Overreliance on Mathematical Accuracy of Computer Output: An Issue for IT Educators

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ABSTRACT

The role of information technology (IT) is critical in many applications, including accounting. However research into spreadsheet errors indicates financial data emanating from computer applications may contain errors. Auditors review financial data and report, among other things, as to its mathematical accuracy. This study evaluates the reliance trainee auditors place upon IT produced financial data and their application of the concept of mathematical accuracy. Data emanating from a supposedly reliable source was intentionally prepared with mathematical errors and given to participants for evaluation. Despite exposure to concepts such as computer error and audit scepticism, a significant proportion either erroneously concluded the data was accurate and/or failed to appropriately apply the concept of mathematical accuracy. The implications for educators are significant. Basic topics such as data integrity and over-reliance upon IT generated data may need further emphasis during training programs across many disciplines, especially accountancy.

Keywords: Data Reliability, Mathematical Accuracy, Program Errors, Scepticism, Spreadsheet Errors, Testing

INTRODUCTION

The internationally recognised model of internal control ICEFR¹ (2012) highlights the importance of the information and communication component of an entity’s internal controls. Both in the preparation of financial statements and in their subsequent review, the role of information technology (IT) is critical. Irrespective of the size of an organisation, most accounting functions are now fully computerised. However research demonstrates that information obtained from IT processing is not always error free. Significant errors can occur due to incorrect programming, inputting, converting or even during the outputting of data. IT error issues can arise at any point in an organisation’s processing, from primary or centralized data

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source points right down to data extraction or re-entry points. Jenne (1996) notes how programs can be developed and implemented with errors embedded therein, due to the increase in end-user applications. These applications have their advantages but can result in non-IT staff creating programs. As a result, standards for software development, testing, and control are not always applied appropriately and errors can ensue. Caulkins et al. (2007) note the prevalence of errors in spreadsheet environments (just one subset of overall information technology environments) and their subsequent impact upon decision making.

It follows therefore that accounting education programs, particularly in the IT area, should be aware of these issues. Elliott (2002) noted how every aspect of the accounting profession is affected by advances in IT. Hence training of future IT users in an accounting/auditing context should be viewed as a critical issue.

Auditors, both internal and external, are there to provide assurance that the information prepared by an entity is reliable (Arens et al. 2011). International auditing standards issued by the International Federation of Accountants (IFAC, 2012) decree auditors shall gather sufficient appropriate evidence to form their opinion. This makes it incumbent upon them to verify, along with everything else, the mathematical accuracy of the account balances. Essentially this concept involves verifying the additions, extensions and totals of client produced mathematical data via recalculation and/or reperformance of procedures. As mentioned above the vast majority of entity information, both financial and non-financial, is held by IT agents. This then raises the issue of how much reliance reviewers should place upon information produced by an entity’s IT system and how much testing they should do to ensure mathematical accuracy. The purpose of the current study therefore is to evaluate the perceptions of IT users as to the reliability, in relation to mathematical accuracy, of computer produced reports.

Testing mathematical accuracy is obviously significant. But during a busy degree program the possibility exists that this mundane – albeit very important – exercise may not be given the full care and attention it merits. Critics of the accounting education environment, such as Albrecht and Sack (2000) often specifically identify IT as an area where the gap between what is taught and what is needed to be taught can be an issue. Furthermore, the current generation of accounting students have predominantly been reared and educated in highly computerised environments. As a result they may be more prone to accepting what computers provide without query than their predecessors. This provides the motivation for the paper. The auditing profession in particular is currently concerned about a lack of professional scepticism. The International Auditing and Assurance Standards Board (IAASB) recently issued a Q&A Staff Bulletin (IAASB, 2012) for its members addressing the issue. Hence it is hoped this heightened awareness would imply more training in the area of appropriate evidence gathering, and not just acceptance of data presented for review.

The current study therefore takes a cohort of final year accounting students and evaluates whether or not they question the accuracy of a sample of computer output. It also tests the level to which they accept IT output as correct based on the IT environment it came from. As the experiment took place during an Auditing course, in which scepticism is an implicit component, it was predicted the students would be cautious. However, results indicated the contrary. Students appeared more than willing to rely upon the accuracy of computer output without actually testing the mathematical accuracy. There was also evidence of students not fully grasping the concept of testing for mathematical accuracy. The implications are therefore considered significant. Accounting IT educators may need to consider placing more emphasis on the critical concept of testing accuracy when designing courses. More emphasis on the risk of over-reliance on computer output may also be necessary.

Furthermore, although this study is in the confines of an accounting IT training environ-
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