ACTION RESEARCH AS A QUALITATIVE RESEARCH APPROACH FOR UNDERSTANDING TECHNOLOGY PROFESSIONAL DEVELOPMENT IN HIGHER EDUCATION

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Abstract
Over the last two decades, institutions for higher education such as universities and colleges have rapidly expanded and as a result have experienced profound changes in processes of research and organization. However, the rapid expansion and change has fuelled concerns about issues such as educators’ technology professional development. Despite the educational value of emerging technologies in schools, the introduction has not yet enjoyed much success. Effective use of information and communication technologies requires a substantial change in pedagogical practice. Traditional training and learning approaches cannot cope with the rising demand on educators to make use of innovative technologies in their teaching. As a result, educational institutions as well as the public are more and more aware of the need for adequate technology professional development. The focus of this paper is to look at action research as a qualitative research methodology for studying technology professional development in HE in order to improve teaching and learning with ICTs at the tertiary level. The data discussed in this paper have been drawn from a cross institutional setting at Fontys University of Applied Sciences, The Netherlands. The data were collected and analysed according to a qualitative approach.

Keywords: Professional development, technology, action research.

1 INTRODUCTION
It is generally acknowledged that technology, demography, governmental policies and economic factors are the key drivers for change [1, 2, 3]. However, the rapid expansion and change of higher education (HE) has fuelled concerns about the maintenance of academic quality such as issues of educators’ technology professional development (TPD).

Despite the potential benefits of information and communication technologies (ICTs) in HE, the introduction of emerging technologies within schools has not yet enjoyed much success [4, 5, 6]. Several factors have contributed to the lack of adequate use of ICTs in the classroom. Somekh [7] argues that the low levels or inadequate use of ICTs in schools is due to the complexities of the classroom environment. Cuban [8] argues that little has changed since the fundamental goals and understandings of education have not changed. These findings are supported by Cox [9; 90], who claims that effective use of ICTs requires a substantial change in pedagogical practice. Consequently, educators’ traditional professional development needs to be changed in structure as well as in content.

While much of the current drive underpinning the integration of ICTs in HE rests on the belief that emerging technologies “can promote and support a more student-centred environment, teachers existing pedagogical approaches tend to determine use” [10; 1]. Traditional training and learning approaches cannot cope with the rising demand on educators to make use of innovative technologies in their teaching [11]. The superficial use of emerging technologies in education has raised questions with regard to its effectiveness. As a result, educational institutions as well as the public are more and more aware of the need for adequate TPD “to ensure pedagogical sound teaching use in the classroom” [12; 284].

Consideration of action research as a strategy for studying TPD in the higher education sector is the focus. Within the context of changing conditions of HE, this paper points out how action research as a qualitative research methodology could be effective for studying TPD in order to improve teaching and learning with information and communication technologies at the tertiary level. Several distinct bodies of literature on TPD and action research are discussed.
2 CHANGING CONDITIONS IN HIGHER EDUCATION

Higher education (HE), in the Netherlands, and globally, has and is changing radically — there are more (international) students, more different forms of institutions of higher education, “less resources and increasing debates around ‘standards’ and ‘effectiveness’” [13; 1]. With the advent of a global technology economy “the economic importance of education has been rediscovered” [13; 2]. Educators are expected to be able to facilitate learning in a meaningful way and the use of emerging technologies has provided new means and possibilities to bring the new learning to meaningful educational applications in the classroom. However, educators have realised that the use of technology in the classroom does not immediately result in innovative educational practices. Learning to cope with these technologies for educational purposes is for most educators a complex process. As a result, educators have specific needs with regard to the learning of emerging technologies.

Technology professional development (TPD) has become a focus of attention in HE, but much of the attention has been dominated by an international discourse and ‘a surface learning’ about teaching [14]. Numerous publications about the use of ICTs, in teaching and learning provide educators with useful concepts and ideas [15, 16, 17]. However, most of these publications fall short of addressing the issues concerning how to best conduct TPD.

“New [technology] professionalism” [18; 15] includes a “renewed commitment to building a learning profession focussing on the quality of practices in a context” [19; 12]. Consequently, educators engage in critical reflective processes, and consider new views as they learn new knowledge bases and skills so as how to best apply ICTs to teaching and learning.

Reconstructing professionalism requires an adequate research approach in the study of TPD. As a result, action research as a qualitative research methodology seems to be an academically legitimate methodology. Action research attempts to merge theory and practices producing relevant findings that contribute to a better understanding of TPD. Since action research as a qualitative methodology involves the collaboration of researchers, educators and other participants, a thorough understanding of its techniques and implications is essential to everyone who is engaged in the study of TPD in HE.

3 KEYWORDS AND DEFINITIONS

A key question for this paper has been outlined: whether action research can be used as a qualitative approach for studying TPD. Learning to use new technologies in their classroom is for most educators very intimidating and frustrating. However, looking at educators’ TPD as much more than technology training will provide “recommendations for TPD efforts that will not only transform educators’ perspectives but also their practices” [12; 295].

Before proceeding, it is necessary to discuss some of the key terms that are used in action research discourses and which are related to this paper. Definitions with regard to what is action research “reflect wide disagreement on many key issues” [20; 3]. Kemmis and McTaggart define action research as:

A form of collective self-reflective inquiry undertaken by participants in social situations in order to improve the rationality and justice of their own social or educational practices, as well as their understanding of these practices and situations in which these practices are carried out. Groups of participants can be teachers, students, principals, parents, and other community members—any group with a shared concern. [21; 6]

Both researchers, writing about the educational context, add the goal of ‘social justice’ to their definition. McKernan is less context focused in his definition and defines action research as “a form of self-reflective problem solving, which enables practitioners to better understand and solve pressing problems in social settings” [22; 6]. McCutcheon and Jung define action research as:

A systemic inquiry that is collective, critical and undertaken by participants in the inquiry. The goals of such research are the understanding of practice and the articulation of a rationale or philosophy of practice in order to improve practice. [23; 148]

Argyris and Schön focus on the professional, organisational and methodological aspects of action research.
Action research takes its cues — its questions, puzzles, and problems — from the perceptions of practitioners within particular, local practice contexts. It bounds episodes of research according to the boundaries of the local context. It builds descriptions and theories within the practice context itself, and tests them through intervention experiments ... [24; 86]

Examining the above definitions and identifying commonalities and differences suggest the following: Action research is referred to as a term, a process and an enquiry. Action research is carried out by different participants such as researchers, educators and other participants who critically reflect on the process in order to better understand and improve the given problem in a social setting. Within the context of this paper “educational action research is an enquiry which is carried out in order to understand, to evaluate and then to change, in order to improve some educational practice” [25; 93].

4 PHILISOPHICAL ISSUES

In most textbooks about research methodologies, “it is qualitative and quantitative research that are set against each other as polar opposites” [26; 15]. This distinction occurs at the level of methods and certainly not at the level of epistemology or theoretical perspectives. Crotty [26] makes a distinction between objectivist / positivist research and constructionist or subjectivist research. However, he suggests that the traditional division — objectivist research which is commonly associated with quantitative research methods over against constructionist or subjectivist research methods — is not academically justified. Many research methods which are considered today as forms of qualitative research used to be carried out in “an empiricist, positivist manner” [26; 15]. On the other hand, Crotty emphasizes that “quantification is by no means ruled out within non-positivist research” [26; 15] and adds to this that:

We should accept that, whatever research we engage in, it is possible for either qualitative methods or quantitative methods, or both, to serve our purposes. Our research can be qualitative or quantitative, or both, without this being in any way problematic. [26; 15]

Social science is, due to the great variations of human behaviour, a dynamic discipline. However, over the years, the main form of social science research has been qualitative research which has been a remnant of positivism as a theoretical perspective during the second half of the 20th century. The scientific streaming was “based on the doctrine of non-normative or value free science” [27; 13]. In fact, the mainstream research in social sciences has been for a long time theory-oriented, “characterised by the production of knowledge for knowledge’s sake” [27; 9]. Although mainstream research in the social sciences is theory-oriented, there has always been a debate about the practical relevance of science. Since the 1980s this debate has taken place under the heading of utilization of knowledge [27; 11]. Shadish et al [28] point out that there is a tendency towards an instrumental use of scientific knowledge due to a rise in practice and competence-oriented disciplines in science. As a result, the demand of utility has risen and has gained more and more significance as a quality criterion for doing research. Verschuren states that this demand of utility in the settled social sciences is part of the “scolarization of society” [27; 11]. Mahotra Bentz explains the scolarization in society as follows:

As work in advanced industrial society has become more knowledge-based, social and human science research has moved farther out of the exclusive domain of academia into the world of work and business. [29; 4]

Practice-oriented research such as action research, which belongs to the second domain of social sciences, mainly focuses on “knowledge for change” [27; 9] and meets the criterion of utility. Action research is about “improving education and, at the same time, contributing to knowledge” [30; 3]. According to Bassey, action research “lays stress on the uniqueness of each research situation — on the study of singularity — rather than emphasizing the notion of a generalizable theory” [25; 111]. However, Furlong and Oancea [31] suggest that action research as a practice-oriented research methodology offers arguments against the idea that applied research is only concerned with practice and cannot contribute to theoretical knowledge production. Whitehead [32] argues in a similar vein for the relevance of action research in educational contexts. He describes education in general as a value laden activity where the term ‘value’ refers to qualities that make sense to our personal and professional lives [30; 4]. Whitehead [32] suggests that when educators ask themselves in what way they can improve their practices, they can embody their own educational values. He refers to this approach as ‘living educational theory’.
5 UNDERSTANDING ACTION RESEARCH

Many scholars [20, 33] view the origins of action research as being the work of Kurt Lewin [34], who developed the methodology in the aftermath of World War II. Lewin believed that knowledge can be developed from problem solving in authentic situations. In order to understand a situation or problem in a real-life situation, “we need to change it” [35; 34]. Lawler states that this ‘change’ can be analysed on the basis of “two interrelated questions: What does it take to change a given system [situation or problem]; and how does this process of change develop our knowledge about the system?” [36; 5]. Within this context, action research is a qualitative method for understanding and improving that particular system or situation.

Action research will typically go through a spiral of action cycles. Blum [37] describes the action research process as a simple two stage process. The first stage is a diagnostic stage which involves a collaborative analysis of the situation or problem that is carried out by the researcher practitioner. The second stage involves a therapeutic approach and consists of a set of change experiments. During that stage the efforts of the changes will be studied. However, according to Carr & Kemmis [38; 186] an action research project is not confined to two stages but constitutes a spiral of four stages: 1) planning action; 2) implementing action steps based on the plan; 3) observing the effects of action in the given research context; 4) reflecting on the effects as a basis for a new phase of planning, acting and so on. In other words, “the cycle of activities forms an action research cycle in which each cycle increases the researchers and practitioners’ knowledge of the original puzzle or problem and, it is hoped, leads to its solution” [20; 5].

Defining action research as a coherent methodology is a difficult task. It is therefore more accurate to consider action research as a ‘meta-methodology’ [39] — it certainly is an interventionist approach with an emphasis on change and collaboration. Reason and Bradbury [40] emphasize the construction of knowledge through collaborative activities which they consider as an “educative imperative” (p.16). Also, significantly, action researchers such as Carr and Kemmis see “the development of theory or understanding as a by-product of the improvement of real situations, rather than application as a by-product of advances in ‘pure’ theory” [38; 28]. In other words, Carr and Kemmis emphasize the fact that knowledge is built through change and consider the knowledge and theory generated during the research process as “appropriate to the context and its participants” [36; 5].

6 CRITIQUE OF ACTION RESEARCH

During the early 1950s, it was Stephen Corey [41] among the first to use action research in the field of education, but interest was not sustained. Revival of interest and wider adoption of action research as a scientific methodology in the educational setting is largely attributed to the work of Stenhouse [42], who advanced the idea of educators as researchers. As a result of a renewed interest and several movements such as the Teacher-as-Researcher Movement in Britain during the late sixties and the Practitioner Researcher Movement in North America during the seventies, the amount of accessible research on action research in education has grown exponentially [20; 19-22]. However, a critical analysis of the literature reveals notable weaknesses of action research as a scientific research methodology by many traditional empiricists.

There is some criticism from followers of the Traditional-Empirical approach. Followers such as Lukesch and Zecha who state that the basic terms and methods of action research remain unclarified and that its objectives are characterized by “vague terms, unclarified preconditions and contradictions” [43; 40]. According to both authors, action research “cannot be considered a new research strategy but rather a more or less disguised method of politico-pedagogical manipulation” [43; 40]. Argyris and Schön refer to the methodological “double burden of testing hypotheses and affecting some (putatively) desired change in the situation” [24; 86]. In other words, Argyris and Schön’s “concern [is] with both action (improvement of practice, social change and the like) and research (creating valid knowledge about practice)” [24; 86]. This “sets up a conflict between the rigor and the relevance of the research …” [23; 40]. These concerns are supported by Baskerville and Wood-Harper, who claim “that some of the action research offered to the scientific community lacks rigor” [44; 240]. Both scholars make a distinction between rigorous action research and liberal action research and state that rigor relates to “fitting the research methods to the problem in order to produce valid scientific explanations” [44; 241]. Liberal action research results when researchers become too much involved in the research and as a result “neglect the scientific discipline” [44; 240]. This lack of impartiality has led to rejection of action research as a scientific research methodology.
Some of the action research lacks validity. Despite a growing acceptance and encouragement of action research within institutions of higher education, little attention has been paid so far to what counts as validity in action research. Feldman describes in his paper, “Erzberger’s Dilemma: Validity in Action Research and Science Teachers’ Need to Know” [45; 87], a group of physics teachers, who meet on a regularly basis to discuss their teaching and who like to engage in a systematic inquiry of their teaching. One of the teacher-researchers, Andria Erzberger, has repeatedly wrestled with the dilemma of validity. Erzberger wants to know whether what she is doing differently this year in her teaching is more effective than what she did in the past. However, the data that she collects based on an action research approach do not meet the warrants for validity:

“I’m one of the people who keeps asking, “Well is this really research? How do I know if my students are learning any better? How do I know if I’ve changed? How do I know if the students have changed?” Coming from a physics point of view, I keep asking, “What is the data? How do we really know if we’re doing anything better or not?” In physics we see research more as controlled experiments, variables and data, and so forth, which is not what we’re trying to do with this. [45; 87]

As a traditional empiricist, Erzberger’s training in the physical sciences has led her to conclude that she cannot have the faith in the data which she collected in class. In other words, she is aware of the multiple variables in her own teaching situation to do the sort of controlled experiment, which would satisfy her demands [45; 87]. Feldman states that Erzberger is faced with “the dilemma that she would do more than the monitor and adjust that is Schön’s (1983) reflection-in-action” [45; 87]. Feldman states that although he has singled out Erzberger’s case for the purpose of describing the dilemma of validity in action research, Erzberger’s case has not been an isolated one but applies to many researchers in the field of education.

Despite the abundance of studies in the field of action research, key questions with regard to TPD continue to be under-researched. There is a great need for adequate TPD programmes in HE. Action research can be beneficial to teacher-researchers to get a better understanding of TPD in the educational sector. According to Baskerville and Wood-Harper, the described weaknesses of action research “are actually general problems of social science research” and “is not one of poor understanding by those who review the research, but poor understanding of the method by those who conduct the research” [44; 241].

7 PROFESSIONAL PRACTICE

Education has always been the subject of much research and debate particularly when it comes to innovation required to meet up to an ever-changing society. As Sloep and Jochems [46] point out, the digital revolution, which started in the 1980s when the computer was introduced, has had an enormous impact on daily life, work and education. As has been discussed earlier due to the introduction of the computer, many institutions for education have adopted a wide range of ICTs into their educational delivery and support processes but many of these ICT projects have been evolutionary and not revolutionary. In other words, the use of ICTs has been a process of integrating emerging technologies in old and existing practices. This process has had many consequences for the ways in which we educate our own students [47]. For example, since knowledge has become more volatile, life-long learning has become increasingly important in society as well as education. At the same time, HE has been subjected to change. However, Douglas [48] notes that the use of blended models has not replaced the ubiquitous mode of delivery (the classroom) by other modes of delivery (virtual).

Schrum states that it is important “to look carefully at how educators learn about” [4; 85] ICTs, since educators are the key to education of the future. Implementing emerging technologies does by no means create an adequate change. As Collis contends, it is the educator who shapes “the eventual success or lack of any computer-in-education initiative” [49; 22]. In this context the question could be raised, is TPD an essential part of the process of transforming education of the future in HE? Researchers such as Cuban [8] and Schrum [4] have done extensive research with regard to the issue of emerging technologies and the promise that it will change learning and teaching in many respects. Unfortunately, little has changed in HE, since the fundamental goals and understandings of education have not changed to date. Bradshaw [50] emphasizes the fact that TPD is not equal to traditional types of staff development and therefore requires a significantly different approach with regard to designing technology development programmes. These findings are supported by Holland who states that staff development in technology “has relied heavily on just such in-service training”, which “is not
meeting teachers’ needs” [6; 248]. “What teachers really need to develop as professionals is help and support in integrating new knowledge and skills into their classroom practice” [6; 248].

The use of emergent technologies in HE requires another layer of consideration. Consequently, it requires educators to reconceptualise traditional educational models [51] which means that educators need compelling reasons to change their teaching and learning practice. ICTs training for educational purposes tend to be just “in case” learning instead of “just in time” learning [4; 85]. In many cases, educators’ learning styles differences are not taken into consideration in planning and organising ICTs trainings. Authentic reasons in order to create ownership “might produce educators willing to experiment with that type of program” [4; 85]. In other words, educators need to identify their needs and interests based on authentic situations and reasons so as to create a certain ownership with regard to their teaching and learning. This process of identifying needs and reasons is a prerequisite to gear adequate TPD training programmes to educators’ needs and perceived goals.

However, most of the computer training initiatives are based on an instrumental approach and are directive in nature. In this way Fontys University of Applied Sciences hopes that this sort of “learning experiences will change teachers’ practice” [52; 279] and create a willingness to use ICTs for innovative teaching and learning activities. But what educators really need in order to develop as professionals is help and support in integrating knowledge and skills into their classroom [53].

8 DOCUMENTING EDUCATORS’ EXPERIENCES

As has been described earlier, the use of emergent technologies is increasing in HE. Wikis are one such tool in the emergent technologies arsenal that has shown educational promise [54]. Wikis are websites that are editable by their users and which work:

Through the collaborative efforts of a community of people who are convened around the goals of the particular wiki, and who work to maintain and develop the context and goals of the wiki. [36; 1]

Schrand [54] points out that wikis can facilitate more active learning and that wiki technology can appeal to multiple intelligences and different learning styles which emphasize the fact that wikis have several educational benefits for motivating learners. According to Hazari and Schnorr [55], one of the most powerful elements of a wiki is the ability to engage learners in an interactive, online community. Wikis can empower learners by giving them a chance to express their own views and reflect in a critical way. Additionally, wikis can also help students to develop reflective and collaborative learning skills. “The way in which a wiki works is also echoed in the way that its community acts — ‘known as the wiki way’ — a culture of openness, sharing and collaboration” [36; 1]. Group interaction between learners draws them to a deeper level of participation and collaboration which may result in deeper knowledge building appropriate to the context and its participants [56].

Wikis are considered to be “democratic and empowering” [57; 69] as is action research [40; 76]. Action research is based upon participation, collaboration and emancipation of the individual through critical self-reflection. As a result, wikis and action research are compatible since they share key features or as Lawler points out:

I believe that action research is akin to ‘research done the wiki way’ — it is participative, collaborative, emergent, iterative, and, at all times, it is subject to the critique (and counter–critique) of anyone who cares to comment. [36; 5]

A wiki shares all these key features as well as facilitating the design, development and structuring of necessary materials to conduct research [36].

TPDWiki is a pilot study which was setup in June 2010 to provide educators, researchers and other users such as curriculum developers with a virtual space for active learning. Figure 1 is a simplified map of TPDWiki participants with varying degrees of participation and collaboration. The TPDWiki components allow for presentation of learning materials in text and rich media, synchronous and asynchronous discussion and reflection tools. Participants are able to see what others are working on and by making use of the wiki they are able to unlock knowledge and make it available for all participants of the virtual community. Moreover, instructors or researchers are able to monitor participation, collaboration and learners’ progression.
As evident from their personal interviews, educators at Fontys University of Applied Sciences indicated that the use of wikis in their TPD programmes challenged them to critically reflect on their own learning processes as well as the learning processes of others:

“The TPDWiki enables me to see what I have learned. Moreover, I can see what others know and do not know about ICT. Learning from each other, learning different things from colleagues with different kinds of expertise, helps me to critically reflect on what I learn.” (educator 1)

These experiences are supported by Reason and Bradbury, who regard action research “as a process of reflection, learning and development of critical consciousness” [49; 77].

Several colleagues, who participated in the pilot study, reported that wikis serve “and involve a diverse set of people” in which “individuals' involvement or participation can range from core to peripheral, and indeed oscillate between these poles” [36; 2]. In other words, taking part in any online community or virtual space “involves a learning dimension”, for example the way in which the virtual community works and in what way the participants communicate, interact and collaborate with each other [58]. One TPDwiki participant reported the following:

“At first I did not feel at ease giving my views or opinions about using ICTs in the classroom. After having read some of the articles which were uploaded by others, I dared to give my own view. After some time I felt comfortable to give feedback or answer questions which were posted in the forum. I felt that I became quite ICT-savvy.” (educator 2)

Elliott [59] states that action research is about changing a situation which is similar to what is happening in wikis that are in constant change. It is for this reason that wikis and action research are congruent with each other. The process of change within the wiki develops the participants' knowledge about ICTs. Wiki pages are iterative since participants who edit to a page create new and updated versions. Bruns and Humphreys state it well when they describe learning in a wiki space as “content creation in a digital environment [and] creating knowledge from tacit understanding” [60; 27]. Both authors' observations are parallel to several educators’ experiences:

“I wrote on my own page in the TPDWiki some questions with regard to how I could create my own podcasts. Several colleagues responded on the same day and gave me useful information. One colleague added a link of a Youtube film about how to create a simple podcast. Another colleague uploaded some interesting articles which explore the educational benefits of podcasts in foreign language teaching.” (educator 3)

Analysis of the literature and TPDWiki participants’ data leads to the realisation of developing adequate TPD programmes using wikis as a research method. “Wikis and action research are congruent, both epistemologically and methodologically”, this to the extent that “action research is akin to ‘research, the wiki way’” [36; p.7]. Engaging educators in an online community can promote collaboration; encourage negotiation and knowledge base creation.
9 CONCLUSION AND POINTERS FOR FURTHER RESEARCH

Educators in higher education are encouraged to practice lifelong learning by constantly enhancing their technological knowledge and skills. However, emerging technologies for educational purposes are introduced at such a rapid rate today that it is difficult for most educators to keep up. Additionally, as society and education realize the potential pedagogical benefits of emerging technologies in the classroom, educational institutions as well as the public are more and more aware of the need for appropriate TPD training in the transformation of education.

This paper examined the literature on TPD and reviewed the current status and described efforts to increase educator use of technology in appropriate ways. Consideration of action research in the higher education sector as a research methodology provides more insight and a better understanding of how to develop adequate TPD programmes for educational purposes. Action research makes it possible to engage all stakeholders – in other words, everyone who is possibly affected in the research itself. In terms of research methods, it is always possible to use different qualitative methods such as questionnaires and interviews but the use of wikis, an example of an emerging technology which has been discussed earlier, as a collaborative, discursive environment makes it possible to conduct action research. In this context, wikis emphasize the 'action' in action research since stakeholders can collaborate, construct and critically reflect in a community of practitioners. According to Lawler, "wikis and action research are congruent, both epistemologically and methodologically, to the extent that action research is akin to research, the wiki way." [36; 7].

Although literature makes clear that action research will result in improvement of professional development programmes for educators, the use of action research as a research methodology to understand TPD is a neglected area in the literature on teacher education. In other words, more research needs to be done with regard to the use of action research as a research methodology for better understanding and designing TPD programmes in HE. Systematic TPD trainings are needed within HE, “as an integrated part of the educators’ work responsibilities” [61; 201]. “Wikis and action research are congruent” [36; 1] based on the fact that the way a wiki works is echoed in the methodological aspects of action research.

Additionally, “Wikis fit perfectly into the participatory paradigm called for by Reason and Bradbury” [36; 7-8] and therefore offer a significant research potential for studying and improving TPD programmes since wiki pages afford a detailed view on how participants interact actively with one another and construct knowledge within their own teaching and learning contexts. Nevertheless, there is still much research to be done in understanding the way in which action research can be used in an online collaborative environment such as a wiki for studying TPD.

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