



## The Future of Accounting Education with the Integration of ICT

**Nadia Rhodes**

University of Johannesburg (South Africa)

[nrhodes@uj.ac.za](mailto:nrhodes@uj.ac.za)

### Abstract

*This paper reports on the integration of information and communications technology (ICT) and the reform of accounting education that flowed from a process followed to align accounting education to accounting practice in Higher Education. A gap has been identified in the skills and knowledge of accounting diploma graduates creating a need for the integration of ICT and accounting education to close this gap. The implementation process that was followed highlighted how the teaching and learning methods would have had to evolve to accommodate ICTs in accounting education. Firstly, the iterative cycles of design-based research is argued to increase the contribution to the reform of accounting education. Secondly, the article clarifies and verifies the alignment process that was effected. The methodology followed in design-based research with the infusion of cultural-historical activity theory is argued to effect a plan that is practical and feasible for implementation. A planned series of interventions for the staff in the department to augment this alignment process is argued to be one of the necessary steps for closing the gap in the accounting graduates' skills and knowledge as needed in the workplace. Lastly, it is argued that the design principles that emanated from the findings will in future sustain a process of evolution in accounting education and can be applied as standalone principles or in any combination to work together as a process for the management of change. In conclusion, the implementation plan has been identified as an imperative architect for the augmentation of design principles that will sustain the evolution of accounting education for the diploma students.*

### 1. Introduction

Accounting education has not evolved to the extent required by industry itself. This lag created a gap in the knowledge and skills of accounting graduates as they move forward into a professional environment. The accounting industry and the job description of financial specialists have evolved to include a greater reliance on technology [8, 14 and 11]. However, in a study of the information and communication technologies (ICT) education offered to accounting students at South African universities in 2007, Wessels [14] found that students had limited exposure to the use of accounting software packages. The identified gap led to an examination, undertaken by Rhodes [11] to address the gap between accounting practice and accounting education in the higher education arena. Addressing the gap included the integration of information and communication technologies (ICT) into accounting education [11]; thereby better aligning accounting education to the requirements of the workplace. The alignment of accounting education and accounting practice will bring the accounting graduate and the employer into alignment. This alignment should be possible if the use and understanding of accounting software packages were to be integrated into the entire learning experience for the accounting diploma student – and this would need to happen throughout their studies. The integration throughout their studies could result into a more holistic learning experience matching the dynamics of the workplace.

The closure of the identified gap in the skills and knowledge of accounting diploma graduates created a need for the integration of ICT and accounting education. The implementation process that was followed highlighted how the teaching and learning methods would have had to evolve to accommodate ICTs in accounting education. The iterative cycles of design-based research with the infusion of cultural and historical activity theory highlighted a plan that was practical and feasible for implementation. The implementation plan has led to the reform of accounting education for the diploma students at the University of Johannesburg in South Africa.

### 2. Design-based research and iterative cycles

Design-based research (DBR) formed the basis of this qualitative enquiry and was framed by cultural-historical activity theory. DRB characteristics had an essential supportive and validating role and



seemed to offer the essential elements to implement a meaningful process of curriculum transformation and acted as a gateway to positioning ICT in accounting education [12]. DBR also supported the notion of the methodological issue of 'goodness of fit' [7, 9 and 4].

Cultural-historical activity theory (CHAT) has been identified as a road map for the alignment of an educational environment to the practical environment of practice, as well as demonstrating the potential to overcome challenges in educational theory and practice [13]. The design of the intervention for the integration of accounting education and practice was framed by cultural-historical activity theory as it will be based in a complicated set of relationships between actions, tools, members, rules and a community [6]. The iterative cycles of design-based research and the infusion of the cultural-historical activity theory framework facilitated the development of the integration process to the extent that the programme was practical and feasible for implementation.

One of the focal features of design-based research (DBR) is the need to refine and inform the design through a cyclical and iterative process [1, 2, 3, 5 and 10]. The iterative cycles of DBR facilitated the authentication and refinement of data as each cycle redefined and informed the next phase. The DBR basic iterative design that Reeves [10] and Amiel and Reeves [1] proposed as development research, included four phases. An outline of the design phases and cycles are depicted in Figure 1 (below). Each cycle of feedback was filtered through the theoretical framework of CHAT. Each feedback cycle of refinement was analysed, coded and matched to [6] activity theory system.

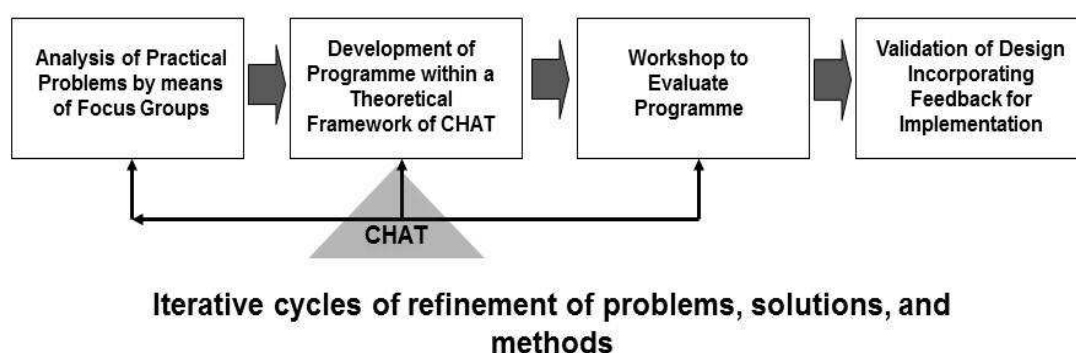


Fig 1: Outline of design phases and cycles [11]

The four main phases provided a directional map from problem identification to verification and documentation of the interventions and integration model. The phases were sequential and each phase was linked together with a cycle of informing the next phase, as well as itself being refined and validated as the study progressed. The four phases included

- the analysis of relevant issues by means of a focus group and interviews with lecturers facilitating ICT in the accounting department to analyse and inform initial design of integration programme – phase 1. The focus groups and interview were recorded, transcribed and analysed.
- the development of the programme within a theoretical framework of CHAT and consideration of a further activity system for integration of ICT and accounting education – phase 2
- three workshops with colleagues, management and industry in the diploma programme to evaluate the programme – phase 3. Feedback forms from each workshop validated the design and incorporated feedback into the design of the programme to promote implementation of the programme through their collaboration and support which were the feedback cycles of refinement and authentication
- the implementation process – phase 4. The implementation process that was followed highlighted how the teaching and learning methods would have had to evolve to accommodate ICTs in accounting education. The methodology followed in design-based research with the infusion of cultural-historical activity theory effected a plan that was practical and feasible for implementation.



### 3. Alignment process

Two innovations were proposed to bring about the alignment by means of the integration of accounting education and accounting practice. The first was the design of the planned series of interventions (PSI) engineered for the lecturing staff in the Department of Commercial Accounting at the University of Johannesburg. The second innovation was an integration model - a combination of accounting education tools and essential rules and principles represented in any accounting topic, with those same rules and principles which govern any accounting software. The planned series of interventions (PSI) and the integration model originated from separate designs and innovations, but are totally interdependent for the integration process to succeed. The systematic process to close the gap between accounting education and the practice of accounting was effected upon implementation of the PSI and the integration model. There were four distinct elements in the implementation plan.

The first element was as the process started when the opportunity to close the identified gap was acknowledged and seized. The PSI, which is the second element, was designed to facilitate the procedure, commencing with the staff and management buy-in to the final PSI, in which the staff were re-skilled on the integration of the accounting knowledge and software. Three concerns were identified by the staff during the process: lack of ability to align their pedagogy knowledge to the integrated environment; lack of support in the computer laboratories; and the lack of confidence in the teaching environment of the computer laboratories. The staff members were required to pass accounting software assessments, as well as provide evidence of their application of their new skills on the accounting software package. ICT staff and student tutors were trained to support the staff in the computer laboratories and they were required to train the tutors in the computer laboratories to gain confidence in this new teaching environment. It was necessary to work through the integration model, which is the third element, to incorporate the accounting software skills with the lecturers' accounting knowledge for the development of new pedagogical knowledge and skills. The implementation, the fourth element, of a new integrated curriculum for all three years of the diploma would then make it possible to prepare the accounting diploma graduates for the workplace. This would in turn create the potential for 'star' graduates that are work-ready – in the sense that they are sufficiently equipped with integrated knowledge and skills towards becoming 'value-creators' in the workplace (as depicted in Figure 2).

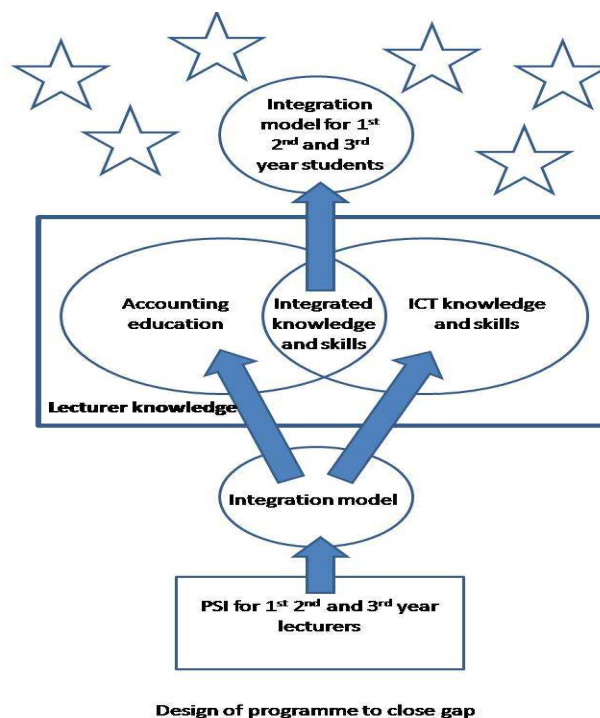


Fig 2: Design of programme to close identified gap [11]



#### 4. Design principles

In the search for solutions to the questions of what, why, how, where and when the identified gap in accounting education could be closed, concepts and principles emerged. The recognition of the design principles can be linked to the development of strands or threads of knowledge that can be woven together to form a tapestry of a process for the management of change. It was demonstrated in this study that these design principles, when woven together, formed a process that was practical and feasible for implementation. Design principles emanated from each of the four stages of the implementation which were the gap identification and verification, the integration model, the planned series of interventions and the practical implementation plan.

#### 5. Conclusion

In response to the recognition of a gap in the knowledge and skills of accounting graduates in the higher education arena, the process of curriculum change necessary for the alignment of accounting education and accounting practice are elucidated. Design-based research (DBR) and cultural-historical activity theory (CHAT) in accounting education facilitated the design of this study. The process to close the recognised gap is argued to have been developed and sustained through the infusion of DBR and CHAT. The conceptualisation of design principles was drawn from the iterative cycles of findings and lessons learnt in the implementation of the process. The design principles developed and distilled from the findings displayed generic properties that could be applied to other educational environments and in turn enhance a procedure of curriculum change and sustain a process for the management of change. The process of addressing the identified gap in accounting in higher education was implemented in 2011 when the extent of the gap and the value in closing the gap was recognised. The alignment of accounting education and accounting practice could bring the accounting graduate and employer into alignment thereby adding value to the graduates of 2013.

#### References

- [1] Amiel, T. and T. C. Reeves. (2008). Design-based research and educational technology: Rethinking technology and the research agenda. *Educational Technology & Society* 11(4): 29--40.
- [2] Barab, S. and A. J. Arici. (2005). Eat your vegetables and do your homework: A design-based investigation of enjoyment and meaning in learning. *Educational Technology*: 15--21.
- [3] Barab, S. and K. Squire. (2004). Design-based research: Putting a stake in the Ground. *The Journal of Learning Sciences* 13(1): 1--14.
- [4] Denzin, N. K. and Y. S. Lincoln. (2003). *The landscape of qualitative research: Theories and issues*. Second edition. Thousand Oaks: Sage Publications, Inc.
- [5] Design Based Research Collective. (2003). Design-based research: An emerging paradigm for educational inquiry. *Educational Researcher* 32(1): 5--8.
- [6] Engeström, Y. (1999). Activity theory and individual and social transformation. In *Perspectives on activity theory*, eds. Y. Engeström, R. Miettinen and R. Punamäki, 19--38. Cambridge: Cambridge University Press.
- [7] Henning, E., S. Gravett and W. van Rensburg. (2005). *Finding your way in qualitative research*. Pretoria: Van Schaik Publishers.
- [8] Johnson, L. M. and V. E. Johnson. (1995). Help wanted -- Accountant: What the Classifieds say about employers' expectations. *Journal of Education for Business* 70(3): 130--134.
- [9] Merriam, S. B. (2009). *Qualitative Research. A guide to design and implementation*. San Francisco: Jossey-Bass.
- [10] Reeves, T. C. (2000). Enhancing the worth of instructional technology research through 'design experiments' and other development research strategies. Symposium on international perspectives on instructional technology research for the 21st century. New Orleans, LA, USA.
- [11] Rhodes, N. (2012). Transforming accounting education: Closing the gap between technology, education and accounting in higher education institutions. Ph.D. thesis. University of Johannesburg.
- [12] Rhodes, N. (2012a). Gateways to positioning information and communication technology in accounting education. *South African Journal of Higher Education* 26(2) 300--315
- [13] Roth, W. M. and Y. L. Lee. (2007). 'Vygotsky's neglected legacy': Cultural-historical activity theory.



*Review of Educational Research* 77(2): 186--232.

- [14] Wessels, P. L. (2007). An analysis of the current IT education offered to accounting students at South African universities. *South African Journal of Accounting Research* 21(1): 103--126.