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Support for graphicacy: a review of textbooks available to accounting  
students: a teaching note

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## Support for graphicacy: a review of textbooks available to accounting students: a teaching note

### Abstract

This teaching note reports on the support available in textbooks for graphicacy that will help students understand the complexities of graphical displays. Graphical displays play a significant role in financial reporting, and studies have found evidence of measurement distortion and selection bias. To understand the complexities of graphical displays, students need a sound understanding of graphicacy and support from the textbooks available to them to develop that understanding.

The teaching note reports on a survey, which examined the textbooks available to students attending two Scottish universities. The support of critical graphicacy skills was examined in conjunction with textbook characteristics. The survey, which was not restricted to textbooks designated as required reading, examined the textbooks for content on data measurement and graphical displays.

The findings highlight a lack of support for graphicacy in the textbooks selected. The study concludes that accounting education needs to scrutinize more closely the selection of textbooks and calls for more extensive research into textbooks as a pedagogic tool.

Keywords: textbooks, accounting education, graphical displays, graphicacy

## Background

Research into annual reports, the business reporting model and financial disclosure has highlighted the role presentation formats have in disclosing accounting information. Narratives (Curtis, 1995, 1998; Smith and Taffler, 1992, 1995, 2000), images (Preston *et al.*, 1996; Graves *et al.*, 1996; McKinstry, 1996; Davison, 2004) and graphical displays (Beattie and Jones, 1999; Mather *et al.*, 1996, 2000) represent, particularly in the case of graphical displays, a significant dimension in financial disclosure management (Beattie and Jones, 1997). Studies have found evidence of measurement distortion and selection bias (Beattie and Jones, 1992b), suggesting impression management (Beattie and Jones; 1999, 2000) and legitimising behaviour (Neu *et al.*, 1998; Hooks *et al.*, 2002). Accounting information is not presented, whatever the format, in a neutral, objective fashion.

Understanding how presentation formats are used for communicating accounting information becomes particularly important for student understanding of the complexities of disclosure practices and the business-reporting model. Accounting education should therefore highlight the use of presentation formats. This teaching note focuses on the support available in textbooks found in university libraries for understanding the use of graphical displays and graphical communication. As current research has highlighted the strategic use of presentation formats and in particular graphical displays, students need support in developing their skill and knowledge bases to foster their learning and understanding.

Hill and Milner (2003) researched guidelines for constructing graphical displays in the context of financial reporting. How not to be misled by information graphically displayed and what distortions to watch out for in graphical displays, have been detailed by other studies (Jarvenpaa and Dickson, 1988; Korol, 1986; Taylor and Anderson,

1986). The powerful use of graphical displays is detailed, as well as highlighting how distorted and misleading information can be displayed. The textbook survey reported on here has been informed by these studies.

As well as guidelines for construction and possible sources of distortion, for understanding graphical displays, students should recognize that graphical displays can be highly designed presentations of data and that they can contain messages and support ideological stances (Graves *et al.*, 1996; Preston *et al.*, 1996; McKinstry, 1996; Tufte, 1983). Students must look beyond the construction of graphical displays, move beyond an expectation of correctness and appropriateness (Cleveland and McGill; 1984, 1985), and consider the message(s) the author of the display intended. As well as being complex and highly designed, studies have shown that use of graphical displays has an impact on the decision making process (Libby and Lewis, 1977; Stock and Watson, 1984; Lucas, 1981; Steinbart, 1989; Blocher *et al.*, 1986; Sullivan, 1988; Jarvenpaa and Dickson, 1988), and information systems used in decision making (Tan and Benbasat, 1993; Todd and Benbasat, 1992; Davis, 1989). Accounting education needs to consider this research and recognize that it is not just the construction of displays that is important but also an understanding of their use for communication that is important.

Graphicacy incorporates a range of skills and knowledge for understanding graphical display construction and the complexities of graphical displays (Balchin, 1972; Balchin and Coleman, 1966). Describing graphical displays as “surprisingly difficult”, Cleveland (1987) segments *graphicacy*, into graphing principles, graphical methods and perception. Graphicacy can be viewed as a suite of concepts and intellectual skills, where graphical displays are considered as “harmonious wholes” (Schmid, 1983) and where graphic thinking and graphic design are both important aspects of a display’s effectiveness (Schmid and Schmid, 1979). Shah and Hoeffner

(2002) see graphical display comprehension as a social science reasoning process, where skills as well as subject knowledge are important.

The focus of the survey is the support available to students for developing graphicacy skills and knowledge, thereby developing their understanding of graphical displays. Highlighting graphicacy recognizes how important the presentation of information is in corporate communication (Beattie and Jones, 1992a, 1992b, 1997, 1999, 2000; Mather et. al., 1996, 2000) and highlights the relevant issues accounting and business students need to examine and debate. The study extends the current literature by looking not only for research-based content in textbooks but also at other aspects of the textbooks that might affect content and therefore the support available.

By surveying the textbooks from different aspects – characteristics and content, this study has found that textbooks pay little attention to graphicacy and graphical analysis and that this lack of attention has implications for auditing, financial reporting, disclosure, and social and environmental reporting.

The following section reviews previous textbook studies, followed by a description of the current survey. The results from the survey are then presented. Finally, recommendations are considered that may help to further integrate research into business reporting with accounting education research and practice, as well as to further consider the role textbooks play in higher education.

#### Textbook Studies

Despite the use of and the role textbooks play in the pedagogic process (Brown and Guiding, 1993; Zinn and Eitzen, 1996), there have been relatively few studies investigating textbooks available to accounting students (Adelberg and Razek, 1984; Ferguson *et al.*, 2005; Ferguson *et al.*, 2006; Davidson and Baldwin, 2005). The lack of research into the use of textbooks may point to university educators being complacent

about their use, their selection, and their effectiveness as a pedagogic tool (Mitch, 1990; Kammeyer, 1988). Adelberg and Razek (1984) investigated the understandability of textbooks and were concerned (in part) with how textbooks were selected. Textbooks were selected for expediency, they found, not on the basis of any explicit criteria. Consideration of author's specialism or intended audience does not seem to be important. Aisbitt (2005) disagrees, however, and feels it is important for educators to place themselves so that they can select texts that will complement their personal or institutional pedagogy.

When textbooks used by accounting students have been investigated, the research has focussed on those textbooks designated as required reading and on matching textbook content with degree course aims and objectives (Aisbitt, 2005; Kelly and Pratt, 1994; Hopper *et al.*, 1987; Walton, 1990; Cuganesan *et al.*, 1997; Dibb and Simkin, 2003; Davidson and Baldwin, 2005; Davidson, 2005; Ferguson *et al.*, 2005).

While these studies highlight how important the content of textbooks can be for disseminating information; information on the author's origin, author's specialism, the book's target audience or level of target audience has not been reported. Ferguson *et al.* (2006) considers textbooks as cultural 'artifacts' and the product of complex social and cultural relations. Wong (1991) also considers textbooks as cultural products, so that their fundamental characteristics, i.e. author, audience or publishing are able to affect the content of or the textbook's effectiveness in disseminating information. Cameron, *et al.* (2003) studied textbook authors and how the authors' characteristics affected their writing. Authors reported they wrote with purpose, indicating that research provided the foundation for their textbook writing and that market considerations, such as students, publishers and faculty, constrained innovation in their textbook writing – an apparent clash between research led education and publishing.

Sullivan and Benke (1997) compared textbooks used by accounting students by listing their attributes. Where the book was published was considered an important feature and amongst the similarities found. Adelberg and Razek (1984) studied the understandability of textbooks, suggesting that an author's specialism or intended readership, as defined by student group or level, can contribute to a textbook's effectiveness. Yet these author characteristics or intended audience specifications have not been reported on in studies, whose main focus was examining the content.

This study extends the existing body of literature by surveying a complement of textbooks available to accounting students through their University libraries. The survey is, therefore, not restricted to required textbooks for specific courses. Higher education does carry an expectation of independent student learning and library use. Students are encouraged to read outside their required, designated textbook with the amount of source material students are expected to find is associated with their level of study (Walton, 1990). James (2000) compared the performance of students when a more traditional, wider reading approach was demanded for tax courses rather than when there was a single textbook associated with the courses. Generally, universities in the UK direct students mainly to reading lists, rather than just required textbooks in contrast to the US.

By encouraging authors to aim at as wide an audience as possible, the publishers are obviously spreading their risks. Although, previous studies have not considered information on who wrote the textbook (outside of detailing who the author is), what specialism the author had or for what target group the textbook was written for. Perhaps these characteristics can, when investigated, move towards a possible explanation of the gap detailed by Dibb and Simkin (2003). Laidler and Pallett (1998) considered good textbooks to have certain qualities, which included having a focus on the linkage(s)



between core concepts and practice rather than merely reciting concepts. Zeff (1989a, 1989b) called for textbooks to use the writings of accounting theorists or invoke the findings of accounting researchers, and asked how textbook authors have responded to the changes in financial accounting and the auspices of the business-reporting model. Textbook authors have a responsibility, therefore, to meet the demands of high quality tertiary education. If textbooks are not grounded in a research literature, he argued, textbooks and other teaching materials begin to resemble codifications of recommended practice, and accounting education programs in tertiary institutions become exercises in indoctrination. Walton (1990) called for textbooks to be grounded in a coherent explanation of their subject. Kelly and Pratt (1994), however, concluded that textbooks have failed to evolve and change by not including research based material and were, therefore, unlikely to equip students to overcome the problems involved with the practical applications.

This study examines the characteristics of textbooks that support research led teaching and analyzes those characteristics against the content on graphicacy and graphical displays, thereby extending previous studies examining textbooks in accounting education.

#### The Textbook Survey and Results

Textbooks from two major University libraries in the UK were investigated in the study. Advice was taken from the subject librarians at each of the Universities to establish which classifications or subject class marks were appropriate for selecting the textbooks. The libraries operate with different cataloguing systems; one catalogues with Library of Congress class marks, while the other library catalogues books according to its own subject classification system. Extending the survey to review relevant textbooks available to accounting students rather than restricting the study to

textbooks designated by courses as required reading adds to the literature. Although required textbooks may be considered the main pedagogic device of level one and level two courses, UK higher education encourages students to read widely and to move beyond a strict focus on required textbooks. The study has found that if students were to carry out a search with key words, suggested by the university subject librarians, such as business, accounting, quantitative methods, graphical displays, graph construction, or graphical analysis, the search would produce a range of statistics or quantitative methods textbooks across a number of disciplines on the basis of the libraries cataloguing system. Accordingly, the sample includes textbooks written for accounting and business students, as well as, health and social science students. Advanced or theoretical statistics textbooks were omitted.<sup>1</sup>

Textbooks published between 1990 and 1997 were included in the first phase of the study, while the second phase included textbooks catalogued between 1997 and 2002. This timeframe ensures that the books are in circulation and are available to students. Each sample or phase contains a unique list of books. Only the latest edition of any textbook is included in the survey. If the university libraries catalogued the same book, it is included only once, and books from the first phase of the survey were not included in the second phase of the survey, including later editions. In total 180 books were reviewed across both samples and phases; 100 books were included in the first phase and 80 were included in the second phase. The resulting sample and sampling technique ensured a comprehensive collection of source material.

Once the textbooks were selected, they were reviewed across two aspects. In the first instance, characteristics of both the author and targeted student group or level were detailed. Then content coverage on graphical displays and measurement scale was investigated. By including information on the book itself and the coverage it contains,

the study was able to explore the differences between the author's specialism or country and student target group or level with coverage of graphical displays and associated concepts. Questioning whether there is any relationship, for instance, between the author's specialism and for whom the textbook was written, investigates the textbooks in a holistic manner.

Issues supporting good graphical practice or graphicacy were used to review the context of the textbooks. A fundamental issue of the construction or analysis of a graphical display is its data appropriateness (Cleveland, 1985; Kosslyn, 1994; Tufte, 1983): matching the type of graphical display with the type of data. Graphical displays appropriate for discrete data are not necessarily appropriate for continuous data; data that is nominally scaled should be graphed differently than data that is on a ratio scale. The study surveyed textbook coverage associating data measurement scales to graphical choice, maintaining data appropriateness. If the crucial issues of measurement scale and data appropriateness are not covered in textbooks, there may be inadequate support for graphicacy and student understanding.

Table 1 presents the attributes or characteristics of the surveyed textbooks: where the textbook was written, author's specialism, and what audience the book was targeted for with respect to both level and student group. Previous studies have not detailed this information on authors or intended audience. How successful a textbook may be as a pedagogic tool could be a function of the author's intended readership or subject specialism (Adelberg and Rozek, 1984; Wong, 1991; Cameron *et al.*, 2003). The study is able to move beyond previous studies and explore whether there are any patterns between the author's specialism and whom the textbook was written for, and whether the information content varies across these characteristics.

[insert Table 1 about here]

From the Table 1 it can be seen that American authors dominate the market supplying textbooks accounting students may use for learning about graphical displays. Across the full survey, US authors wrote 54% of the textbooks, with European authors writing 3% and UK authors writing 40% of the textbooks. This pattern is seen in either the full survey or in the individual samples.

When considering the author's specialism, authors with an economics, operations research or statistics background wrote 42% of the textbooks. Authors with a health or social science specialism wrote 26% of the textbooks. This suggests that students searching university libraries by keywords would be substantially exposed to textbooks written by health or social science specialists, where accounting research may not be included. There is, however, a change over time, when the samples are reviewed separately, 36% of the textbooks in sample one were written by authors with an economics, operations research or statistics background, whereas for the second sample the proportion is 48.8%.

Across the full survey, 38.9% of the books targeted business and accounting students, while 32.2% of the books targeted health and social sciences students. Five percent of the books targeted MBA students. (Textbooks targeted at MBA students were included in the survey on the advice of the subject librarians as the key word search was developed.) The target group designation was determined by reviewing what the author or publisher indicated either in the preface or back cover information. Reviews of the individual samples reveal a shift in the target audience. In sample one, the largest proportion, 48% of the textbooks, were targeted at business students, while in sample two, the largest proportion was 46.2% targeted at general students. The number of books targeted at health and social science students fell from 37% to 26.3% across the samples. If the subject matter of the textbooks has not changed, i.e. they are

still carrying the same class marks and keywords, the clash between author and publisher may account for the change in target group.

When the target level of the intended audience was considered, there are more changes to note. Sample one showed 67% of the textbooks did not specify a student target level. Sample two, however, indicated more clearly the target level, with 46.3% of the books targeted at level one students and 37.4% of the books targeted for any level of student. The target level was determined by reading the preface, author's statement or back cover information. These developments in target level and target group are discussed in more detail later.

[Insert Table 2 about here]

Once the characteristics of the textbooks were detailed, content supporting graphicacy was examined and analysed. The results are contained in Table 2. Across the entire survey, 17.3% of the textbooks did not contain any coverage on graphical methods, graphical displays or graphical analysis. These textbooks, therefore, do not contain support for students developing graphicacy knowledge or skills. Over 63% of the books did contain part of a section or chapter discussing graphical methods or analysis, with 19.4% of the books including an entire chapter on graphical displays or graphical analysis. This result underlines the perceived *un-importance* of graphical displays and indicates how difficult it may be for students to obtain the knowledge and skills necessary for graphicacy and to fully understand the current research into the use of graphical displays for financial reporting. It also questions whether current research into the use of graphical displays and presentation formats in financial reporting is incorporated in a comprehensive manner in textbooks available to accounting students. Across the samples, there is an improvement; 13% of the sample one textbooks include a complete chapter on graphical displays and their analysis, increasing to 27.5% of the

sample two textbooks including a chapter on graphical displays and their analysis. This survey, as detailed earlier, investigated textbooks available to accounting students on the basis of advice taken from subject librarians at each university library included in the study. The textbooks investigated were catalogued by each library across a number of subject areas and disciplines. Although introductory statistics textbooks might be considered a primary source for coverage of graphical displays, it is evident that textbooks containing coverage on graphical displays and their analysis are catalogued across different areas. This result, then, on the coverage of graphical displays should be considered in that context. Investigating the coverage in introductory statistics textbooks might produce different results.

Along with the content on graphical methods, the coverage of data measurement concepts was also considered. Across the two samples, 56% of the textbooks did not include concept(s) data measurement; however, there is a difference between the two samples. 74% of the books from sample one did not contain any coverage of data measurement, while 33.7% of the books from sample two did not contain any coverage of data measurement. Overall, these results represent little support for both the fundamental concepts of data measurement and graphical displays and analysis. The change between samples could be explained by the increased use of information technology, i.e., it is easier to develop graphical displays using software, and therefore, the issues surrounding good graphing practice become more astute.

Having considered the characteristics of the textbooks and their content on graphical methods and associated concepts; relationships across the attributes or variables of interest were then explored. Table 3 explored a number of relationships and includes the corresponding Chi-Square results. Relationships 3, target group and

measurement content, and relationship 6, author country and graphical display content were not statistically significant.

The author's specialism and target group, relationship 1, produced the most significant results, and the contingency tables for this relationship were examined further. When the contingency table is examined for the entire survey, support for the expectation that authors with a business and accounting background write textbooks for accounting and business students is not found. The study shows that it is not business specialists writing textbooks for accounting students, but namely authors with a specialism in economics or operations research. Authors in the fields of statistics, economics and operations research wrote (55.9%) of the textbooks available to accounting and business students in their university libraries. Textbooks for health and social science students, on the other hand, were mainly written by authors in their own disciplines (72.3%).

[Insert Table 3 about here]

When the intended target group or audience was compared with the author's location, Relationship 4, there are significant results for the entire survey and for sample two but not for sample one. When the contingency table is examined for relationship 4, it can be seen that US authors more often write textbooks targeted at general students not accounting and business students.

Exploring the textbook characteristics further, there are other significant relationships. When target group and graphical display content are examined, Relationship 2, there are significant results for the entire survey and for sample one. When the contingency table for the full survey is examined, it can be seen that textbooks targeted at accounting, business and general students more often included graphical methods than those textbooks targeted at health and social science students.

This result, however, is dependent on combining the categories of accounting and business students with general students.

Although relationship 3, target group and measurement content, is not significant, there is a suggestive result for sample two; books targeted at health and social science students have better coverage of the relevant measurement material. When the contingency table for sample 2 is examined, books targeted at general students show more of an omission of the relevant material.

Relationship 5, also investigates the content on measurement concepts. Sample one shows more of the textbooks by US authors included content on measurement scales. This must reflect the fact that the gap in sample one, seen in Table 1, on data measurement must be attributed to UK authors. This highlights a weakness in the approach to the material amongst UK authors. Combined with the observation that the newer, general textbooks also show serious omission of content on data measurement, authors may be failing their readership. Although the level of test statistic is not strong across the full survey, we judge that the omission from the number of newer, general textbooks (48.4%) to be unacceptable cause for concern.

#### Discussion and Conclusion

This study has investigated the information content and attributes or characteristics of textbooks available to accounting students. The textbooks were examined for content on graphical displays and graphicacy in the context of the current research into the use of graphical displays for financial reporting. The study extends the existing literature as it investigated textbooks found in university libraries rather than restricting the study to textbooks designated as required reading. If students are to be encouraged to read more widely and use textbooks available in university libraries, an



examination of those textbooks is timely and relevant. The study also extends the literature by surveying textbooks for a skills-based topic.

The study found a lack of support for graphical displays or graphicacy in the textbooks available to accounting students in two main university libraries. The textbooks were selected on the advice of relevant subject librarians, and it was found that over 17% of the textbooks did not include any coverage of graphical displays. Further, 56% of the books did not contain any coverage on a fundamental concept underlying good graphing practice, i.e. data measurement. If students in the UK higher education sector are encouraged to use their libraries for extended reading, they will find it difficult, after searching their library using appropriate keywords or classification marks, to find coverage of graphical displays or support for graphicacy. With the conclusive evidence of the use and misuse of graphical displays and other presentation formats for financial reporting, this lack of coverage lays the foundation for potential knowledge and skills gap for accounting students, which should be of concern to both academics and professionals.

The study results also suggest that textbooks held by university libraries should be examined more closely. The sample of textbooks examined was a function of the selection process and the advice given by the subject librarians of the two universities impacts on the study. By design, the study did not intend to select a narrow range of textbooks, nor did it limit the survey to introductory statistics textbooks. From its start, the study intended to look at the widest range of textbooks possible while keeping the subject relevancy as advised by subject librarians, hence the inclusion of textbooks for health and social science students. The key words and subject classifications were not modified from the subject librarians' advice. The results of the study are a function of the textbooks selected, of course, and as a limitation they are not generalizable.

Issues of cataloguing aside, across the two university libraries, the total sample of relevant textbooks was 180, a smaller sample than expected. The number of university students studying business and accounting and the number of degree programmes that include business and accounting in relation to the number of relevant books deserves further consideration. Further, across the entire sample of textbooks, the university libraries catalogued 20% fewer textbooks during the second phase of the study. Not only is the total number of books lower than the authors expected, but also the reduced number over time should be considered.

The study has provided some insight into the how an author's specialism or location, and target group and target level, particularly are related to the coverage for graphical displays and analysis. These characteristics, of course, may not account for the overall lack of coverage of graphical methods but the investigation frames a research agenda and debate that needs further attention from the accounting education literature. Although answers to some of these questions may lie in the marketing strategies of publishers, why the authorship and intended audience of textbooks in conjunction with their content, has received little attention is surprising.

The study also has contributed to the debate on the expectations accounting academics have of pedagogic devices in general, if not textbooks themselves. The study did not expect to find textbooks dedicated to graphical analysis or graphicacy. It did not expect the textbooks in the relevant subject areas to be dominated by graphical analysis or graph construction. The result, however, of 17.3% of the textbooks omitting graphical analysis should be examined further. Do accounting academics, as well as textbook writers expect students to have the knowledge and skills that compose graphicacy before they start their university degrees?

The main message for accountancy educators is to examine and consider the selection of textbooks more closely and to reconsider their expectations of current accounting research being included in textbooks. Textbooks containing adequate subject examples and illustrations for students understanding of research should also be examined. Graphical displays have intent, contain messages and are constructed with purpose and with a variety of aims. If this information is not conveyed to students through application or seminar, they will not find support for their learning in the textbooks available to them implying that the skills and knowledge of graphicacy are meant to be self-taught. More crucially, it raises fundamental questions about common pedagogic devices such as textbooks for disseminating information. The challenge to improve student-understanding, textbooks, graphicacy and, ultimately, the quality of financial reporting remains.

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**Table 1**  
**Textbook Characteristics**

	Full Survey (N=180) (%)	Sample One Published 1990 - 1996 (n=100) (%)	Sample Two Published 1997 – 2002 (n=80) (%)
<b><i>Author Location</i></b>			
UK	40.0	37.0	44.0
USA	54.0	56.0	51.0
Europe and Other	3.3	2.0	5.0
Not Specified	2.7	5.0	0.0
Total	100.0	100.0	100.0
<b><i>Author Specialism</i></b>			
Economics (includes OR, Statistics)	42.0	36.0	48.8
Business (includes Accounting, Management)	12.0	16.0	7.5
Health & Social Science	26.0	25.0	27.5
Other	5.8	0.0	10.2
Not Specified	14.2	23.0	6.0
Total	100.0	100.0	100.0
<b><i>Target Group</i></b>			
Business (includes Accounting, Management)	38.9	48.0	27.5
MBA	5.0	9.0	0.0
Health & Social Science	32.2	37.0	26.3
General	20.6	1.0	46.2
<b><i>Not Specified</i></b>	3.3	5.0	0.0
Total	100.0	100.0	100.0
<b><i>Target Level</i></b>			
Year1 or Introductory	29.4	16.0	46.3
Year2 or Intermediate	8.3	2.0	16.3
Year1, Year2 or Professional <sup>1</sup>	24.4	15.0	37.4
Not Specified	37.9	67.0	0.0
Total	100.0	100.0	100.0

<sup>1</sup>Includes professional level and up to research level



**Table 2**  
**Content Coverage Of Textbooks**

On Graphical Methods				On Data Measurement			
	Full Survey (N=180) (%)	Sample One Published 1990 - 1996 (n=100) (%)	Sample Two Published 1997 - 2002 (n=80) (%)		Full Survey (N=180) (%)	Sample One Published 1990 - 1996 (n=100) (%)	Sample Two Published 1997 - 2002 (n=80) (%)
<b>A Full Chapter</b>	19.4	13.0	27.5	<b>A Full Chapter</b>	2.2	0.0	5.0
<b>Section in a chapter only</b>	63.3	70.0	55.0	<b>Section in a chapter only</b>	41.7	26.0	61.3
<b>Books Without</b>	<b>17.3</b>	<b>17.0</b>	<b>17.5</b>	<b>Books without</b>	<b>56.1</b>	<b>74.0</b>	<b>33.7</b>
<b>Total</b>	100.0	100.0	100.0	<b>Total</b>	100.0	100.0	100.0

**Table 3 – Relationships between Textbook Characteristics and Content Coverage**

	Full Survey (N=180) Chi-Square Statistic (p-value)	Sample One Published 1990 - 1996 (n=100) Chi-Square Statistic (p-value)	Sample Two Published 1997 – 2002 (n=80) Chi-Square Statistic (p-value)
<p><b>1. Target Group and Author Specialism</b></p> <p>Books targeted at accounting or business students are more often written by Statistics, Economics or OR Authors; Health &amp; Social Science authors more often write books targeted at Health &amp; Social Science students.</p>	71.80** (.000)  (n=141)	54.42** (.000)  (n=74)	22.53** (.000)  (n=67)
<p><b>2. Target Group and Content - Graphical Displays</b></p> <p>Books targeted at accounting, business &amp; management and General students include more content on graphical displays than books targeted at Health &amp; Social Science students.</p>	10.79** (.005)  (n=174)	7.25* (.027)  (n=95)	3.60 (.165)  (n=79)
<p><b>3. Target Group and Content - Measurement</b></p> <p>Books targeted at Health &amp; Social Science students (published 1997 – 2002) include more content on measurement than books targeted at Accounting &amp; Business students. Books targeted at General students (published 1997 – 2002) include the smallest content on measurement.</p>	4.28 (.118)  (n=174)	3.73 (.155)  (n=95)	5.72 (.057)  (n=79)
<p><b>4. Target Group and Author Location</b></p> <p>US authors more often write books targeted at general students.</p>	6.57** (.037)  (n=171)	.914 (.633)  (n=92)	12.46** (.002)  (n=79)
<p><b>5. Author Location and Content - Measurement</b></p> <p>Books (published 1991 – 1996) written by US authors more often include content on measurement.</p>	1.66 (.198)  (n=175)	9.75** (.002)  (n=95)	.301 (.582)  (n=80)
<p><b>6. Author Location and Content – Graphical Displays</b></p> <p>Books (published 1997 – 2002) written by US authors include more content on graphical displays.</p>	1.20 (.274)  (n=175)	.384 (.536)  (n=95)	6.04* (.014)  (n=80)

Note: \*\*level of significance -.01 or less  
\*level of significance -.05 or less

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<sup>1</sup> A full list of the textbooks used in the study is available from the authors.