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1. METHODOLOGICAL CHALLENGES WHEN EXPLORING NEW LEARNING SITES IN EDUCATIONAL RESEARCH

INTRODUCTION

In a variety of educational contexts today, educators, policy-makers and researchers are turning to ICT-based practices to design learning materials, to structure educational methods, to enhance learning outcomes and experiences, and to develop new approaches in supporting teaching and learning (Athanassios, 2012; Laurillard, 2012; Price, Jewitt, & Brown, 2013a; Punie & Ala-Mutka, 2007). Empowered by technology, students and teachers are turning established teaching models on their heads by "flipping the classroom", while new skills and demands from the work environment are redefining the emphasis within educational institutions. Moreover, digital media is perceived as a catalyst for new forms of knowledge production by facilitating a variety of opportunities to share content and resources (Drotner, 2013; Sefton-Green, 2013; Leander, Phillips, & Taylor, 2010).

Due to their access to the Internet and a variety of low-cost digital authoring tools, young people today have a broader social and technological repertoire to engage in self-authoring and digital media production (Ito et al., 2013; Ito, 2009). A person with a smartphone has instantaneous access to millions of articles, books, essays, academic research, lectures and courses on every imaginable subject. This development has broken down the barriers that used to exist between knowledge and schools and libraries that were the gatekeepers of knowledge. Young people live in an interactive culture characterized by unlimited access to information and content – anytime, anywhere. Digital media and networks have become a "taken for granted" part of our everyday lives, and thus, provide alternative approaches to how we engage in learning, communication and creative expression (Erstad, 2012; Furlong & Davies, 2012; Miller & Horst, 2012; Ito et al., 2010; Buckingham, 2008; Gee, 2004; Leander et al., 2010). The point of departure of this volume is the question of how we can approach and develop our research methodology in educational research in order to cope with the new digital environment we are facing.

Over the last decade, the practices by which scholarly knowledge is produced – both within and across disciplines – have been substantially influenced by the appearance of digital information resources, communication networks and technology enhanced research tools. Viewed from a methodological perspective, the rich ICT-based environment in educational settings influences research methods, ethics and the general conduct of research. Digital videos and multimedia

G.B. Gudmundsdottir and K.B. Vasbø (Eds.), Methodological Challenges When Exploring Digital Learning Spaces in Education, 1–9.

make it possible to capture and share much richer records of human action and context, enabling a flexible analysis not only of static artifacts and talk, but also a spectrum of symbolic and physical interactions, including gestures, movements in space and changes over time. The possibilities within these new forms of data are numerous, but at the same time the digitisation of data and other technological developments create new methodological challenges. Although there are rapid shifts in technical development and the types of devices, networks and practices that people engage in, the theoretical and methodological approaches to the pedagogical use of digital technology are developing at a much slower pace (Price, Jewitt, & Brown, 2013b). When we conduct research on current learning practices as they unfold, across and between online and offline contexts, both in an empirically and a methodological sense, our research skills, tools and strategies are put to the test.

This volume is devoted to stimulating debate about the various methodological challenges facing the researcher in the digital sphere of educational research, and furthermore, exploring what kind of new methodological approaches these challenges impose. From various perspectives, the chapters deal with three particularly demanding challenges for educational research in digital learning contexts. The first challenge concerns how research manages to explore networked learning within a multi-faceted ICT environment. What kind of research designs and forms of data collection are able to grasp this complexity of multiple learning taking place within these contexts? The second challenge deals with how researchers experience the research context and interact with various actors within these settings. How to capture and understand interaction between contexts and across different dimensions of contexts in time and space? And finally, the third challenge is about exploring how children make meaning across physical places and virtual spaces. How can researchers manage to analyse processes of meaning making, as they play out simultaneously both online and offline? How to capture learning taking place between contexts? All together, these challenges are questioning the traditional focus on physical places in educational research as the main site for research (Leander et al., 2010). Furthermore, they are questioning the traditional research methods that we use and are familiar with.

New Perspectives on Learning and Space

Over the past 20 years, interest in spatial aspects of human life and social relations has become widespread in a variety of academic disciplines including education (Leander et al., 2010). Perspectives of what the notion of space entails have varied across different authors (Savin-Baden & Howell Major, 2010), and a broad variety of discussions concerning space have become more evident in educational research, challenging established frameworks, theories and practices (Kalervo, 2011). The term “spatial turn” was introduced by the human geographer Edward Soja (1996) who argued for real and imagined spaces to be brought together. On account of Soja’s contribution, among others, space is now acknowledged across the disciplines as a formidable force that shapes human actions. Whereas space was

previously thought of as empty, available and waiting to be filled up, recent theories have revealed that space is a product and process of socially dynamic relations that shape our lives in various ways (Sheehy & Leander, 2004; Pink, 2012).

Space and spatiality are seen as active and formative processes developing over time. The new idea of spatiality of human life separates places from their location, and place is understood in terms of movement and relationships. Furthermore, Moje (2004) claims that material spaces and places shape and reflect our identity and literacy practices. Historically, the field of learning has had a top-down approach, but this is being turned on its head. According to Leander et al. (2010), there is an emergent agenda in educational research for studying students' learning across space and time in an interdisciplinary way. In this volume, we are inspired by this perspective, and the contributors originate from a wide range of subdivisions within educational research using various methodological approaches. By challenging the perception of the "classroom as a container" for learning, which is a traditional understanding within educational research, Leander et al. introduce an alternative perspective opening up the classroom, by introducing the expression "a node in a network" as a metaphor for the new classroom. The role of new technologies is to support the alternative discourse provided by Leander et al. focusing on themes like learning in place, learning trajectories, learning networks, learning geographies and mobility. Following this line of thinking, digital media serve to further disperse and transform arenas of learning because they are not bound to specific localities, spaces or times of use. The new dynamic perspective of space also strongly affects how we conduct research on learning (Leander et al., 2010; Sheehy & Leander, 2004; Savin-Baden & Howell Major, 2010). Once the concepts and phenomena we want to study are fluid and changing, our research focus and tools need to become unsettled and capable of moving between and across multiple spaces. The chapters in this volume present different angles problematizing how we can capture, explore and understand how learning and meaning making take place across different dimensions of contexts in time and space.

The Multi-Sited Context of Research

Digital technology has been applied, adapted and integrated in existing approaches and established qualitative research methodologies. However, researchers are faced with challenges about what it means to be a qualitative researcher in new immersive learning spaces and how qualitative research plays out within a number of environmental and cultural variables (Savin-Baden & Howell Major, 2010). The development and use of new technology in learning environments, in which education is delivered and supported through ICT, compel researchers to face a number of challenges concerning the exploration and how to make new spaces of learning transparent and accessible for research.

In order to capture interaction and learning taking place across the different dimensions of context in time and space, Drotner (2013) emphasizes the need for

"processual methodologies". In a similar manner, Pink (2012) uses the concept of "the multi-sensory Internet". According to Drotner, online and offline participant observation, video recording, and participatory design – among others – are good examples of processual methodologies already taking place in qualitative research within media studies and education studies. Educational ethnography is a subfield in education research, which has its roots in anthropology and microsociology. From the late 1960s, researchers within this field were mostly studying class and gender in school. However, from the 1990s, the research interest began to widen and became more oriented towards out of school activities – vocational training, learning in community centres, in sport clubs, museums and as part of the entire life course (Drotner, 2013). New perspectives on learning challenge the traditional focus in ethnography on bounded physical places as the centre of interest (Leander et al., 2010). According to Drotner, digital forms of learning change the dilemmas for the researcher utilizing processual methodologies when it comes to defining the research subject or research object, and it changes the relation between the researcher and the research person. In order to understand and capture learning in transaction, Drotner claims it is time to develop multi-sited research designs and new creative forms of data collection. Furthermore, the new blend of physical places and virtual spaces of meaning making in these learning processes demands a multidimensional way of examining and analysing these processes *in situ*, when they play out synchronously online and offline (Drotner, 2013). Current research taking place across a range of times and sites underscores the need to develop new methodological approaches and forms of analysis.

OUTLINE OF THE BOOK

This volume presents researchers who use a wide variety of perspectives and qualitative methods to explore ICT in a number of different learning contexts. The following chapters can be categorized into three main themes: (1) challenges when exploring networked learning and virtual environments; (2) challenges for researcher interaction in various learning sites; and (3) challenges when exploring children's meaning making in digital contexts. The final chapter draws on the former chapters, views the way ahead and suggests some future approaches important for research and methodological considerations when researching learning contexts of the future.

Part I: Challenges When Exploring Networked Learning and Virtual Environments

The three chapters in the first section of this volume discuss challenges when investigating learning across various virtual environments and networked contexts. In chapter two, Murphy, Castillo, Zahra and Wagner explore how learning experiences that are mediated by mobile technologies (mLearning) expand opportunities to assist and support learning and expand the frontier for educational initiatives from different parts of the world. Mobile technologies may allow users to select when, where and how their learning activities occur. Providing innovative

opportunities for highly individualized learning pushes the boundaries of traditional educational tools, which were typically confined by content, location and functionality. The authors claim it is of critical importance to define new ways for understanding how learning occurs with mobile technologies and to improve methodological approaches for analysing learning outcomes across multiple online and offline contexts. By suggesting research designs sensitive to the ways in which mobile applications are used in and across distinct settings, Murphy and her colleagues provide a detailed characterization of core elements that contribute to an mLearning design solution and the particular techniques used to promote behavioural change and learning.

In chapter three, Stornaiuolo and Hall address the dual challenge of investigating how ICTs are changing the face of education while also trying to mediate the use of these digital technologies in the research process itself. The authors illustrate how challenges of mobility and interconnectedness in networked communicative contexts are manifested in one of their projects as *resonance*, the intertextual echoing of ideas across spaces, people and texts. To illustrate the concept, they trace one example of resonance across the data by following how conversations around sexuality emerged across the networked community and how this emergence was crystallized in participants' semiotic activity. Stornaiuolo and Hall discuss the persistent challenges in addressing issues of resonance and, indeed, in capturing and representing the complexity of participants' learning and engagement across spaces. They claim that there is a need to weave multiple methodologies together in order to continue expanding researchers' methodological toolkits and enable them to work synergistically across research methodologies. Such an effort across interdisciplinary and technological frontiers is necessary in order to account for the emergent dimensions of meaning making in networked contexts.

In chapter four, Burkle and Magee discuss methodological challenges in designing educational research projects on videogames and 3D online virtual reality environments. The authors explore how research possibilities and challenges are emerging because digital environments and virtual reality are transforming the way learners and instructors interact with each other in and across contexts. Using data from two parallel research projects, the chapter analyses the research challenges of exploring students' self-identity, problem solving, learning motivations and value construction when interacting with each other for learning in a virtual environment. The authors suggest a practical and more straight-forward research approach, such as the think aloud approach that has been used when researchers examine the thought processes of users engaged in technology-mediated environments. Burkle and Magee claim that such an open methodological approach is capable of examining learning in videogames and virtual realities by, for example, letting the research process be guided by questions articulated by the research persons.

Part II: Challenges for Researcher Interaction in Various Learning Sites

The two chapters in the second section of the book discuss challenges and possibilities in the relationship between the researcher and the researched person in digital learning environments. In chapter five, Donovan discusses how participatory research and design with youth co-researchers presents methodological challenges that, when they are met, help build capacities for critiquing and engaging private modes of knowledge production. Donovan claims that the productive and entertaining promises of proprietary communication, education and play media in post-industrial societies have led to the widespread adoption among youth whose daily activities now generate troves of data that are mined for profit. As young people learn to text, email, browse and search within such environments, their identity configurations link up with informational modes of capitalist production. In his chapter, Donovan presents a methodological approach aimed at involving young people in the collaborative process of research and reflection through the co-design of an open source social network.

In chapter six, Hatlevik and Egeberg present and discuss experiences from a research project where researchers were asked to follow the implementation of interactive whiteboards in a school. They discuss the relationship between the researcher and the research person from another angle than the previous chapter, particularly problematizing how researchers can manage both the role of the researcher and the educational expert when the researchers and the teachers have different goals and expectations of the outcome of the researchers' participation in the project. From a research perspective, a fundamental question when technology is introduced in schools is how to gather and analyse data that can shed light on issues related to the implementation and use of technology in teaching. A video clip might be used as a tool for researchers achieving consensus when concluding on empirical findings. However, a teacher might view the clip with another intention, for example, to improve his or her practice. Hatlevik and Egeberg suggest constructing research groups that possess the necessary knowledge and experience to achieve the goals of the study and at the same time meet the expectations of the research subjects.

Part III: Challenges When Exploring Children's Meaning Making in Digital Contexts

The two chapters in the last section of the book discuss challenges when exploring and investigating how young people are making meaning across physical places and virtual spaces. In chapter seven, Pribišev Beleslin addresses challenges when combining different methodological approaches in order to investigate how small children make meaning when they use ICT. In order to discover the richness of young children's stories about digital culture, Pribišev Beleslin makes use of a mosaic approach inspired by the "pedagogy of listening", which is based on relations, encounters and dialogues between co-constructers of meaning making. Pribišev Beleslin presents a methodological approach suggesting researchers listen

carefully to the children and access their perspectives and early experiences by combining a mosaic of participatory methods. Such an approach represents a source of many pieces in a puzzle that creates an image of children's worlds, both individual and collective.

In chapter eight, Davidsen and Vanderlinde similarly apply the children's perspective and highlight the importance – as well as the lack – of doing so in studies of ICT. The authors discuss the challenges and potentials of using micro multimodal video analysis of children's collaborative learning activities supported by touch-screen technology. Their research project integrating touch-screens in two primary school classrooms explores children between the age of eight and nine years. As a methodological approach, Davidsen and Vanderlinde suggest making use of micro multimodal video analysis in order to provide thick descriptions of how young children experience and interact with ICT in a specific context, focusing on how they engage in collaboration through language, gestures and digital learning materials. Most importantly, their contributions together with Pribišev Beleslin's chapter show how to conduct research from the children's perspective, and how such a perspective can enrich both teachers' pedagogical thinking as well as qualify our scientific understanding of how children are acting and making meaning in a digital environment.

FINAL CONSIDERATIONS

The ninth and concluding chapter in this volume continues the discussion from the introductory chapter regarding new perspectives and understanding of space as a fluid concept and the challenges investigating learning that takes place across space over time. In this chapter, Gilje and Erstad discuss transitions and trajectories in young peoples' learning lives and in particular the methodological challenges of studying learning across contexts. Technological developments create changes in the social practices we are studying, and provide us with new tools for doing empirical work. Gilje and Erstad's concerns are how we can research the learning lives of young adults. Methodologically, it is complex and difficult to follow learners across and between sites or conceptually, tracing, translating and reconfiguring understanding across contexts. Drawing on two large studies (Learning Lives and KnowMo), the authors suggest how research on trajectories of participation and transitions in young adults' learning lives can take place across contexts. Based on experiences from these projects, the authors raise some issues and challenges about using digital media to collect and analyse data, and ways of involving study subjects as co-researchers.

The overall aim of this volume is to explore some key challenges for educational research in digital contexts. The result is a collection of contributions that do not focus on a particular aspect of qualitative methods, but rather a volume that reflects on both the variety of accessible research methods and possibilities for developing new methods designed to capture new understandings of learning taking place across and between online and offline spaces. The various contributions in this volume explore the three main challenges we claim are raised

by the growth of ICT in educational research today. These challenges are (1) how research manages to explore networked learning within a multi-faceted ICT environment; (2) how researchers experience the research context and interact with various actors within these settings; and (3) how children make meaning across physical places and virtual spaces. Together, these nine chapters problematize how we observe and describe emerging forms of learning in current educational research when ICT is both the medium and the object of research.

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