Chapter 5
Teachers' Use of Learning Technology in a South Asian Context

Uzair Shah

Introduction

Education technologists are exploiting the benefits of information and communications technology (ICT) to transform the teaching methods in universities. There has been a significant increase in the use of e-mail, Internet and computer conferencing especially within technologically advanced countries, allowing interactions and collaboration for supporting networked learning which is defined as 'learning in which information and communications technology is used to promote connections: between one learner and other learners; between learners and tutors; between a learning community and its learning resources' (Goodyear, Banks, Hodgson, & McConnell, 2004).

Hodgson and Watland (2004) suggest that there is much to understand about networked learning in terms of the teaching and learning methods and approaches for students and lecturers, and according to Brower (2003) more attention is required to understand effective utilization of ICT within online pedagogical practices. The transition from the face-to-face 'conventional' teaching settings to online environments can introduce unfamiliarity and uncertainty, which may challenge our perceptions of the world around us as Boon and Sinclair (2012) state:

> With one foot in the real and another in the virtual, users must come to terms with both difference and disquiet in order to participate effectively in networked learning environments (Boon & Sinclair, 2012).

This raises questions around the teachers' experiences of using learning technology within the pedagogical practices generally and in networked learning settings specifically. Considering the metaphor 'one foot in the virtual and another in the real', I wondered if this transition could be made smoother through better

U. Shah (✉)
Department of Management Learning & Leadership, Lancaster University Management School, Lancaster, UK
e-mail: s.shah2@lancaster.ac.uk

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understanding of the teachers' experiences of using learning technology within the conventional pedagogical practices.

There is a growing body of literature available that investigates the phenomenon of using learning technology in education (see for example Hu, Clark, & Ma, 2003; Jimoyiannis & Komis, 2007; Rienties et al., 2012; Rienties, Brouwer, & Lygo-Baker, 2013). However, only a few studies have explored this phenomenon from a *relational*, phenomenographic perspective (González, 2010). Gonzalez called for more research as the 'field is only at the beginning of understanding the complexities of what university teachers think eLearning is good for in their 'established' face-to-face university teaching … with important implications for academic development'. As Amin and Thrift (2005) stated that 'no particular theoretical approach, even in combination with others, can be used to gain a total grip on what's going on'. This study aims to further enrich our understanding of the teachers' conceptions of using learning technology from a phenomenographic perspective. This is important as according to Lawless and Pellegrino (2007), there is 'absence of empirically grounded knowledge about how to best integrate technology, instruction, and learning into a coherent whole'. Also, Jimoyiannis and Komis (2007) called for a 'thorough analysis of teachers' conceptions of ICT in education (to) provide insights into the prerequisites for their successful preparation'. Furthermore, using the phenomenographic perspective can contribute to our understanding of 'how the gap between contents of the mind and professional practice is bridged' (Dall'Alba & Sandberg, 2006).

While the extant phenomenographic literature has contributed to our understandings of the teachers' practices of using learning technology, these studies are primarily based within western contexts (see 2010; Ellis, Steed, & Applebee, 2006; Gonzalez, 2009; Lameras, Levy, Paraskakis, & Webber, 2012; McConnell & Zhao, 2006; Roberts, 2003). Unfortunately, there is little evidence available on the users' perceptions of e-learning in the context of less developed countries (Bataineh & Baniabdelrahman, 2006) even though one-fifth of the worldwide enrolment in higher education is from within the less developed countries (Schofer & Meyer, 2005). Furthermore, Taylor (2005 cited by Shaikh, 2009) stated that the World Bank expects the 'number of HE students will more than double from 70 million to 160 million by 2025'. These statistics raise some interesting questions around the potential value and contributions of networked learning within the higher education. How should we engage with partners from different contexts where there could be variations in the perceptions, infrastructure and circumstances that are likely to affect the use of learning technology (Czerniewicz & Brown, 2012; Fahmy, Bygholm, & Jaeger, 2012)? Also how could the concept and community of networked learning accommodate these variations in the understandings and exposure of using learning technology in these different contexts?

Considering this, it will be useful to explore the teachers' use of learning technology within their 'conventional' pedagogical practices in a different non-western context. Marton, Dall'Alba, and Beaty (1993) stated that research in a different setting and with a different group could reveal 'new' conceptions that may improve our understanding of phenomena. Such a research focus could

contribute to our understandings of using learning technology in different contexts and may facilitate in dealing with the challenges of interculturality considering the growing attention given to internationalization of higher education (see Fahmy et al., 2012).

While the South Asian countries like India, Pakistan, Bangladesh and Sri Lanka are amongst the most populated, these are 'undergoing an uneven modernisation in which large numbers remain undernourished, unhealthy and illiterate. Participation in tertiary education is relatively low ... and in most South Asia nations the growing middle class is becoming more interested in cross-border education' (Marginson, 2004, p. 79). While in most western contexts, access to education and availability of quality technological infrastructure are often assumed, locating this study in such contexts makes it more interesting as countries like Pakistan continue to deal with challenges of 'uneven modernisation' where there is relatively limited access to quality education and a low per capita income to discourage wider population to buy computers and afford Internet services (Shafique & Mahmood, 2008). Keogh (2001) warns that 'unless the issue of access is addressed, the ICTs will increase divisions within societies'. Considering these aspects, this study explores the *qualitatively different ways teachers understand use of learning technology in a public university of Pakistan*.

Research Context

Pakistan has a growing population of approximately 180 million. Realizing the importance of using ICT, the government continues to invest in the country's telecommunication infrastructure after its first IT Policy in 2000 (Shafique & Mahmood, 2008). According to Malik and Shabbir (2008), Pakistan's Higher Education sector has been transformed with the adoption of technological advancements to support teaching and student learning. Digital libraries are available to many universities, and the Pakistan Education & Research Network (PERN) pushes for better utilization of learning technology for personal development of teachers (Malik & Shabbir, 2008). Having said this, there is research available suggesting that while some university teachers realize the significance of using learning technology, the majority perceived the use of technology within their pedagogical practices as 'intimidating' and expected administrative support Nawaz and Kundi (2010); Ali et al (2010). According to Shaikh (2009), limited availability of ICT facilities to the wider population remains a barrier in its integration within the higher education.

Also, with greater emphasis on memorization and acquisition of information and less on students' deep thinking, passive rote learning and instructional teaching approach appear dominant within the Pakistani schools. Such a learning and teaching approach could be problematic especially when expecting the students to take ownership and responsibility for their individual learning and for the teachers to assume the role of facilitators of the learning process. Considering

that these are important aspects within networked learning, it becomes further worrying as networked learning is seen with the potential to contribute towards the transformation of higher education which is deemed necessary for the 'global economy that is based on information and social networks' (Hodgson, McConnell, & Dirckinck-Holmfeld, 2012).

With the prevailing instructional teaching approach and the growing digitalization of pedagogical practice, such challenges and opportunities make Pakistan an interesting country to locate this research. Influenced by these thoughts and realizing that our own understanding of this phenomenon in this context is limited, this empirical study explores the qualitative variations in the teachers' understandings and perceptions of using learning technology within their 'conventional' pedagogical practices in the context of a South Asian Pakistani public university of Hazara University (HU).

HU was formed in 2002 with the initiative of the Higher Education Commission (HEC) of Pakistan. Since then, it has grown in size and disciplines with three campuses which host Faculties of Science, Arts, Health Sciences, Law and Administrative Science and also a School of Cultural Heritage and Creative Technologies (www.hu.edu.pk). There are around 20 departments that offer undergraduate and postgraduate courses. HU is striving for and developing into a research university. One of its initiatives is the National Centre for Collaborative Research and Training at the main campus. This centre aims to provide opportunities and a platform to the researchers from across the country to contribute and share their knowledge and expertise. Also, as an initiative of HEC to ensure improved and similar quality of education across the universities, Quality Enhancement Cell has been established recently.

Research Methodology

Selwyn (2012) calls for more studies that offer 'a direct 'way in' to unpacking the micro-level social processes that underpin the use of digital technologies in educational settings'. The research methodology of phenomenography presents such an opportunity. It takes a second-order research perspective to focus on the participants' descriptions of their lived experiences of the phenomenon. Phenomenography aims to identify the qualitative variations within the participants' descriptions of experiences (Marton & Booth, 1997).

Adopting an interpretive paradigm, phenomenography takes a non-dualistic, *relational* ontological stance, which implies that the person (subject) and the object of experience are fused or interrelated to one another through experience Sjöström & Dahlgren 2002. This suggests that individuals when describing their experiences are telling something about themselves and the phenomenon (Marton et al., 1997). The associated epistemological assumption of phenomenography is the way we perceive or experience our world would differ from others, and these different worlds can be understood, portrayed and communicated to others.

Marton (1981) states that there are limited number of ways in which a phenomenon can be viewed or experienced. Within phenomenographic studies, the process of data collection and analysis is closely associated to each other (Bruce & Gerber, 1995) as the intention is always to highlight the variations within the descriptions of experiences. This informs the way data is collected and analysed. When deciding on the participants and the number of interviews, one of the major considerations is the requirement to capture and exhaust the different ways a phenomenon is experienced. Booth (2001) explains that:

> Data is collected from a sample of people, deliberately chosen to cover the population of interest in important dimensions, the aim being to exhaust the variations in experience; collection of data can be extended if the variation is felt to be under-represented, or cut short if no new material is forthcoming (Booth, 2001).

Trigwell (2000) recommended a sample of between 15 and 20 participants. However, this number could increase or decrease depending upon the quality of data gathered and/or if the interview discussions repeatedly followed similar theme(s) (Booth, 2001). Ashworth and Lucas (2000) commented that:

> The selection of participants should avoid presuppositions about the nature of the phenomenon or the nature of conceptions held by particular 'type' of individuals, while observing common-sense precautions about maintaining 'variety' of experiences. (Ashworth & Lucas, 2000)

For research within higher education, Bowden (2000) further suggested interviewing participants from different disciplines, academic positions, teaching experience and genders. Keeping these suggestions in mind, I conducted 29 semi-structured interviews of academics belonging to the different Faculties at HU. The participants were from both the genders and taught either at undergraduate and/or postgraduate level. Some of these participants had extensive teaching experience, while others were newly appointed. I also interviewed teachers who were part of higher management that included Head of Departments, Deans, Registrar and also the Vice Chancellor of the HU. This selection of the participants was with the objective of maximizing the range of perspectives on the use of learning technology within their teaching practices at HU.

The focus of a phenomenographic interview is to capture how the participant experiences and understands the phenomenon under exploration. To do so, the interview questions are designed to be open ended to allow the participants to describe their experiences of the phenomenon. Rather than directing conversations, the researcher invites them to describe fully their lived experiences. In this study, the participants were asked few predetermined interview questions (mentioned below), and the follow-up questions depended on the participants' responses.

- Can you please describe your experience using learning technology in your teaching?
- How do you think the use of learning technology affected you as a teacher?
- Would you like to summarize and/or provide any other details regarding your use of learning technology?

During the interviews, the participants used English and the native language of Urdu. These interviews lasted for 40 min on average, which were audio recorded and later translated and transcribed. In this research, I used the theoretical framework of intentionality or *what*/*how* framework (Marton et al., 1997) to analyse the participants' descriptions of experiences. This framework assumes that any action undertaken has an underpinning intention(s).

While recognizing that an individual is capable of experiencing a phenomenon in different ways, phenomenography aims to categorize and group the participants' descriptions of experiences. As is the norm in phenomenographic analysis, the statements from the transcripts which did not relate with the phenomenon of using learning technology were firstly filtered out. The remaining statements were then arranged according to the different ways the participants responded to the interview questions. This resulted in an initial group of categories. These initial categories contained certain characteristics or 'utterances' (Hasselgren & Beach, 1997) that emerged from the grouping of the similarities and differences within the participants' described experiences of using learning technology. These 'utterances' provided a unique and distinctive aspect of their use of learning technology and laid the foundations for 'categories of descriptions' which is an important outcome of phenomenographic research (Marton et al., 1997). For example, in this study one of the identified categories of descriptions was professional skills development. The utterances that defined and distinguished this use of learning technology were 'student employment and skills' and 'performance at work'. Similarly, other categories had their respective utterance(s) which gave distinct meanings to the way the teachers used learning technology within their practices. Once these utterances were identified, attention was given to understand the relationships between them. Hasselgren and Beach (1997) state 'Phenomenography should be a process of analytic juxtaposition'. To explore the relationships between the utterances, questions such as 'how one category of descriptions is different from another, and what dimensions make these categories different' were considered when analysing the statements. These questions helped to achieve another important aspect of phenomenographic analysis which is to identify the dimensions of variations, or *how* aspects of the categories of description.

According to Marton and Booth (1997), a category of descriptions constitutes of the *what* aspects that highlight its meanings and the *how* aspects which illuminate the structure of the category. The *what* aspect is further linked with *direct object* which represents the primary goal or purpose of the category of descriptions. In this research, the *direct object* is reflected in the meanings associated with the categories of descriptions. Using the example of professional skills development category of description, the meaning associated (or the *what* aspects) with this use learning technology is to provide the necessary skills to their students to be better practitioners and for relevant employment after graduation. This also reflects the primary goal or *direct object* of this use of learning technology within the pedagogical practices. The *how* aspect comprises of two interrelated parts, *act* and *indirect object* (Marton et al., 1997). In this study, the *act* would refer to the action

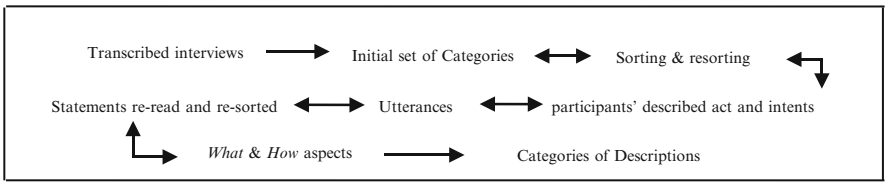

Fig. 5.1 Data analysis process

undertaken by the teachers in using learning technology, whereas the *indirect object* describes the intent(s) behind the *act* of using learning technology. I shall illustrate these aspects later in this chapter. Regarding the use of *what*/*how* framework, Harris (2011) stated:

> The what/how framework encourages researchers to analyse data in light of not just what is being understood, but to also consider the process, actions, and motives behind this understanding . . . (t)his framework allows the conception to be analysed separately from the actions and intentions related to it. (Harris, 2011)

As illustrated in the diagram below, using this framework informed the data analysis and consequently the categories of descriptions (Fig. 5.1).

Reliability and Validity

The issue of reliability and validity is a complex and contentious one within phenomenographic literature with no obvious resolution (see Åkerlind, 2004; Marton et al., 1997; Sandberg, 2005). Within qualitative studies, reliability is concerned with how the researcher deals with his/her 'biased subjectivity' (Kvale, 1994) to be honest and truthful to the participants' descriptions. While acknowledging that the 'researchers cannot escape their interpretation' (Sandberg, 2005), in this study I made conscious efforts to bracket my biases, knowledge and subjectivity using the guidelines provided by Ashworth and Lucas (2000). The research validity is concerned with 'how we, as researchers, can justify that our interpretations are truthful to lived experience within the theoretical and methodological perspective taken' (Sandberg, 2005). For this, Sandberg suggested ensuring that the participants' descriptions are embedded in their lived experiences. This was achieved through the interview and follow-up questions which encouraged and facilitated the participants to describe fully their lived experiences of using learning technology. Also, when required, I requested them to further contextualize their descriptions by providing concrete examples and situations of their use of learning technology within their practices. In addition, I referred to the guidelines provided by Cope (2002), Lamb, Sandberg, and Liesch (2011) to ensure the validity of the research findings.

Categories of Descriptions

Based on the earlier described analysis process, five qualitatively different ways of understanding the use of learning technology were identified. These are listed below in increasing order of complexity, with omnipotential category of description as the relatively most complex:

- Retaining attention
- Professional skills development
- Information enrichment
- Connectivity
- Omnipotential

Retaining attention category of descriptions represents the least complex category where the teachers described using learning technology to present lecture content in ways to retain students' attention and involvement during the lecture. One of the participants described this use to state:

> You see when you take children to a park or to a colourful area, they are happy and involved. Similar is the case with multimedia—there are many ways of presenting—with different colours, words flying into their place—so when I have used the multimedia I have found students to be more involved and attentive. (Faculty of Health Sciences, 2)

Professional skills development category of descriptions highlights the teachers' use of learning technology to provide the necessary skills to their students for better employment, to meet the expectations and requirements of organizations today and to be better practitioners in their respective fields. One participant described that 'you cannot produce professionals without giving them knowledge or without using technology during the (education) process'.

Information enrichment category of descriptions relates with the teachers' experiences of using learning technology to access multiple-sourced information. They described using learning technology to update their teaching material with recently published research papers and other sources of information related to the lecture topic. This has been described to add value in their preparation of the teaching material as well as their individual research as one of them stated that:

> Usually in my case, since I have 16 years of experience so I am aware of what things need to be done for the lectures and how much time would be designed on the paper and how much on the board. Still, I use Google scholar, amazon, e-journals. (Faculty of Arts, 10)

Connectivity category of descriptions highlights the communicational aspect of learning technology where the teachers experienced using it to connect and collaborate with other academics, universities, research organizations or the government's education departments. In such experiences, the teachers described using learning technology as the platform to share academic material and information, discuss and connect with other academics. One participant described such experience:

> Then there is a person in an IT institution in Rajasthan in India. Through the internet, he became my friend with whom I interact about such things (technology applications). That is a great help to us. Suppose there is a new book and we cannot access it here. They would download the book and send it to me. (Faculty of Law & Administrative Sciences, 2)

Omnipotential is relatively the most complex category of description where the teachers described using learning technology as means and tool for numerous possibilities and opportunities that may be difficult otherwise. The teachers described using it in multiple ways ranging from its real-time use in classrooms to information collection and research activities to collaboration with the academics and institutions outside HU. Furthermore, these teachers described themselves as participants of a global academic community and understood the use of learning technology as important to contribute and compete within this global community. Also such use is associated to promote social equality and to mitigate the divisions within the society.

As mentioned earlier that a category of descriptions constitutes of the *what* aspects (i.e. meanings associated as elaborated above) and *how* aspects, or dimensions of variations (Marton et al., 1997). The *how* aspects identified in this study were *prior exposure of technology, research-informed teaching* and *perceived scope of technological use*. 'Prior exposure of technology' highlights the teachers' previous experiences of technology as a student or at earlier employment. The descriptions of experiences suggest that the teachers' prior exposure of technology (ranging from less sophisticated to sophisticated exposure) influenced their use of learning technology.

'Research-informed teaching' dimension of variation relates to the consideration given to include and refer to the research aspects/literature when preparing the teaching material. The relatively 'less' research-informed teaching material comprises largely of existing teaching notes which are modified through a 'peripheral' literature review. However, within the 'more' research-informed teaching material, research aspect/literature review becomes an integral aspect of their pedagogical practices.

The third dimension of variation of 'perceived scope of technological use' describes how the teachers saw the role and use of technology within pedagogical practices in the coming future. When the described perceived scope of use was 'limited', they viewed the use of learning technology to be confined to particular aspects of the pedagogical practices. However, when the teachers described the perceived scope as 'broad', the teachers understood the use of learning technology to have implications not only within their practices but also on a broader, societal level. These dimensions of variations are seen to influence the teachers' use of learning technology. Their relationships with the categories of descriptions of using learning technology are presented in the table below (Table 5.1).

As mentioned earlier, the omnipotential category of descriptions is the most sophisticated and inclusive of other categories. Aspects considered important within networked learning surfaced strongly within the omnipotential descriptions of using learning technology. In this chapter, I will focus on the analysis of the omnipotential category of description in further depth. This is to elaborate on its

Table 5.1 *What* and *How* aspects of teachers' experiences of using learning technology

		How aspects		
Category of descriptions	*What* aspects	Prior exposure of technology	Research-informed teaching	Perceived scope of technological use
Retaining attention	To retain attention of students during lectures	Less sophisticated	Less	Limited
Professional skills development	To allow students to be better practitioners and improve employability	↓	↓	↓
Information enrichment	To efficiently access multiple sourced information to enrich teaching notes and research			
Connectivity	To connect and communicate with other academics			
Omnipotential	As means and tool for numerous possibilities and opportunities	Sophisticated	More	Broad

usefulness and complexity that may assist academics in making the transition from the conventional settings into online learning environments. I will discuss the *what* and *how* aspects using quotations from the transcripts to highlight the meanings and structural aspects of this category of description. The transcripts are labelled with the participants' respective Faculty and a random number for confidentiality purpose.

Omnipotential: What Aspects

In this category of description, the teachers described using learning technology as means and tool for numerous possibilities and opportunities which would have been difficult otherwise. In these descriptions, the role and involvement of learning technology were perceived as important to affect their pedagogical practices on many levels, varying from the preparation of teaching material to individual research to career progression, as described below:

> Technology is the need of the day and has to be tightly linked with teaching. At this time, you cannot go without technology, cannot prosper, succeed or be fruitful or efficient in your teaching without technology. (Faculty of Arts, 1)

The above description elaborates the influence of using learning technology as its use is related with prosperity, success and efficiency within the pedagogical practices. Within the omnipotential descriptions of experiences, the increasing rate of change within academic literature, innovations and global market scenario was highlighted. The teachers also described the importance of understanding and referring to these changes within their teaching as suggested below:

> If you are studying or teaching management or business related things, in that there are almost innovations on daily basis; new innovations, inventions, new marketing tools, new customer complaints and reactions and others; these keep on being updated. Technology is the sole means that keeps us updated with these innovations or developments . . . also you know, make international contacts with people . . . if you keep aside books, latest situations on markets and products, technology can provide us with these situations easily. (Faculty of Law & Administrative Sciences, 3)

As described above, within omnipotential descriptions of experiences, the learning technology is seen as a primary source to keep updated with recent developments. The teacher above mentions using learning technology to establish connections and interact with people/academics in different countries. This aspect of omnipotential experience of using learning technology relates to the conception of 'connectivity', where the teachers experience use of learning technology to purposefully connect and collaborate with other academics, aspects which are considered important within networked learning. In addition, he is able to benefit from such use of learning technology on multiple levels to affect his teaching content to include recent developments of the field to provide exposure to his students and himself. Another teacher views the inclusion of learning technology to have revolutionized the practices to introduce various possibilities and opportunities for individuals as highlighted below:

> The revolution brought by the internet is amazing—I think it has the whole world squeezed—squeezed in one hand, the world is in my hand in my mobile phone which has internet. With this, I can talk to anyone in any corner of this world but I can use it in a wrong way. It depends on me—if my consciousness is not awake, I would use it negatively. (Faculty of Arts, 13)

The above extract elaborates the teacher's meanings of using learning technology as means or tool for opportunities and possibilities. It also highlights aspects of networked learning where learning technology is used to connect and interact with people and to share and discuss ideas and information. While appreciating the various possibilities, the ethical use of technology and self-accountability is considered important. This resonates with the notion of digital tools as 'neither innocent nor culturally neutral' and responsible use of learning technology (Ross, 2012). Furthermore, another teacher elaborates the omnipotential use of learning technology by relating to the success of the institution as mentioned below:

> You should know that our university is ranked 25th nationally from among the 95 degree awarding institutes. If the technology wasn't here, it would not be this soon—would have taken much time. (Faculty of Science, 9)

The above statements illuminate the omnipotential understanding of using learning technology to influence the ranking of the university. This implies that within omnipotential understandings of using learning technology, the teachers described its use with the potential to affect not only at an individual but also on a community level. In order to better understand the structure of omnipotential category of description, I will discuss the *how* aspects separately which will further illuminate the teachers' *acts* and the interrelated *indirect object(s)* of using learning technology.

How Aspect of Prior Exposure of Technology

As mentioned earlier that omnipotential conception is relatively most complex and is inclusive of other conceptions. This implies that while describing their omnipotential experiences of using learning technology, the teacher may illuminate aspects relating to other conceptions, as is described below:

> The role of technology from now onwards would increase tremendously. There are reasons behind it—if you remember things in the last 10 years, if a professor wanted a paper—first there was no option of subscribing and so would continue to search for places from where he could get a volume of a journal and request or write to others for the volume . . . now the technology does it! (Use of learning technology) starts from browsing, sifting, analyzing, and bringing to the multimedia—in all these you need to use technology. (Faculty of Law & Administrative Sciences, 2)

The above excerpt illuminates the teacher's prior exposure to technology in describing the difficulties faced in accessing academic journal. This is further related and reflected against the role and use of learning technology within his current pedagogical practices. Such reflections facilitate to foresee the influence of learning technology, as he states that the 'role of technology from now onwards would increase tremendously'. This further describes his intention, or *indirect object* which is related to three different *acts* mentioned in the passage; firstly, the manner in which academic literature was searched in the earlier decade(s), the teacher's existing approach towards searching and analysing literature and, lastly, presentation of the teaching material. Collectively, these *acts* and intent interplay to complement 'sophisticated' prior exposure of technology. This description of experience also reflects his willingness to engage with academic material/learning resources which further influences his use of learning technology within the teaching practices. It also includes aspects of 'information enrichment' category of description when the teacher states that the '(use of learning technology) starts from browsing, sifting, analyzing', suggesting that learning technology is used to gather information from various sources and to analyse the collected data. However, the complex meanings associated to use of learning technology distinguish this description of experiences from other descriptions.

How Aspect of Research-Informed Teaching

The relatively more 'research-informed' teaching reflects upon the pedagogical practices within which the research aspect and/or literature review is considered important. Such teaching practices surfaced prominently within the omnipotential use of learning technology, as is described below:

> If we teach students about what was done 100 years, then the students wouldn't get the latest knowledge. But if we are using computer and internet, we can get latest information. I will give you an example. . .(of) our own research where we determined three pairing in chromosomes—if a teacher hasn't downloaded this journal, he would still be teaching the old concepts i.e. there is only one pairing. So this is very important to use learning technologies as then we can give latest information to students, about what is happening in the world, about the different methods of detecting diseases, about finding cure for cancer but through authentic sources. (Faculty of Science, 6)

The teacher above provides his omnipotential understandings of using learning technology. He describes the *acts* of using the Internet for literature review and his individual research. This is with the interrelated *indirect object* of providing his students with latest developments in the field, which may lead to the possibility to detect different diseases and finding their cures. He further speaks of finding possible cures for cancer. This interrelation of *act* and *indirect object* influences his meanings to his omnipotential understanding of the use of learning technology as the means for opportunities and possibilities.

How Aspect of Perceived Scope of Technological Use

Omnipotential descriptions of experiences highlight the teachers' perceived 'broad' scope of technological use in the coming future. The teachers described the use of learning technology to not only influence on the individual but also on collective, societal level, as described below:

> If we look from the research point of view, the gap in science between west and east is almost finished. Things that are done in US, Canada or Japan are exactly the same in the lab of HU. The same machine which is used abroad is used here in our lab. See, the books I had with me which I thought were an asset, today they may not be assets anymore and are part of the archives. This is because the knowledge is upgraded on daily basis. This is why the young people and the new universities are moving forward with good pace because people in those universities are accustomed to the new technologies and are benefitting from them . . . The lecture which you have to prepare on today's development, if your energy systems are not supporting you then you would speak about yesterday as your knowledge would not be updated . . . so it affects the quality of learning of students and the quality of the (research) product. (Faculty of Science, 9)

In this described experience, the described *acts* are using PCR machine in the laboratory of HU, and the other is use of books in his personal library. These *acts* are associated with several *indirect objects*. First is to keep updated with recent

research developments; second is to stay tuned with sophisticated research instruments and benefit from them; third is the development and progress of universities at good pace; and last, on a larger scale, is to further reduce the 'gap in science between west and east'. Such complexity of intents is associated the 'broad' perceived scope of technological use. It can also be implied from the above description that he sees the awareness of technological development and comfort/ease in the use of learning technology to be an asset. The above-described *acts* relate with 'information enrichment' category; however, sophisticated *indirect objects* provide a different, richer meaning of his experiences of using learning technology. This further illuminates the complex nature of omnipotential category of description that is most elaborate and is inclusive of other categories. Having said so, he also highlights contextual challenges faced at HU. There are issues around irregular availability of electricity which affect use of learning technology and negatively influence teaching and research. Also, the limited access to information and published research affected the pedagogical practices, as they are unable to refer to contemporary research within their teaching notes and consequently 'speak about yesterday (research) as your knowledge would not be updated'. This affects not only student learning but also the research conducted at HU. The following figure illustrates the relationship of omnipotential *what* and *how* aspects.

Discussion

The findings of this research have certain similarities with the extant phenomenographic literature. Based in the context of a Scottish university, Roberts's (2003) research identified conceptions of using Web within teaching practices which were to 'provide information' and for 'individual and independent self-paced learning'. González's (2010) study of conceptions of teaching using e-learning in the context of two campus-based research-intensive Australian universities identified conceptions that varied from 'e-learning as a medium to provide information' to 'e-learning as a medium for engaging in communication–collaboration–knowledge building' (González (2010)), while McConnell and Zhao (2006) research findings from interviews of Chinese university teachers suggested they preferred face-to-face lectures and viewed e-learning as a source mainly to upload learning material for students' individual learning.

This study illuminates the ubiquitous nature of learning technology as the teachers attempt to digitalize various aspects of their pedagogical practices in more or less complex ways. It provides additional ways of looking at the use of learning technology to those mentioned in the literature as 'retaining attention' or 'omnipotential' conceptions have not been reported before. Retaining attention conception was the least complex conception that highlights the use of learning technology to retain the students' attention while teaching. Such use of learning technology was underpinned by an 'information–transmission' teaching approach as was highlighted by one of the participants that the 'students have to learn from

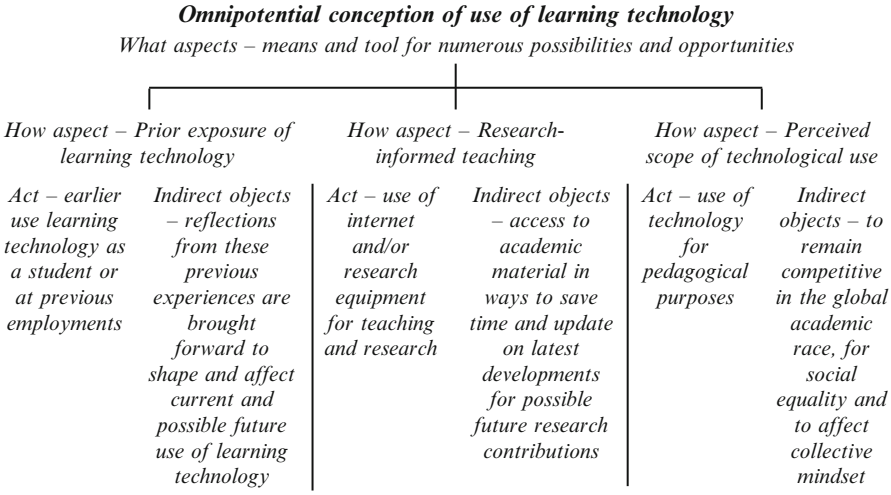

Fig. 5.2 Relationships of omnipotential *what* and *how* aspects

the teacher' (Faculty of Science, 9). These teachers described positioning themselves as the 'sage on stage' and used learning technology accordingly in a classroom setting.

On the other hand, omnipotential conception is the relatively most complex, elaborate and is inclusive of other conceptions. The teachers with omnipotential understanding used learning technology to contribute to their pedagogical practices on different fronts. Such use of learning technology was underpinned by the teachers' rich pedagogical understandings where they perceived the teaching role as the facilitators rather than the drivers of the learning process. They understood the use of learning technology to access and engage with the learning resources and also for students' online discussions and dialogue to develop deeper understandings. One of the participants described that 'I use internet for communication - I use my Facebook account and share it with the students and we get connected to each other and exchange knowledge' (Faculty of Arts, 10). Also, as highlighted in Fig. 5.2, these teachers saw themselves as participants of their respective global academic communities and used learning technology to interact, collaborate and contribute to their respective community.

Aspects considered important within networked learning such as connecting and collaborating, sharing and discussing information/learning resources, learning communities, surfaced prominently in the omnipotential descriptions of experiences. Within such descriptions, the teachers also highlighted the importance of 'online social literacy as well as digital and information literacy' (Hodgson et al., 2012). It is argued that such relatively complex and sophisticated understandings may facilitate a smoother transition from conventional to online learning environments.

Fahmy et al. (2012) and Lameras et al. (2012) in their study highlighted the importance of considering the contextual circumstances when exploring the use of

learning technology. The findings of this study also reiterate this consideration. When describing their use of learning technology, the teachers highlighted the contextual issues such as access to information and limited technological support and infrastructure. Their teaching and research suffered due to limited and disproportionate availability of information and access to published research, as one of the teachers mentioned 'at times, we have to rely on only abstracts of the journal'. Although all the participants highlighted the contextual limitations to affect their pedagogical practices, some teachers described using learning technology omnipotentially while attempting to circumvent and/or mitigate the effects of these limitations.

Due to the government regulations, the Pakistani public universities like HU charge subsidized fees. Such universities are much dependent on the government funding to support their practices and infrastructure. This further implies that the quality of exposure and use of learning technology and consequently the learning experiences partly depended on the type of university (whether public or private university) and its financial standing. Czerniewicz and Brown (2012) stated this 'becomes yet another factor which can advantage or disadvantage individual students'.

Selwyn (2012) highlighted the need for further research to 'develop a more socially grounded understanding of the "messy" realities of educational technology 'as it happens' '. Using the phenomenographic framework of intentionality allowed illuminating not only the variations in the teachers' intentions and understandings of using learning technology but also the 'messy' realities and contextual aspects that influence their daily, mundane teaching practices.

Concluding Comments

Based in the context of a South Asian Pakistani public university, this study offers additional ways of looking at the use of learning technology within face-to-face pedagogical practices. Considering the metaphor 'one foot in the virtual and another in the real', this research contributes to our awareness and understanding of the issues around using learning technology within the pedagogical practices. It is argued that the complex use of learning technology and sophisticated underpinning pedagogical understandings associated with omnipotential conception may contribute to the academics' better preparation to 'overcome the alienation and otherness of online spaces' (Boon & Sinclair, 2012) and possibly a smoother transition into networked learning environments. This is potentially an area for future research.

Creanor and Walker (2012) suggest a better understanding of the 'relationship of people, technology and pedagogy in learning technology environments'. The analytical framework of intentionality contributed to our comprehension of this relationship and allowed us to 'consider the process, actions, and motives' (Harris, 2011) behind the teachers' use of learning technology. It highlighted the social

context of using learning technology which is essential to examine the role technology plays in learning (Hodgson et al., 2012).

This study also highlights one of the potential challenges of the variations in the pedagogical understandings which may surface when engaging with international members within networked learning environments. The journey from a passive learner to a 'self-directed learner' within a networked learning environment could be problematic and would require encouragement and facilitation in developing different, deeper approaches to learning.

McConnell, Hodgson, and Dirckinck-Holmfeld (2012) stated that 'Web 2.0 technologies have given unprecedented access to information and the world and ways of being and interaction'. However, the contextual limitations at HU affected the participants' access to information, interaction with the world and ways of being. These limitations also hindered developing 'engaged connections and collaborations'. As internationalization of higher education continues, how do we involve and engage with the international partners and members of networked learning community within such contexts for 'greater levels of mutual engagement and dedication, critical reflection, emancipatory formation and empowerments' (Hodgson et al., 2012) is another area for future research.

References

Åkerlind, G. S. (2004). A new dimension to understanding university teaching. *Teaching in Higher Education, 9*(3), 363–375.

Ali, R., Khan, M. S., Ghazi, S. R., Shahzad, S., & Khan, I. (2010). Teachers' training-a grey area in higher education. *Asian Social Science, 6*(7), P43.

Amin, A., & Thrift, N. (2005). What's left? Just the future. *Antipode, 37*(2), 220–238.

Ashworth, P., & Lucas, U. (2000). Achieving empathy and engagement: A practical approach to the design, conduct and reporting of phenomenographic research. *Studies in Higher Education, 25*(3), 295–308.

Bataineh, R., & Baniabdelrahman, A. (2006). Jordanian EFL students' perceptions of their computer literacy. *International Journal of Education and Development Using ICT, 2*(2).

Boon, S., & Sinclair, C. (2012). Life behind the screen: Taking the academic online. In L. Dirckinck-Holmfeld, V. Hodgson, & D. McConnell (Eds.), *Exploring the theory, pedagogy and practice of networked learning* (pp. 273–287). New York: Springer.

Booth, S. (2001). Learning computer science and engineering in context. *Computer Science Education, 11*(3), 169–188.

Bowden, J. (2000). The nature of phenomenographic research. In J. Bowden & E. Walsh (Eds.), *Phenomenography* (pp. 1–18). Melbourne, VIC: RMIT University Press.

Brower, H. H. (2003). On emulating classroom discussion in a distance-delivered OBHR course: Creating an on-line learning community. *Academy of Management Learning & Education, 2*(1), 22–36.

Bruce, C., & Gerber, R. (1995). Towards university lectures' conceptions of student learning. *Higher Education, 29*(4), 443–458.

Cope, C. (2004). Ensuring validity and reliability in phenomenographic research using the analytical framework of a structure of awareness. *Qualitative Research Journal, 4*(2), 5–18.

Creanor, L., & Walker, S. (2012). Learning technology in context: A case for the sociotechnical interaction framework as an analytical lens for networked learning research.

In L. Dirckinck-Holmfeld, V. Hodgson, & D. McConnell (Eds.), *Exploring the theory, pedagogy and practice of networked learning* (pp. 173–187). New York: Springer.
Czerniewicz, L., & Brown, C. (2012). Objectified cultural capital and the tale of two students. In L. Dirckinck-Holmfeld, V. Hodgson, & D. McConnell (Eds.), *Exploring the theory, pedagogy and practice of networked learning* (pp. 209–219). New York: Springer.
Dall'Alba, G., & Sandberg, J. (2006). Unveiling professional development: A critical review of stage models. *Review of Educational Research, 76*(3), 383–412.
Ellis, R. A., Steed, A. F., & Applebee, A. C. (2006). Teacher conceptions of blended learning, blended teaching and associations with approaches to design. *Australasian Journal of Educational Technology, 22*(3), 312.
Fahmy, S. S., Bygholm, A., & Jaeger, K. (2012). Issues in internationalization of education: The case of a Danish Business School exporting a blended learning MBA program to developing countries. In V. Hodgson, C. Jones, M. de Laat, D. McConnell, T. Ryberg, & P. Sloep (Eds.), *Proceedings of the Eighth International Conference on Networked Learning 2012* (pp. 276–283). http://www.networkedlearningconference.org.uk/abstracts/safwat.html
Gonzalez, C. (2009). Conceptions of, and approaches to, teaching online: A study of lecturers teaching postgraduate distance courses. *Higher Education, 57*(3), 299–314.
González, C. (2010). What do university teachers think eLearning is good for in their teaching? *Studies in Higher Education, 35*(1), 61–78.
Goodyear, P., Banks, S., Hodgson, V., & McConnell, D. (2004). Research on networked learning: An overview. In P. Goodyear, S. Banks, V. Hodgson, & D. McConnell (Eds.), *Advances in research on networked learning* (pp. 1–11). Dordrecht, The Netherlands: Kluwer Academic.
Harris, L. R. (2011). Phenomenographic perspectives on the structure of conceptions: The origins, purposes, strengths, and limitations of the what/how and referential/structural frameworks. *Educational Research Review, 6*(2), 109–124.
Hasselgren, B., & Beach, D. (1997). Phenomenography—A "good-for-nothing brother" of phenomenology? Outline of an analysis. *Higher Education Research & Development, 16*(2), 191–202.
Hodgson, V., McConnell, D., & Dirckinck-Holmfeld, L. (2012). The Theory, Practice and Pedagogy of Networked Learning. In L. Dirckinck-Holmfeld, V. Hodgson, & D. McConnell (Eds.), *Exploring the theory, pedagogy and practice of networked learning* (pp. 219–315). New York: Springer.
Hodgson, V., & Watland, P. (2004). Researching networked management learning. *Management Learning, 35*(2), 99–116.
Hu, P., Clark, T., & Ma, W. (2003). Examining technology acceptance by school teachers: A longitudinal study. *Information Management, 41*(2), 227–241.
Jimoyiannis, A., & Komis, V. (2007). Examining teachers' beliefs about ICT in education: Implications of a teacher preparation programme. *Teacher Development, 11*(2), 149–173.
Keogh, K. M. (2001). National strategies for the promotion of on-line learning in higher education. *European Journal of Education, 36*(2), 223–236.
Kvale, S. (1994). Ten standard objections to qualitative research interviews. *Journal of Phenomenological Psychology, 25*(2), 147–173.
Lamb, P., Sandberg, J., & Liesch, P. W. (2011). Small firm internationalisation unveiled through phenomenography. *Journal of International Business Studies, 42*(5), 672–693.
Lameras, P., Levy, P., Paraskakis, I., & Webber, S. (2012). Blended university teaching using virtual learning environments: Conceptions and approaches. *Instructional Science, 40*(1), 141–157.
Lawless, K. A., & Pellegrino, J. W. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns, and ways to pursue better questions and answers. *Review of Educational Research, 77*(4), 575–614.
Malik, S., & Shabbir, M. S. (2008). Perception of university students on self-directed learning through learning technology. *European Journal of Scientific Research, 24*(4), 567–574.

Marginson, S. (2004). Don't leave me hanging on the Anglophone: The potential for online distance higher education in the Asia-Pacific region. *Higher Education Quarterly, 58*(2–3), 74–113.

Marton, F. (1981). Phenomenography—Describing conceptions of the world around us. *Instructional science, 10*(2), 177–200.

Marton, F., Booth, S., & Booth, S. A. (1997). *Learning and Awareness Pr*. Mahwah, NJ: Routledge.

Marton, F., Dall'Alba, G., & Beaty, E. (1993). Conceptions of learning. *International Journal of Educational Research, 19*, 277–300.

McConnell, D., Hodgson, V., & Dirckinck-Holmfeld, L. (2012). Life behind the screen: Taking the academic online. In L. Dirckinck-Holmfeld, V. Hodgson, & D. McConnell (Eds.), *Exploring the theory, pedagogy and practice of networked learning* (pp. 3–24). New York: Springer.

McConnell, D., Zhao, J. (2006, December). Chinese higher education teachers' conceptions of e-Learning: Preliminary outcomes. In *Proceedings of the 23rd Annual Ascilite Conference: Who's Learning? Whose technology?* (pp. 513–523). The University of Sydney.

Nawaz, A., & Kundi, G. M. (2010). Predictor of e-learning development and use practices in higher education institutions (HEIs) of NWFP, Pakistan. *Journal of Science and Technology Education Research, 1*(3), 44–54.

Rienties, B., Brouwer, N., & Lygo-Baker, S. (2013). The effects of online professional development on higher education teachers' beliefs and intentions towards learning facilitation and technology. *Teaching and Teacher Education, 29*, 122–131.

Rienties, B., Kaper, W., Struyven, K., Tempelaar, D. T., Van Gastel, L., Vrancken, S., et al. (2012). A review of the role of Information Communication Technology and course design in transitional education practices. *Interactive Learning Environments, 20*(6), 563–581.

Roberts, G. (2003). Teaching using the web: Conceptions and approaches from a phenomenographic perspective. *Instructional Science, 31*(1–2), 127–150.

Ross, J. (2012). Just what is being reflected in online reflection? New literacies for new media learning practices. In L. Dirckinck-Holmfeld, V. Hodgson, & D. McConnell (Eds.), *Exploring the theory, pedagogy and practice of networked learning* (pp. 191–207). New York: Springer.

Sandberg, J. (2005). How do we justify knowledge produced within interpretive approaches? *Organizational Research Methods, 8*(1), 41–68.

Schofer, E., & Meyer, J. W. (2005). The worldwide expansion of higher education in the twentieth century. *American sociological review*, 70, 898–920.

Selwyn, N. (2012). Making sense of young people, education and digital technology: The role of sociological theory. *Oxford Review of Education, 38*(1), 81–96.

Shafique, F., & Mahmood, K. (2008). Indicators of the emerging information society in Pakistan. *Information Development-London, 24*(1), 66.

Shaikh, Z. A. (2009). Usage, acceptance, adoption, and diffusion of information & communication technologies in higher education: A measurement of critical factors. *Journal of Information Technology Impact, 9*(2), 63–80.

Sjöström, B., & Dahlgren, L. O. (2002). Applying phenomenography in nursing research. *Journal of Advanced Nursing, 40*(3), 339–345.

Trigwell, K. (2000). A phenomenographic interview on phenomenography. In J. A. Bowden & E. Walsh (Eds.), *Phenomenography* (Qualitative research methods series, pp. 43–57). Melbourne, VIC: RMIT University Press.