	10 (4)	27 (10)	226 (86)	4.14	0.80
Specific narrative disclosure	263	13 (5)	41 (16)	209 (79)	3.94	0.80
General narrative disclosure	263	53 (20)	91 (35)	119 (45)	3.54	1.10

4.6.1.3. Environmental themes (14%)

The spread (width) of environmental topics covered in CER indicates 14% total quality score. Table 17 shows that the six themes compiled from prior literature (e.g., Al-Tuwaijri et al., 2004; Daub, 2007; GRI, 2013; Walden and Stagliano, 2004) should be addressed in an environmental report to enhance its quality. The ranks of themes vary according to respondents' perceived importance of each theme to the score of environmental themes proxy (14%). Based on the analysis of 263 responses as in Table 17, six environmental themes are identified and weighted as follows¹⁷:

- 1- Climate change and sustainability matters (22%);
- 2- Energy and raw materials usage (inputs) (19%);
- 3- Environmental-product related data (outputs) (18%);
- 4- Environmental-financial data (15%);
- 5- Environmental policy (15%), and
- 6- Other environmental data (11%).

¹⁷ The sum of all statistical means = 100. Thus, the relative importance of other environmental issues = $11/100 = 11\%$. For example, the relative importance of other environmental issues (11%) is computed as a percentage of $14\% = 1.54\%$, and so on for all environmental themes.

However, a significant statistical difference was detected between the two groups of respondents concerning the importance of environmental-financial-related data (p-value = 0.000), again raising the question of whether two MQMs should be derived.

Table 17: Perceptions of relative importance of environmental themes (100 points)

Environmental Themes	Total Respondents		
	N	Mean	Std. Dev
Climate change and sustainability issues	263	22	9.1
Energy and raw materials usage (inputs)	263	19	6.6
Environmental product- and process- related (outputs)	263	18	7.1
Environmental policy	263	15	9.1
Environmental-financial-related data	263	15	9.1
Other environmental issues	263	11	7.6

4.6.1.4. Volume (quantity) disclosed (10%)

In contrast to most prior academic literature (e.g., Beretta and Bozzolan, 2008; Gray et al., 1995), which has assumed that quantity is a primary dimension for measuring reporting quality, the respondents rated volume of disclosure as the lowest component of the total quality score. As seen in Table 14, approximately 50% of respondents perceived that volume of disclosure as not important for quality compared with only 27% as important.

4.6.2. The quality of credibility: how is it credible?

Besides the content of information disclosed, the users' perception of the credibility of information in sustainability reports should also be targeted (Birkey et al., 2016; Helfaya and Kotb, 2016; Hodge et al., 2009). Credibility and reliability are achieved in two ways in environmental disclosure: (1) the adoption of external sustainability reporting standards and (2) the assurance of the reports by an independent third party (external auditor/assurer). Both are perceived to improve the quality of information disclosed (Comyns, 2016; Peters and Romi, 2015; Talbot and Boiral, 2016). Table 14 reflects this with a 31% weight attributed to this dimension by the 263 respondents. Two proxies of this dimension were weighted by the two

groups of respondents: adopting external reporting standards (16%), and the inclusion of environmental audit/assurance (15%).

4.6.2.1. Adopting external reporting standards (16%)

To enhance the quality of information reported, preparers should follow specific reporting guidelines (e.g., GRI, ISO, DEFRA, etc.) (Helfaya and Kotb, 2016; Michelon et al., 2015; Tauringana and Chithambo, 2015). Of the respondents, 85% saw the adoption of reporting guidelines as a good step in raising reporting quality (see Table 14).

4.6.2.2. Environmental audit/assurance (15%)

Assurance services are defined broadly by Beattie (2000, p.4) as:

“Independent professional services that improve the quality of information, or its context, for decision makers, a definition which embraces both the reliability and relevance of information”.

Therefore, to increase users’ confidence and perceptions of information credibility, sustainability and environmental reports should be assured by an independent third party (Birkey et al., 2016; Cohen and Simnett, 2015; Helfaya and Kotb, 2016; Michelon et al., 2015). After analysing the questionnaire’s responses, the result indicates that about 83% of respondents perceived the importance of the inclusion of an environmental audit to improve the quality of environmental information disclosed (see Table 14). This result supports the findings of prior studies and the increasing practice of large firms. There has been significant growth in providing assurance statements within published sustainability reports of the global top 250 companies; 63% in 2015 compared to 59% in 2013 (KPMG, 2015). Additionally, in 2015, 42% of the top 100 companies in 45 countries choose to assure their sustainability reports, and 64% of them continued to select big accounting firms to provide assurance services (KPMG, 2015).

4.6.3. The quality of communication: how is it presented?

The modern corporate report contains a package of narrative, graphical, and pictorial content (Beattie, 2000; Cho et al., 2012; Jones, 2011; Kamla and Roberts, 2010). The layout of a corporate report, therefore, plays a crucial role in the quality of information disclosed. Thus, the final dimension to complete the quality picture is how this information content is presented.

Respondents weighted the use of visual tools with 13% of the total quality score (see Table 14). Table 18 provides an overview of some visual tools that make environmental reporting

more qualitative and attractive to read. The respondents identified and weighted¹⁸ three tools (communication proxies) that may be used to improve the quality of communicating corporate environmental performance, as seen in Table 18. Hence, the relative weights become tabular format (35%), graphical format (34%) and pictorial format (31%).

Table 18: Total responses to the relative agreement using visual tools

Visual Tools	No. of Respondents (%)					
	N	SD/D 1-2	N 3	A/SA 4-5	5-Point Mean	Std. Dev
Tables	263	8 (3)	34 (13)	221 (84)	4.24	0.80
Graphs	263	8 (3)	30 (11)	225 (86)	4.13	0.74
Pictures	263	21 (8)	62 (24)	180 (68)	3.81	0.90

4.7. A multidimensional quality model (MQM)

Assessing the measurement of the quality assessment of annual and sustainability reporting is of paramount importance (Hammond and Miles, 2004; Helfaya and Moussa, 2017; Michelin et al., 2015), which builds on the assumption that high disclosure quality should help external stakeholders in evaluating past and likely future performance. Also, Beattie et al. (2004) called for new ways of documenting disclosure practices, identifying dimensions of disclosure quality, and finding possible less subjective measurement proxies to be developed. One of the main targets of the present study is to fill this gap by producing a more representative quality assessment framework (multidimensional quality model – MQM) according to the quality perceptions of preparers (reporters) and users (readers) of ARs and/or CSRRs.

Three significant differences between preparer-user perceptions were shown in Tables 9 and 10 regarding the importance of specific narrative and financial-environmental disclosures (see Table 9), and the financial-environmental data theme (see Table 10). This may imply a need for two distinct MQM models, as suggested below. Previous literature shows the importance of disclosing specific narrative and financial-environmental information (e.g., specific environmental policy, environmental liabilities, fines, expenditures, and investments) to

¹⁸ The sum of the statistical means of the three visual tools = 12.18. Thus, the relative importance of tables = $4.24/12.18 = 35\%$, and the same for graphs and pictures (34% and 31% respectively). Additionally, the relative importance of tables (35%) is computed as a percentage of $13\% = 4.55\%$, and so on for both graphs and pictures.

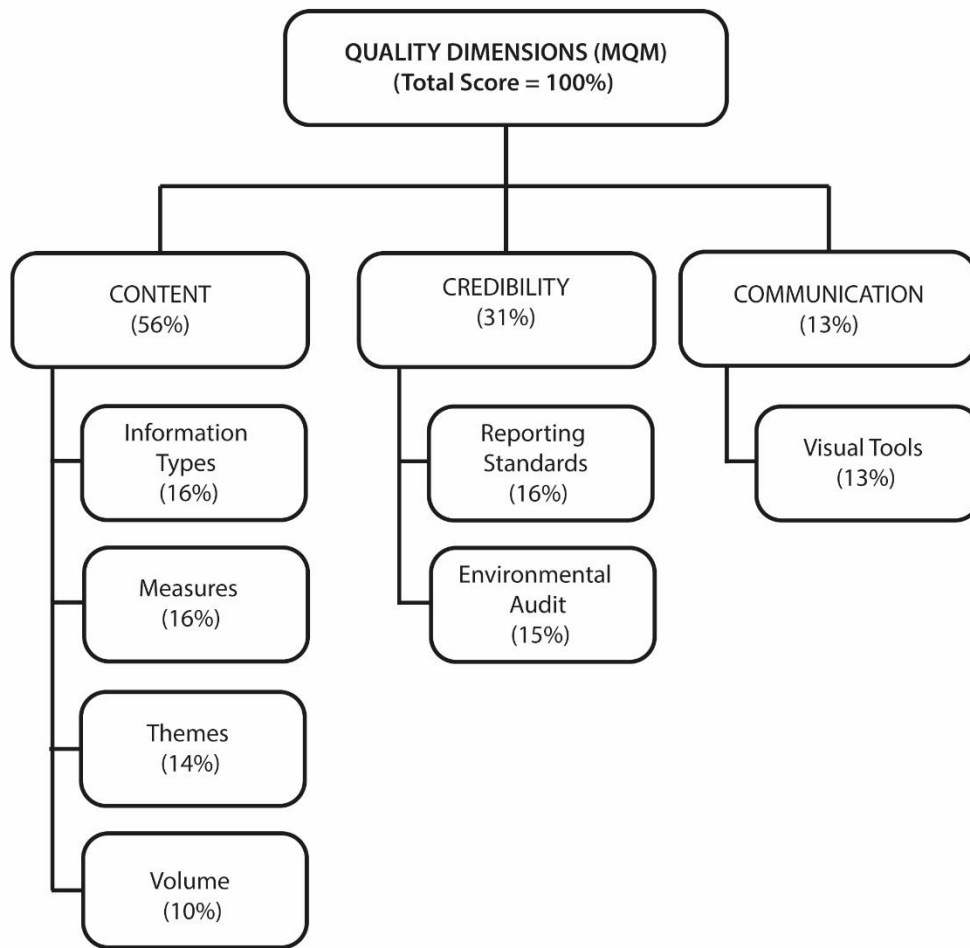
stakeholders (e.g., Al-Tuwaijri et al., 2004; Daub, 2007; Helfaya and Moussa, 2017; Michelon et al., 2015; Van Staden and Hooks, 2007). Such views may also change over time and be related to events that may change the perception of importance, an obvious example being the oil spill in the Gulf of Mexico in April, 2010¹⁹.

The MQM shown in Figure 2 is based on the analysis of the average importance perceived of different quality measures/proxies of the total amount of responses from 177 preparers and 86 users, 263 responses in total. Three major dimensions (3Cs) were identified and weighted with the total score 100 points: content (56 points); credibility (31 points), and communication (13 points). Additionally, seven proxies and eighteen sub-proxies were also identified and weighted according to their relative importance of both content and communication dimensions.

Unsurprisingly, the highest weight was assigned to the quality of information content (56%) compared with credibility and quality of communication (31% and 13% respectively). In contrast to the present study, most prior studies focussed only on the quality of content using volume, themes, and/or measures disclosed to assess the disclosure (e.g., Michelon et al., 2015; Uргуiza et al., 2009; Van Staden and Hooks, 2007). More recent academic studies show some increased recognition of non-quantity proxies for quality, this is supported by the findings here where respondents weighted volume at only 10% of the quality score.

¹⁹ For example, in the following annual and sustainability reports, BP (the company most commonly associated with the disaster) discloses the significant financial impacts to the company, detailing over \$60 billion of expected costs (BP AR, 2010). This event triggered a dramatic fall in the BP share price. In 2016, the BP paid \$6.9 billion for the oil spill with the expectation to fall to \$4.5-5.5 billion in 2017, £2 billion in 2018 and a little over \$1 billion per year thereafter (BP AR, 2016). It is possible that such events will increase the perceived need for specific narrative and financial-environmental disclosures in future.

Figure 2: A multidimensional model of the perceived quality of CER



5.0. Conclusions

The analysis of 263 responses (i.e., 177 preparers and 86 users) shows that approximately 51% of both preparers and users define environmental reporting quality as “the completeness, accuracy, and reliability of environmental disclosure”. Quality is a key concept in academic research, but the term is complex and subjective. Therefore, the quality of a disclosure must refer to many different attributes because different persons preparing or using such documents have their own ideas about the information characteristics, measures, and types of information that ought to be disclosed in a quality report. The attributes of reported information are: level and range of topics disclosed, types of information (e.g., good, neutral or bad news, historical and future information), and measures used (e.g., narrative versus quantitative, quantitative versus financial, or benchmarking performance), credibility of information disclosed using

reporting guidelines and inclusion of third-part auditing, and visualisation of the information. So, this study concludes that quality is a multi-faceted concept and there is no single definition.

The results also show that there was no statistically significant difference in the relative importance of the seven dimensions between the two groups. At a deeper level, there were some differences with users being less satisfied with recent reports they had read and perceiving quantitative information as more important. They were also more sceptical of the purpose of visual presentation than the preparers. A further issue is that we can only directly assess their reaction to published, rather than unpublished, information; the scepticism may be due in part to what is missing rather than what is present. The MQM shown in Figure 2 is based on the analysis of the average importance perceived of different quality measures/proxies of the total amount of responses from 177 preparers and 86 users. Three major dimensions (3Cs) were identified and weighted with the total score 100 points: content (56 points); credibility (31 points), and communication (13 points). Additionally, seven proxies and eighteen sub-proxies were also identified and weighted according to their relative importance of both content and communication dimensions.

This preparer-user defined MQM implies that quality is a multidimensional term which has many attributes covered by three main dimensions (Beattie et al., 2004; Beretta and Bozzolan, 2008). Further, in contrast to previous literature, both quantity and richness of content cover only one dimension of quality (56%), while the other two dimensions, credibility and communication, cover the other 44% of the quality dimension. Thus, evaluating the quality of content is not enough to reveal the total disclosure quality. Rather, quality of content, as a measure, should be combined with measures of credibility and communication. To conclude, previous literature does not make a clear distinction between the quantity and quality of disclosure, although it is generally assumed that the volume of information given helps to determine its quality. The current study, therefore, supports the idea that quality is a multi-faceted notion and that the quantity of disclosure is not a sufficient measure of its quality. Consequently, the development of a MQM that includes more parameters than just quantity is required for a better understanding of reporting quality.

5.1. Research contributions and practical implications

First, an important contribution of this study is the analysis of the quality of CER from the perceptions of both reporters and users of corporate reporting. While prior literature on assessing the quality of corporate reporting used subjective analysts indices and/or semi-

objective quality indices, an exclusive focus on quantity and/or few features of quality (e.g., number of themes/topics covered, types of measures and information disclosed, etc.) is likely to show only part of the picture of CER quality. Analysing the quality perceptions of both reporters and users of corporate reporting contributes to filling this gap. Second, the study shows the reflexivity and critical judgments of both reporters and users of the quality of corporate reports. The quality perceptions of 263 respondents provided a less subjective MQM of assessing the quality of CER, based on reliable and credible criteria of covering the key features of quality. In this MQM, both quantity and richness together represent only 56%, while issues such as the credibility and visualisation of disclosure information represent 31% and 13% respectively. Third, by examining both reporters' and users' perceptions of the quality of CER, this study contributes to the literature on the compliance of CER and quality of environmental disclosure.

Finally, this research may have regulation and policy implications. It is also informative for researchers, pressure groups, standard setters, and policy makers alike. The questionnaire's findings would suggest that preparers' and users' opinions on the definition and importance of quality and the key measures of reporting quality were largely similar. However, users perceived financial impact disclosure and detailed narrative disclosures as of more value than preparers. They also had a more sceptical view of the use of graphs to convey environmental performance than preparers. Therefore, for a high quality of reporting corporate environmental activities and performance, there has to be authoritative powerful pressure on management to take into account not only general disclosure and quantitative information but also financial environmental impacts and detailed qualitative information. Further, policy makers are required to enforce the environmental disclosure laws and insist on compliance through continuous monitoring and penalising failure to disclosure. Reporters are also required to cautiously use presentation tools, especially graphs to convey the environmental performance.

5.2. Limits and avenues for future research

This study was carried out through 263 questionnaires responses from various reporters and users of corporate reporting. Therefore, the possibilities of guesswork and biased interpretations of the questionnaire elements by the respondents are expected. Further, the question asking the respondents to split 100 points between the seven dimensions provides the possibility of the development of a model using all seven dimensions weighted by the survey respondents. An outline for such a model, including the weights taken from the questionnaire responses, is shown in Figure 2. The differences between users and preparers, noted in the

paragraph above, imply the need to test both preparer and user MQMs, in case these differences on a few of the second level components of the model make a significant difference to the perception of quality of reporting. The questionnaire led to a useful level of response, but a further study might seek to balance the range of preparers, in particular, from different parts of the world and also to categorise users, as shareholders and environmental activists may have different demands and expectations.

A critical question is whether or not this more sophisticated, and labour intensive, multi-dimensional approach actually makes a difference. A sample set of companies would enable the relative reporting quality of the companies to be assessed on each of the seven dimensions and the new multidimensional model. Finding the dimension that most closely matches the new model could potentially be a practical, low-cost proxy for the more sophisticated model. Other previous quality models could also be tested against the MQM on this basis (e.g., Al-Tuwaijri *et al.*, 2004; Beretta and Bozzolan, 2008; Michelon *et al.*, 2015; Urquiza *et al.*, 2009; Van Staden and Hooks, 2007); again a simpler model with similar ranking results would be an attractive time-saving option for quality assessment.

The readability/language dimension was omitted from the questionnaire, and hence the suggested model. Whilst this may be considered as represented by the visual presentation dimension, this is an area of significant previous research, and a further study should seek to introduce this to a multidimensional modelling of quality. If a larger sample of users had been obtained from the survey, with a greater spread between the different categories of user, the question of whether different user groups had different perceptions of quality could also have been addressed. As users include both shareholders and their advisors on one hand and environmental lobby groups on the other – two groups with potentially differing objectives – different definitions of quality must be a possibility.

The questionnaire was inevitably vague about dissemination method used for communicating the environmental information. Past studies have almost all focussed on the AR's environmental content; however, analysis of stand-alone CSRRs may be a better way to assess quality of reporting. The increased volume of content in a CSRR would mean that assessing the quality of the environmental section would be more time consuming, however the extra effort may be worthwhile if it led to different results from the AR. The rise of integrated reporting may also lead to a different balance of content and style of communication and the perceptions of users and preparers may differ here too. It is also clear that corporate websites

are an ever increasing route for environmental information to be conveyed. Finally, the interactive use of social media by preparers (companies) to communicate with user groups could also be examined.

It was noted above that the passing of time and key events may change the weights in the MQM. Further issues that are likely to affect the appropriate weights when considering a particular company's MQM are both the domicile and industry of the firm. A generic MQM may have some factors that do not change by industry (information type and visual tools, for example) whilst others (themes, perhaps) are seen as more vital for those companies perceived to have a higher environmental impact. Environmental information provided by companies provides just part of the voluntary disclosure provided by companies and the approaches being developed here could be applied to other sections of an AR.

In looking at how preparers and users assess the quality of a company's environmental reporting, the questionnaire respondents emphasised the importance of the non-volume elements of content and the credibility gained from applying external standards and using an external examiner. The little we know about quality includes that it is influenced by more than one characteristic of the information provided, hence the desirability to produce a multi-dimensional model with the weights assigned by preparers and/or users rather than academics. Such a model can inform the preparer of where their disclosure may be falling short of normal large corporates and users of which companies appear to understand and be responsive to user needs.

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References

- Al-Tuwaijri, S., Christensen, T. and Hughes, K. (2004), "The relations among environmental disclosure, environmental performance, and economic performance: a simultaneous equations approach", *Accounting, Organizations and Society*, Vol. 29 No. 5-6, pp. 447-71.
- Beattie, V. (2014), "Accounting narratives and the narrative turn in accounting research: Issues, theory, methodology, methods and a research framework", *The British Accounting Review*, Vol. 46, pp. 111-134.
- Beattie, V. (2000), "The future of corporate reporting: a review article", *Irish Accounting Review*, Vol. 7 No. 1, pp. 1-36.
- Beattie, V., McInnes, B. and Fearnley, S. (2004), "A methodology for analysing and evaluating narratives in annual reports: a comprehensive descriptive profile and metrics for disclosure quality attributes", *Accounting Forum*, Vol. 28 No. 3, pp. 205-36.
- Bebbington, J., Russell, S. and Thomson, I. (2017), "Accounting and sustainable development: Reflections and propositions", *Critical Perspectives on Accounting*, Vol. 48, pp. 21-34.
- Beck, A., Campbell, D. and Shrive, P. (2010), "Content analysis in environmental reporting research: enrichment and rehearsal of the method in a British-German context", *The British Accounting Review*, Vol. 42 No. 3, pp. 207-22.
- Beretta, S. and Bozzolan, S. (2008), "Quality versus quantity: the case of forward-looking disclosure", *Journal of Accounting, Auditing and Finance*, Vol. 23 No. 3, pp. 333-75.
- Birkey, R., Michelon, G., Patten, D. and Deegan, C. (2016), "Does assurance on CSR reporting enhance environmental reputation? An examination in the U.S. context", *Accounting Forum*, Vol. 40, pp.143-152.
- Boesso, G. and Kumar, K. (2007), "Drivers of corporate voluntary disclosure: a framework and empirical evidence from Italy and the United States", *Accounting, Auditing and Accountability Journal*, Vol. 20 No. 2, pp. 269-96.
- BP Global (2010), Annual Report and Form 20-F, available at: <https://www.bp.com/content/dam/bp/pdf/investors/bp-annual-report-and-form-20f-2010.pdf> (accessed 15 January 2012).
- BP Global (2016), Annual Report and Form 20-F, available at: <https://www.bp.com/content/dam/bp/en/corporate/pdf/investors/bp-annual-report-and-form-20f-2016.pdf> (accessed 14 February 2017).
- Bryman, A. and Bell, E. (2015), *Business Research Methods*, 4th ed., Oxford University Press Inc., UK.
- Campbell, D. (2000), "Legitimacy theory or managerial reality construction? Corporate social disclosure in Marks and Spencer Plc corporate reports, 1969- 1997", *Accounting Forum*, Vol. 24 No. 1, pp. 80-100.

- Cho, C., Michelon, G., and Patten, D. (2012), "Impression management in sustainability reports: An empirical investigation of the use of graphs", *Accounting & the Public Interest*, Vol. 12, pp.16-37.
- Cohen, J., & Simnett, R. (2015), "CSR and assurance services: A research agenda", *Auditing: A Journal of Practice and Theory*, Vol. 34 No.1, 59- 74.
- Comyns, B. (2016), "Determinants of GHG Reporting: An Analysis of Global Oil and Gas Companies", *Journal of Business Ethics*, Vol.136, pp. 349-369.
- Comyns, B., and Figge, F. (2015), "Greenhouse gas reporting quality in the oil and gas industry: A longitudinal study using the typology of "search", "experience" and "credence" information", *Accounting, Auditing and Accountability Journal*, Vol. 28 No. 3, pp. 403-433.
- Cerf, A. (1961), *Corporate Reporting and Investment Decisions*, The University of California Press, CA, pp. 25-27.
- Cooke, T. (1989), "Disclosure in the corporate annual reports of Swedish companies", *Accounting and Business Research*, Vol. 19 No. 74, pp. 113-24.
- Cormier, D., Magnan, M. and Velthoven, B.V (2005), "Environmental disclosure quality in large German companies: economic incentives, public pressures or institutional conditions?" *European Accounting Review*, Vol. 14 No. 1, pp. 3-39.
- Daub, C. (2007), "Assessing the quality of sustainability reporting: an alternative methodological approach", *Journal of Cleaner Production*, Vol. 15 No. 1, pp. 75-85.
- David, C. (2001), "Mythmaking in annual reports", *Journal of Business and Technical Communication*, Vol. 15 No. 2, pp. 195-222.
- Deegan, C. (2017), "Twenty five years of social and environmental accounting research within Critical Perspectives of Accounting: Hits, misses and ways forward", *Critical Perspectives on Accounting*, Vol. 43, pp. 65-87.
- Diouf, D., and Boiral, O. (2017), "The quality of sustainability reports and impression management: A stakeholder perspective", *Accounting, Auditing and Accountability Journal*, Vol. 30 No. 3, pp. 643-67.
- Field, A. (2013), *Discovering statistics using IBM SPSS statistics*. Sage Publications, London.
- Francis, J., Nanda, D., and Olsson, P. (2008), "Voluntary disclosure, earnings quality, and cost of capital", *Journal of Accounting Research*, Vol. 46, No. 1, pp.53-99.
- Gallery, G., Cooper, E. and Sweeting, J. (2008), "Corporate disclosure quality: lessons from Australian companies on the impact of adopting international financial reporting standards", *Australian Accounting Review*, Vol. 18 No. 3, pp. 257-73.

Gamble, G., Hsu, K., Jackson, C. and Tollerson, C. (1996), "Environmental disclosures in annual reports: an international perspective", *The International Journal of Accounting*, Vol. 31 No. 3, pp. 293-331.

Gray, R., Kouhy, R. and Lavers, S. (1995), "Methodological themes: constructing a research database for social and environmental reporting by UK companies", *Accounting, Auditing and Accountability Journal*, Vol. 8 No. 2, pp. 78-101.

GRI (2013), Sustainability reporting guidelines (G4): reporting Principles and Standard Disclosures (Part 1). Global reporting initiatives, available at: www.globalreporting.org (accessed 10 December 2014).

Guthrie, J., Cuganesan, S. and Ward, L. (2008), "Industry specific social and environmental reporting: the Australian food and beverage industry", *Accounting Forum*, Vol. 32 No. 1, 1-15.

Hammond, K. and Miles, S. (2004), "Assessing quality assessment of corporate social reporting: UK perspectives", *Accounting Forum*, Vol. 28 No. 1, pp. 61-79.

Healy, P., Hutton, A. and Palepu, K. (1999), "Stock performance and intermediation changes surrounding sustained increases in disclosures", *Contemporary Accounting Research*, Vol. 16 No. 3, pp. 485-520.

Helfaya, A., and Kotb, A. (2016), Environmental Reporting Quality: An Analysis of Global Creditability Initiatives. In M. Erdogdu, T. Arun, & I. Ahmad, *Handbook of Research on Green Economic Development Initiatives and Strategies* (628-657). IGI Global.

Helfaya, A., and Moussa, T. (2017), "Do Board's Corporate Social Responsibility Strategy and Orientation Influence Environmental Sustainability Disclosure? UK Evidence", *Business Strategy and The Environment*, doi: 10.1002/bse.1960.

Hodge, K., Subramanian, N., and Stewart, J. (2009), "Assurance of Sustainability Reports: Impact on Report Users' Confidence and Perceptions of Information Credibility", *Australian Accounting Review*, Vol. 19 NO. 50, pp. 178- 194.

Hopkins, P. (1996), "The effect of financial statement classification of hybrid financial instruments on financial analysts stock price judgments", *Journal of Accounting Research*, Vol. 34, Supplement, pp. 33-50.

Imhoff, E. (1992), "The relation between perceived accounting quality and economic characteristics of the firm", *Journal of Accounting and Public Policy*, Vol. 11 No. 2, pp. 97-118.

Ingram, R. (1978), "An Investigation of the Information Content of (Certain) Social Responsibility Disclosures", *Journal of Accounting Research*, Vol. 16 No. 2, pp. 270-85.

Jones, M. (2011), "The nature, use and impression management of graphs in social and environmental accounting", *Accounting Forum*, Vol. 35 No. 2, pp. 75-89.

- Jones, J. and Shoemaker, P. (1994), "Accounting narratives: a review of empirical studies of content and readability", *Journal of Accounting Literature*, Vol. 13 No. , pp. 142-84.
- Kamla, R., and Roberts, C. (2010), "The global and the local: Arabian Gulf States and Imagery in annual reports", *Accounting, Auditing and Accountability Journal*, Vol. 23 No. 4, pp. 449-81.
- Kelly, J. (1993), "The effects of display format and data density on time spent reading statistics in text, tables, and graphs", *Journalism Quarterly*, Vol. 70 No. 1, pp. 140-49.
- KPMG. (2015), *KPMG international survey of corporate responsibility reporting*, KPMG Sustainability Services, Netherlands, available at: www.kpmg.com (accessed 27 March 2016).
- Lehman, G. (2017), "The language of environmental and social accounting research: The expression of beauty and truth", *Critical Perspectives on Accounting*, Vol. 44, pp. 30-41.
- Libby, R., Bloomfield, R., and Nelson, M. (2002), "Experimental research in financial accounting", *Accounting, Organizations and Society*, Vol. 27, pp. 775-810.
- Liesen, A., Hoepner, A., Patten, D., and Figge, F. (2015), "Does stakeholder pressure influence corporate GHG emissions reporting? Empirical evidence from Europe", *Accounting, Auditing and Accountability Journal*, Vol. 28 No. 7, pp. 1017-74.
- Likert, R. (2007), The Method of Constructing an Attitude Scale. In G. Maranell, *Scaling: A Sourcebook for Behavioral Scientists* (233-243). Transaction Publishers: New Jersey, USA.
- Liyanarachchi, G. (2007), "Feasibility of using student subjects in accounting experiments: a review", *Pacific Accounting Review*, Vol. 19 No. 1, pp. 47-67.
- Marston, C. and Shrivies, P. (1991), "The use of disclosure index in accounting research: a review article", *British Accounting Review*, Vol. 23 No. 3, pp. 195-210.
- Michelon, G., Pilonato, S., and Ricceri, F. (2015), "CSR reporting practices and the quality of disclosure: An empirical analysis", *Critical Perspectives on Accounting*, Vol. 33, pp. 59-78.
- Morrison, J. (2015), *Business Ethics- New Challenges in a Globalized World*. Palgrave, UK.
- Penrose, J. (2008), "Annual report graphic use: a review of the literature", *Journal of Business Communication*, Vol. 45 No. 2, pp. 158-80.
- Peters, G., and Romi, A. (2015), "The Association between Sustainability Governance Characteristics and the Assurance of Corporate Sustainability Reports", *Auditing: A Journal of Practice and Theory*, Vol. 34 No. 1, pp.163- 198.
- Rankin, M., Windsor, C., and Wahyuni, D. (2011), "An investigation of voluntary corporate greenhouse gas emissions reporting in a market governance system: Australian evidence", *Accounting, Auditing and Accountability Journal*, Vol. 24 No. 8, pp. 1037-70.

- Reverte, C. (2009), "Determinants of Corporate Social Responsibility Disclosure Ratings by Spanish Listed Firms", *Journal of Business Ethics*, Vol. 88, pp. 351-366.
- Saunders, M., Lewis, P. and Thornhill, A. (2009), *Research Methods for Business Students*, 2nd Ed., Pearson Education Limited, London.
- Schonlau, M., Fricker Jr, R. and Elliott, M. (2002), *Conducting Research Surveys via E-Mail and the Web*, Santa Monica, Canada, RAND.
- Sengupta, P. (1998), "Corporate disclosure quality and the cost of debt", *The Accounting Review*, Vol. 73 No. 4, pp. 459-74.
- Shaw, K. (2003), "Corporate disclosure quality, earnings smoothing, and earnings' timeliness", *Journal of Business Research*, Vol. 56 No. 12, pp. 1043-50.
- Smith, M. and Taffler, R. (2000), "The chairman's statement: a content analysis of discretionary narrative disclosures", *Accounting, Auditing & Accountability Journal*, Vol. 13 No. 5, pp. 624-46.
- Soper, F. and Dolphin, R. (1964), "Readability and corporate annual reports", *The Accounting Review*, Vol. 39 No. 2, pp. 358-62.
- Tauringana, V., and Chithambo, L. (2015), "The effect of DEFRA guidance on greenhouse gas disclosure", *The British Accounting Review*, Vol. 47, pp. 425-444.
- Tello, E., Hazelton, J., and Cummings, L. (2016), "Potential users' perceptions of general purpose water accounting reports", *Accounting, Auditing and Accountability Journal*, Vol. 29 No. 1, pp. 80-110.
- Toms, J. (2002), "Firm resources, quality signals and the determinants of corporate environmental reputation: some UK evidence", *British Accounting Review*, Vol. 34 No. 3, pp. 257-82.
- Trotman, K. and Bradley, G. (1981), "Association between social responsibility disclosure and characteristics of companies", *Accounting, Organizations and Society*, Vol. 6 No. 4, pp. 355-62.
- Urquiza, F., Abed, M. and Trombetta, M. (2009), "Disclosure indices design: does it make a difference?" *Spanish Accounting Review*, Vol. 12 No. 2, pp. 253-78.
- Van Staden, C.J and Hooks, J. (2007), "A comprehensive comparison of corporate environmental reporting and responsiveness", *The British Accounting Review*, Vol. 39 No. 3, pp. 197-210.
- Walden, W. and Stagliano, A. (2004), "An assessment of the quality of environmental disclosure themes", *Advances in Environmental Accounting and Management*, Vol. 2, pp. 31-57.

Watson, D. (1974), "Students as surrogates in behavioral business research: Some comments", *Accounting Review*, pp. 530-37.

Wilmshurst, T. and Frost, G. (2000), "Corporate environmental reporting: a test of legitimacy theory", *Accounting, Auditing & Accountability Journal*, Vol. 13 No. 1, pp. 10-26.

Wiseman, J. (1982), "An evaluation of environmental disclosures made in corporate annual reports", *Accounting, Organizations and Society*, Vol. 7 No. 1, pp. 53-63.

Zweig, J. (2000), "Chart burn", *Money Magazine*, Vol. 29 No. 4, pp. 67-69.