



Bridging the qualitative–quantitative divide: Experiences from conducting a mixed methods evaluation in the RUCAS programme



Vassilios Makrakis*, Nelly Kostoulas-Makrakis

University of Crete, 74100 Rethymnon, Crete, Greece

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ABSTRACT

Quantitative and qualitative approaches to planning and evaluation in education for sustainable development have often been treated by practitioners from a single research paradigm. This paper discusses the utility of mixed method evaluation designs which integrate qualitative and quantitative data through a sequential transformative process. Sequential mixed method data collection strategies involve collecting data in an iterative process whereby data collected in one phase contribute to data collected in the next. This is done through examples from a programme addressing the 'Reorientation of University Curricula to Address Sustainability (RUCAS): A European Commission Tempus-funded Programme'. It is argued that the two approaches are complementary and that there are significant gains from combining both. Using methods from both research paradigms does not, however, mean that the inherent differences among epistemologies and methodologies should be neglected. Based on this experience, it is recommended that using a sequential transformative mixed method evaluation can produce more robust results than could be accomplished using a single approach in programme planning and evaluation focussed on education for sustainable development.

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1. Introduction

In the last decades, rapid socio-economic growth has resulted in considerable improvements in health, education, and the quality of life worldwide, especially in economically-advanced countries. However, it has become evident that the world, over these decades, has experienced an unsustainable path of socio-economic development manifested by enormous and unprecedented environmental, social and economic crises. These include increased economic disparities, global poverty and hunger, deterioration of the natural ecosystems, global climate changes and the violation of human rights, etc. International entities and NGOs (Non-Governmental Organisations) have raised voices and concerns that this unsustainable path has to be reversed if planet Earth is to survive (Mader, 2013). It is widely agreed that becoming sustainable requires a change in our value-systems, attitudes and behaviours which have driven the planet to the current unsustainable state. The sustainability crisis our world is facing is deeply rooted in the way we are treating the natural and human environment. Consequently, it is a crisis of values and of our value-systems which are driving our

actions towards a non-sustainable society. This inevitably raises the issue of sustainability ethics that concerns human beings' ethical relationship with their natural and social environment. In this context, a fundamental question that can be addressed is: what are our responsibilities with respect to the environment and society, and why? Lynn (2015, p. 191) discusses that science alone cannot speak to the origin of such a crisis that is impoverishing both humanity and nature, since "its origin lies in a deeply rooted cultural conflict over our coexistence with other forms and ways of life".

The urgent need to take action to reverse the sustainability crisis has continuously been addressed by the concept of sustainable development over the last two decades. This calls for HEIs (Higher Education Institutions) to play a critical role in building a more sustainable society. However, "to fulfil this role at the regional, national and international levels, higher education institutions themselves have to undergo critical transformation towards sustainable development in their philosophy and practices and put in place quality assurance systems to ensure that this transformation is consistently implemented and effective" (Fadeeva, Galkute, Mader, & Scott, 2014, p. 1).

A question which challenges academics and decision-makers in higher education is: what sort of teaching, learning and curricula will students need to meet the profound social, environmental, economic and political challenges of the 21st century? Sterling

* Corresponding author.

E-mail address: makrakis@edc.uoc.gr (V. Makrakis).

(2008) considers this as a critical and important question, but it should be further asked: what changes, and what learning need to take place amongst various stakeholders, so that education itself can be more transformative and appropriate to current times? HEIs have a responsibility to respond to this need and to equip their students with the competencies and capacities which enable them to transform themselves and society towards the path of sustainability. It is not only the paradigm of development that needs to be changed to achieve sustainability, but also that the paradigm of education has to be transformed. Indeed, the great challenge of the 21st century for institutions of higher learning is to transform them as sustainable universities capable to function as agents of change (Makrakis, 2014). The task of transforming Higher Education teaching, learning and curricula for educating students to function as agents of change is of most critical importance and priority. It appears that the call to serve as sustainability change agents demands HEIs to change almost every aspect of their functions. While HEIs are expected to play a critical role in promoting sustainable development, there is a growing consensus that our current paradigms of teaching, learning, curriculum and research are inadequate for addressing the long term needs of a sustainable future (Makrakis & Kostoulas-Makrakis, 2013a, 2013b). These inadequacies hinder attempts at planning and evaluating programmes that concern the re-orientation of university curricula to address sustainability. There is thus a need to question the dichotomy of quantitative–qualitative research and advance transformative conceptions of teaching, learning and curriculum.

2. Questioning the dichotomy of quantitative and qualitative research

The general tendency is to divide research methods into quantitative and qualitative types. The quantitative type is driven by a positivist and objectivist philosophy, and the qualitative type by a phenomenological, social-constructivist, inter-subjectivist and interpretivist philosophy. The qualitative conceptualisation of research implies an emphasis on processes and meanings that are differently defined or not measured under controlled conditions.

Those following qualitative research methodologies emphasise the socially-constructed nature of reality, holism, exploration, flexibility, meaning-making and understanding. In contrast, the quantitative conceptualisation of research implies an emphasis on measurement, testing of hypotheses and analysis of causal relationships between variables, value-free prediction and generalisation.

During the last decade, there has been a continuous debate about going beyond the rhetoric of differences among epistemologies and methodologies in research, and there are increasing calls for mixing rival paradigms rather than adhering to the tenets of a single methodological approach. Instead of either ignoring or defending particular research paradigms, it is possible and more fruitful to see both qualitative and quantitative paradigms as part of a continuum and not as polar opposites (Hall, 2012; Harrits, 2011).

Mixed methods research has been established as a third methodological movement over the past twenty years, complementing the existing traditions of quantitative and qualitative movements (Bergmann, 2011; Molina-Azorín & Cameron, 2010; Tashakkori & Teddlie, 2003; Walsh, 2012). The term 'mixed methods' has since developed and refers to research utilising two or more methods and yielding both qualitative and quantitative data (Creswell and Plano-Clark, 2007; Driscoll, Appiah-Yeboah, Salib, & Rupert, 2007; Greene, 2007). Researchers who reject methodological monism and adopt a more pragmatic stance argue that it is not contradictory to use research methods from rival

paradigms (Hall, 2012; Harrits, 2011; Johnson & Onwuegbuzie, 2004; Morgan, 2007).

Despite calls for merging quantitative and qualitative research in studies on ESD (education for sustainable development), the use of mixed methods has rarely been practised in this field. In ESD, quantitative measurements have limitations in that they offer numerical data to represent the complexities of re-orienting university curricula to address sustainability, while qualitative methods may provide a deeper and more contextualised description of the complexities encountered in the reorientation process. To understand and to capture the diversity and complexity of sustainability, a wide range of data must be collected combining various research methods and sources. Thus, integrating quantitative and qualitative methods present a comprehensive portrayal of re-orienting university curricula to address sustainability. Using a combination of qualitative and quantitative research can minimise the weaknesses of each research tradition and balance their strengths. However, our viewpoint is that quantitative and qualitative approaches can be mixed, but their philosophical differences and the consequent implications for research and policy must be made clear. It is important to emphasise that researchers who adopt mixed method stances should be clear about what kind of world they are aiming for. This is very critical in issues dealing with sustainable development as ethics and values cannot, and should not, be considered apart from teaching, learning and the curriculum.

3. The RUCAS conception of teaching, learning and curriculum

3.1. What is RUCAS approach?

The RUCAS (Reorient University Curricula to Address Sustainability) was a three-year European Commission Tempus-funded project (2010–2013) consisting of 12 partners, led by the University of Crete, initiated and co-ordinated by Professor Vassilios Makrakis, Chairholder of the UNESCO Chair, ICT in ESD. This project generated a wide range of activities to develop resources, revise and develop new curriculum initiatives, build capacity and strengthen national and regional networks. More specifically, the project aimed to: (1) review and revise undergraduate curricula to address ESD in the national/regional prioritised disciplines in the Higher Education sector in Egypt, Jordan and Lebanon; (2) build capacity amongst university staff to embed ESD; and (3) institutionalise and disseminate ESD curriculum reform. The project was thus targeted at students, teaching staff and high rank administrators at the partner universities and in academic disciplines such as: educational sciences, applied sciences, social sciences, engineering, agricultural sciences, political sciences, as well as business and economics.

RUCAS was driven by competence frameworks and skills identified as critical for the 21st century and to provide a useful context for embedding sustainability in teaching, learning and the curriculum. The *Delors' Report* (1996) marked the beginning of UNESCO's 21st century competence learning discourse – with learning to know, learning to do, learning to be, and learning to live together – forming the four pillars of learning. At a later stage, the 5th pillar of learning 'to transform oneself and society' was added by UNESCO. We are of the opinion that a 6th pillar of 'learning to give and share' need to be added in order to respond to the quest for merging volunteerism, social activism and learning. This new pillar complements well with the others as it identifies the need to introduce in the learning process the concepts of giving, sharing, caring, feeling, justice and equity in order to help learners understand the importance of common good and civic co-responsibility (Fig. 1).

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