**'THE CASE OF THE EDUCATED METHODOLOGICAL STUDY':**

**AN EXPLORATION OF PUBLISHED TECHNOLOGY RELATED**

**RESEARCH CASE STUDIES**

Hazel BEADLE

Chichester Institute of Education

University of Chichester

United Kingdom

h.beadle@chi.ac.uk

**ABSTRACT**

This paper reports the findings of a methodological content analysis carried out on a total of 300 technology related research case studies which used a qualitative methodology and were published during the 2005 to 2014 time period. Reasons for using the case study approach were identified to be classifiable into one of eight categories and these categories could, furthermore, be grouped according to whether they focused on the nature of, the benefit to be derived from, or how the researcher might engage with, the case study. In considering how the methodological argument of the education based studies compared with those undertaken outside the education sector, there is identification of some favouring of the case study approach within journals publishing education based research; that the boundedness of the study was more likely to feature in education based studies as compared with other research; that the greatest variation between education based and other studies related to the intention to derive theory; and that there was a tendency towards lone working researchers making use of the case study approach within the education sector. Learning arising from this analysis relates to the credibility of using the case study approach for technology related research activity; the targeting of case study research articles toward journals which favour the approach; and the importance of rigor in the methodological explanation.

**INTRODUCTION**

The case study, as a research method, has a long and respected history which invariably features in the teaching of qualitative research methods to education practitioner researchers. The case study is generally accepted (e.g. Levine, 1996; Langley, 1999; Gephart, 2004; Gerring and McDermott, 2007; Thomas, 2009; Horn, 2009; Lyons, 2009; Welford et al, 2012; Parveen and Mehmood, 2013) to be a single, or limited, study which permits aspects of that case to be studied in depth. Methodologically the case study is described as being “...exploratory, descriptive, and explanatory research without turning to research designs that rely solely on the manipulation of variables” (Morris, 2006 p.140). By embracing what Edmondson and McManus (2007 p.1155) term 'real people, real problems, and real organizations', the case study is argued to be 'the most interesting' as well as offering 'one of the best (if not the best) of the bridges from rich qualitative evidence to mainstream deductive research' (Eisenhardt and Graebner, 2007 p.25).

Many technology related qualitative studies (e.g. Katic, 2008; Carcary, 2009; Sutton, 2011; Evangelista et al, 2013; Harambam et al, 2013; Merat and Bo, 2013; Banerjee, 2014; Beaudry and Gagnon, 2014; Mahzan and Lymer, 2014; Tambo, 2014) identify the pursuit of in depth understanding to be the primary reason for engaging with the approach. Eisenhardt (1989 p.534) explains this in terms of 'understanding the dynamics present within single settings'; what is also described in terms of being the 'how and why' (Leonard-Barton, 1990; Yin, 2014). Depth is achieved through multiple observations; what is on occasion referred to as 'within-case analysis' (Haverland, 2010 p.71).

Each setting, or case, is identified to be a self contained unit of examination; potentially a critical incident (March et al, 1991), the demonstration of a mass of interconnected choices (Siggelkow, 2001). Whilst examination across or using multiple cases occurs, the study of the single case offers the benefits of boundedness, specificity and contextualisation (Stake, 2005; Cohen, 2008). Indeed the presence of boundedness is a factor mentioned in accounts of qualitative technology related research (e.g. Niekerk et al, 2010; Kim and Hannafin, 2011). Boundedness is reasoned to be particularly appropriate when the case has the potential to offer significant insight (Eisenhardt, 1991; Siggelkow, 2007; Eisenhardt and Graebner, 2007). That insight often arises from the researcher having a deep interest in the case being studied, for example where the researcher is both teaching and undertaking research within the same context. The sustaining influence of interest, for example its contribution to stimulating further research activity, is noted (Bartunek et al, 2006). Indeed, the potential interest to be generated by the focal case study is highlighted in the explanation of research methods offered by a number of researchers writing about their qualitative technology related studies (e.g. Staples et al, 2005; Harvey et al, 2012; Hasan and Pfaff, 2012; Aylett, 2013; Harambam et al, 2013; Siyepu, 2013).

The practical elements of undertaking research activity are not overlooked in the research methods literature. Eisenhardt (1989 p.537) cites Pettigrew (1988) as noting, for example, that "given the limited number of cases which can usually be studied, it makes sense to choose cases such as extreme situations and polar types in which the process of interest is transparently observable". Many published technology related studies (e.g. Karlsson et al, 2010; Doganay and Ozturk, 2011; Beckman et al, 2014) have emphasised polarity to be a central feature in their selection of a focal case. Siggelkow (2007: 20) suggests, echoing a view shared by other writers (e.g. Gerring, 2007; Seawright and Gerring, 2008) that selection of a case study becomes appropriate when it permits the 'gain[ing of] certain insights that other organizations would not be able to provide'. Indeed many published technology related research studies (e.g. Bencze et al, 2009; Nenge et al, 2012; Breitenbach, 2013; Mellor et al, 2014; Micó and Casero-Ripollés, 2014) place emphasis on the uniqueness of the case they have examined, often explaining their approach using the term 'critical' (Yin, 2014 p. 51).

A practical influence on the choice of case study is the resourcing issue (Stake, 2005; Yin, 2014). This is a concern both for the researcher and for those involved with 'the case', for example the school. The exploratory nature of many studies identifies that much research is undertaken in order to, as Thomas (2009 p.115) terms it, 'understand it in itself’. Stake (2005 p.454) provides reminder that “enduring meanings come from encounter, and they are modified and reinforced by repeated encounter”.

Judging by the number of technology related researchers who explain their use of the case study is for exploratory purposes (e.g. Huang and Nakazawa, 2010; Ashworth, 2012; Anand and Monin, 2013; Ferreira et al, 2013; Bani-issa and Rempusheski, 2014; Bezboruah et al, 2014; Jasimuddin et al, 2014; Manresa-Yee et al, 2014), this is a popular approach. Exploratory studies emphasise a theory-building rather than theory-testing approach (Eisenhardt and Graebner, 2007; Gibbert et al, 2008; Greener, 2011; Svenonius, 2012; Yin, 2014) and many published research studies (e.g. Dickey, 2008; Bencze, 2010; Jones et al, 2012; Kuo-Pin and Graham, 2012; Mohlala et al, 2012; Perez et al, 2013; Dmitriev et al, 2014; Hossain, 2014; Sandeep and Ravishankar, 2014) use this theory-building terminology in explaining the methodological approach they have taken. The approach emphasises the development of an underpinning contextual-related understanding, what Dutton and Dukerich (1991 p.519) describe in terms of being 'a focus on issues as a starting point for interpretation and action'. Writing later, Gerring (2004, 2007) picks up on this starting point by highlighting that through incremental progression exploratory studies can lead to generalisation.

Exploratory studies are also reasoned as having the potential to ignite further research activity, contributing to a research momentum. Some technology based research studies (e.g. Carmichael and Farrell, 2012; Ochieng et al, 2014; Webster and Son, 2015) have placed active emphasis on their studies offering future research potential. Roberts and Pollitt (1994 p.528) provide useful explanation in highlighting that, “One case study doth not a comprehensive analysis make, but we hope that it can be illuminative and provocative of further research and discussion”. They indicate a momentum that might well be of significance in the education sector, especially amongst teaching practitioners, where there is a risk that other professional responsibilities will have a compromising impact on the research momentum. This risk of being distracted from the research task receives focus within the literature (Etherington, 2004; Chen and Anderson, 2008), with some acknowledgement that the distraction might well be related to the practising of the professional discipline (Newbury, 2002; Kingstone et al, 2003; Whiting, 2008).

With the increasing adoption of technology in education, it can be reasoned that consideration of using a technology related case study will have grown in popularity amongst school based practitioner researchers. Even within the limited word count of the academic journal article, some emphasis is placed on the appropriateness of selecting a case study approach. But how does the methodological argument of published technology related case study research within the education sector, publication being reasoned to offer a measure of research excellence, compare with that provided beyond the education sector? Furthermore, what learning can be extracted from this comparison which may add value to future education technology research activities? It is this gap which this paper makes a contribution towards filling.

**THE STUDY**

A methodological content analysis was carried out on a total of 300 technology related research case studies which used a qualitative methodology and were published during the 2005 to 2014 time period. The studied articles were written in English and were accessed using a University-provided 'one stop search tool' which searched 50 databases. Three search terms were used within the abstract filter; case stud\*, technolog\* and qualitative. The wildcard (\*) was used where alternative characters could be substituted e.g. case study and case studies, technology and technological. The retrieved articles were sorted by date, with the commencement date of 2005 and an end date of 2014, ensuring that the analysis was based on complete publication years. The published articles were classified as education or non-education based at the commencement of each analysis activity. For this purpose the title of the journal was the first to be examined. All articles published in an education based journal, for example those with the word (or a derivative of) education within the journal title were classified as education based. The article title was the next to be examined, followed by the abstract, the methodology and then the remainder of the article. The intention was to analyse at least 120 technology based research articles which used a case study approach within the education sector and to compare this with the approach used outside that sector. In total 300 technology based research articles which used a case study approach were analysed before this target was reached and the respective year's articles, as retrieved by the 'one-stop search tool', had been considered in their entirety.

The researcher focused on the methodological argument presented. In the main this was captured under a 'methods' heading. However each article was examined in its entirety in order to ensure the robustness of the examination undertaken. Reasons for using a case study approach, where provided, were gathered and analysed using an open coding approach.

**DATA AND FINDINGS**

The body of 300 technology related research case studies which used a qualitative methodology and were published during the 2005 to 2014 time period were drawn from a total of 231 journals. Those articles which had an education basis were drawn from 79 journals, with 32 percent of those journals seen to have published more than one article which met the search criteria. Non-education based articles were drawn from 152 journals, with 23 percent of those journals seen to have published more than one article which met the search criteria.

Over the studied time period there was an increase in the publication of technology related research case studies using a qualitative methodology. Whether this is the consequence of increased use of the approach per se, or increased favouring of the approach amongst those reviewing the research articles prior to publication, cannot be determined from this data. However, as illustrated in Figure 1, there was a significant increase in the use of the approach both within and outside the education sector between 2010 and 2012. Whilst latterly this tailed off within the education sector to a rate which appeared to be more in line with that seen during the 2007 to 2010 period, as at the end of the studied period use still appeared to be increasing outside of the education sector.

**Figure 1**: Published technology related research case studies using a qualitative methodology

Not all researchers are seen to have specifically identified in their article their reason for choosing the case study approach. Indeed, in total 42% (n=52) of the examined education based research articles and 38% (n=66) of the non-education based research articles failed to specifically identify why they had selected the case study approach for their research activity. Furthermore, for a significant part of the studied period, notably 2007 onwards, a measure of consistency in failing to identify this reasoning is identified both inside and outside of the education sector. In the case of the non-education sector, this amounted to 48% of the articles published between 2007 and 2014 failing to provide an explanation as to why a case study approach had been chosen. This is compared with 42% in the education sector.

Whilst this lack of detail might indicate a less than robust approach has been taken in providing detail for those seeking to examine the researchers' respective studies, further examination of the articles identified some inference to have been provided. Researchers might have intended that this inference should be used to rectify the identified gap. Illustrating this, seven examples drawn from the education sector were identified as drawing on cases where the researchers were already working with their studied student grouping, thus indicating that their studied case was both convenient and accessible. Some acknowledgement of this accessibility issue was also identified as being inferred in articles drawn from outside of the education sector.

'Already working with the studied case', and thereby having convenient access to data, was also noted to be a feature where explanations *were* specifically provided as to why a case study approach had been chosen. Fourteen articles mentioned already having access to the case study organisation. There did not appear to be any time related trends, although the approach was seen to receive some favour in articles published in 2012. The approach was, however, identified to be favoured by lone working researchers, with all but one (non-education) article citing this approach having been written by a single researcher. The single researcher tendency is in contrast to the aforementioned articles which simply provided inference that it was the convenience of working with the student grouping which accounted for their choice and where 57% of the articles were written by two or more researchers.

Where reasons for choosing the case study approach were identified, namely in 58% (n=73) of the education based articles and in 62% (n=109) of the non-education based articles, the principal reason fell into one of eight categories; the aforementioned accessibility of the data (by already working with the studied case); the boundedness of the study; in order to derive theory; the exploratory potential; that the case offered the potential to study phenomena in depth; polarity of cases; that the case offered the potential to study phenomena in a specific environment; and that the case was unique or demonstrated factors of particular interest. In that examination open coding was used, with the categories derived from the phraseology present in the articles. Identified from those categories was that the provided explanations focused on one of three elements; the nature of the case (for example in relation to polarity), what might be the benefit of the case (for example with regard to a desire to derive theory) and how the researcher might engage with the case (for example that it offered exploratory potential). Also identified was that some of the terms used in the explanations were loosely applied, for example 'derive theory' might well have been associated with 'refining theoretical proposition and develop grounded hypotheses' as one non-education article published in 2014 highlighted, but it appeared to often be used to simply identify a desire to generally enhance understanding; what might be termed 'theorising'. In contrast, other researchers who appeared to be theorising were seen to have used the simpler 'exploration' term. Thus whilst eight categories were identified, the way they were applied suggested that some blurring in the terminology being used may have occurred. The importance of this study having therefore considered the full article, and having focused on the principal reasoning offered, was thereby identified.

The accessibility of the data already having been discussed, each of the remaining categories are now examined:

*Study boundedness*

The boundedness of the study was identified as the least frequently used explanation for choosing a case study approach, being the central focus of just 4% of the explanations provided. This reasoning was marginally more likely to be associated with an education based study (63%), than outside this sector. No more than one article per year in either sector was identified as having provided this explanation and no less than two researchers were associated with any of the articles.

*In order to derive theory*

Explaining use of the case study as being associated with efforts to derive theory accounted for 17% of the explanations provided. Although this 'in order to derive theory' reasoning was used by 10% of education based articles which provided an explanation, and 6% of all the education articles sourced, outside of the education sector the approach was more popular. The 'in order to derive theory' explanation was used by 22% of non-education based articles which provided an explanation for use of a case study with, as seen from Figure 2, a general trend toward increasing use being made of this reasoning over the studied time period. Within the limited body of the education articles using this reasoning, 71% were written by lone researchers. This contrasts with 8% of lone researcher work outside the sector. Here, a two person team accounted for 50% and a three person team accounted for 29% of the articles citing the intention to derive theory.

**Figure 2**: Published non-education based technology related research case studies which explain a case study approach had been chosen to facilitate the deriving of theory

*The case study's exploratory potential*

The potential of the case study to facilitate exploration accounted for 32% of all the case study use explanations provided. Overall, there was a measure of consistency between the use of this reasoning in education sector articles (33%) and non-education articles (31%). However, as seen from Figure 3, there was variation in the use of this explanation over the studied time period, with the favouring of this approach within the body of education related articles decreasing following a peak in 2011. Outside the education sector, and since 2009, there has been a general trend towards increasing use of the approach. The approach appeared to be favoured where there were multiple researchers associated with a study, with 79% of the education and 82% of the non-education research articles examined citing the exploratory reasoning for using a case study approach, having two or more writers.

**Figure 3**: Percentage of published articles citing the potential of the case study to facilitate exploration

*Studying phenomena in depth*

Use of the argument that the case study approach permitted one or more specified phenomena to be examined in depth was used in 14% of the articles where an explanation was offered. This figure was likewise reflected when considering the percentage of explanations featuring this reasoning within, and outside, of the education sector. However, whilst the approach was seen to have had consistent, but limited, use in education based research throughout the studied period, until 2011 little use was made of the 'studying phenomena in depth' reasoning outside of the education sector. Since this point it has become increasingly popular. With just two exceptions when the approach was used by either a two person or three person writing team, it has been single researchers carrying out research within the education field who appear to have favoured using the 'studying phenomena in depth' explanation. This is in contrast to the non-education sector where 73% of the articles using this argument were from multiple writers; there being in one case as many as seven contributors.

*Polarity of the cases*

Behind the 'boundedness of the study' reasoning, the polarity of the examined cases was the least popular explanation for use of a case study approach. It did, nevertheless, account for almost 6% of the explanations provided; this being 4% and 6% of the explanations within the education and non-education sectors respectively. Limited use precluded identification of any arising trends, although it was seen that little use was made of the polarity argument before 2010. Furthermore and, in view of the limited number of studies citing this reasoning when considering both sectors together, there appeared to be equity of use of the approach across the researcher group sizes, extending from the lone researcher to a writing group of four. This largest group of researchers completed their study outside of the education sector.

*Studying phenomena in a specific environment*

An argument that the case study permitted the studying of a phenomenon in a specific environment was provided in 10% of the articles offering an explanation for case study use. In comparison with the non-education sector where it was offered in 7% of the provided explanations, use within the education sector was more significant. This said, the 14% of provided education research based explanations which made use of this reasoning, was significantly less than that which argued the case study facilitated exploration (33%). Whereas the eight examples identified from non-education sector research were distributed evenly across the years 2011 to 2014, the education sector tended towards a more consistent use of the approach over the examined 10 year period. Furthermore, in contrast with a tendency towards small researcher group writing, studies citing the potential to study a phenomenon in a specific educational environment were identified as having been written by groups of two, three or four writers. Additionally, there was one education based article prepared by a group of seven researchers. The non-education sector took a similar approach; an approach not dissimilar to that seen in other categories such as where it was reasoned that a case study approach was taken in order to study a phenomenon in depth.

*Uniqueness of the case*

Ten percent of the explanations offered for using a case study approach were encapsulated within a 'unique or interesting case' categorisation. This amounted to 6% of education based articles, compared with 13% of non-education based research. It might be questioned whether this is reflective of the nature of education based research with regard to equity of educational opportunity and thus provision. The limited volume of education related studies precluded significant trends being identified but it was seen that the number of researchers contributing to those education based studies was never less than three in number. In contrast, the non-education sector research articles tended towards smaller group writing with 50% of the articles written by a lone researcher. The significance of this data is apparent in the light of the number of non-education based studies where collaborative writing activity was apparent, as seen in Figure 4. Furthermore, and as also seen from that figure, the published education based studies appeared to favour smaller numbers of researchers collaborating on any one study for the purpose of academic writing; usually 3 or less individuals. Education context researchers appeared to be more likely to be lone writing researchers than their non-education contemporaries and less likely to participate in large group (5 or more researcher) writing activities.

**Figure 4**: The number of researchers contributing to the research article illustrated as a percentage of the case study research articles published within the respective sector

**DISCUSSION**

Potentially serving to perpetuate its long and respected history as a methodological tool, this study has identified the case study approach to be regarded as an appropriate tool for use in publishable technology related research. Thus it is reasoned that a favouring of the use of the case study approach should not preclude the researcher from achieving publication status. However, whilst the case study approach might be being actively used, the distribution of the 300 related articles amongst 231 journals brings into question the popularity of the approach and suggests that the case study using researcher might wish to target their work toward the interests of the publications which have previously demonstrated a favouring of the use of the case study. This study identified that 79 journals had published 125 education based technology related research studies which made use of a case study approach. Whilst the nature of education research is likely to result in the education researcher focusing on education based journals, in the light of increasing interest in the case study method for technology related studies outside the sector, there might well be merit in considering an extension of the trawl of potential journals to include those beyond the education based boundary. This extended approach might also serve to exemplify the nature and relevance of research undertaken within the education sector and thus additionally fulfill a profile raising function.

Not all researchers specifically state their reason for using a case study mechanism, and this appears to be an increasingly popular approach both within and outside the education sector. By the researcher failing to provide this detail the reader might well be being forced to engage in speculative activity. Furthermore, whilst this speculative role might be based on reasoned assumptions, potentially fuelled by reflection on what other detail is provided within the article, there remains a risk to the article's message; the researcher's intention of conveying findings or argument, and thus adding to the body of knowledge, being central to the publication endeavour. The researcher might be well advised to be proactive in seeking to close this gap with case study detail offered within a methods section.

Further compromise in the contribution offered by an article may arise as a consequence of the variance identified in this study of the meaning associated with the terms used; again a factor apparent both within the education sector and spanning that sector's boundary. It is reasoned that since this variance is identified within the published material using the same language, English, the compromising impact of liberal application of terminology risks being all the more pronounced when English is, for the reader, a second language. Since researchers have an obligation to convey their findings, and thus their contribution to the body of knowledge, with integrity; an awareness of, and effort to mitigate, the potential for variance should feature as part of their method considerations.

Reasons for using the case study approach were identified from the case studies examined to fall into one of eight categories - accessibility of the data (by already working with the studied case); the boundedness of the study; in order to derive theory; the exploratory potential; that the case offered the potential to study phenomena in depth; polarity of cases; that the case offered the potential to study phenomena in a specific environment; and that the case was unique or demonstrated factors of particular interest. Some parallel here with, and by way of example, the aforementioned 'exploratory, descriptive, and explanatory' terminology used by Morris (2006 p.140), 'critical incident' terminology used by March et al (1991) and 'boundedness' term used by Stake (2005) and Cohen (2008) in describing the case study, together with the debate surrounding interest generated by Eisenhardt and Graebner (2007), is evident.

Since the categories, through a process of open coding, were derived from the phraseology used in the articles, it appears that the respective researchers not only possessed some familiarity with the arguments presented within the research methods literature but that they were also desirous of embracing the sentiment of this literature within their research practice. Whilst this scenario appears to be positive, a desired state, and might be the consequence of the approach taken to the teaching of research methods, it is an approach that may account for the identified loose application of terminology and thus some compromising of clarity. The aforementioned example of the breadth associated with the 'deriving theory' explanation of case study use is an example. Furthermore, it was also identified that there was some variance in the frequency with which these categories featured as well as there being a variance between the education sector and non-education sector with regard to categorisation. Offering insight, not least because of the clarity it offers in the presence of the potential for a blurring of cited categories, is identification that the provided explanations tended to focus on one of three elements; the nature of the case, the potential benefit of the case and how the researcher might engage with the case.

It is acknowledged that the nature of the study might well have been of influence with regard to comparison of a defined (education) environment as compared with the context of a broader range of technology related studies using a case study approach. The literature was noted not to have overlooked the practical elements of undertaking research activities. 'Study boundedness', the opportunity to study 'phenomena in a specific environment', and to a lesser extent the 'polarity of the cases', all have the potential to be influenced by the reality of the education environment, noting there to be a general influence on the researcher to work with the material which is available to them and that the appropriateness of any case study choice is linked to the potential for deriving insight.

What might initially be perceived as being the lesser valued case - as a consequence of being, for example, commonplace - might prove to offer significant insight or impact. The case has the potential to offer what Dutton and Dukerich (1991 p.519) term the 'starting point for interpretation and action'. This is the consequence of the feasibility of undertaking the research task and associated activities, such as the potential to 'return' to the studied environment for the purpose of achieving clarification or additional data. Multiple observations offer the potential for 'within-case analysis' (Haverland, 2010 p.71). The researcher may have a particular interest in the case being examined as a consequence, for example, of it being both the researched and teaching environment. Regardless of whether the bounded term is specifically used, the sentiment behind such an approach within an educational setting encapsulates what Edmondson and McManus (2007 p.1155) term 'real organisations' and may go some way to explain why, for example, boundedness has been found to be marginally more likely to feature in education based studies as compared with other research. It would be speculative to suggest that the potential for the case study to be perceived by others as being of lesser value may have contributed to some researchers avoiding the inclusion in their article of a specific statement of their reason for using a case study approach, nevertheless this remains an avenue for exploration.

The nature of the environment available for examination can also be reasoned to explain why it is more likely that lone working researchers will undertake education based research using a case study approach, as compared with other sectors. In the absence of the influence of a team effort, increased reliance is placed on inherent motivation and some of that motivation may arise from an 'in situ' examination within, for example, their teaching environment. Whilst ensuring the integrity of the data, consequent to potential influence exerted by the researcher's presence, is a prerequisite, and reasoned to feature amongst ethical considerations, through the elimination of distance the influence of distraction might be mitigated. That distraction might well be related to the practicing of the professional discipline is noted within the literature (Newbury, 2002; Kingstone et al, 2003; Whiting, 2008). Research momentum, furthermore, has the potential to ignite further research activity.

**CONCLUSIONS**

The intention of this paper was two-fold. Firstly, how it sought to identify how the methodological argument of published technology related case study research within the education sector compared with that provided beyond the education sector. Secondly, it sought to identify what learning can be extracted from this comparison and which might add value to future education technology related research activities.

In relation to publication of technology related research case studies using a qualitative methodology within the education sector, as compared with other sectors, the data gathered from the 2005 to 2014 time period identified there to be journals which favoured use of the case study approach and that this appeared to be more significant amongst studies with an educational underpinning as compared with those outside the education sector. Furthermore, the study highlighted there had been a general increase in the publication of technology related studies underpinned by the use of the case study although with regard to education based research, following a peak in 2012, there has been a return to a level equating to the 2008-2010 period.

Not all writers stated why they had selected a case study approach; a practice showing some commonality across the education sector boundary. However, where reasons for using a case study approach were provided, the meaning associated with the terminology which was used varied. This variance was a factor both within and spanning the education sector boundary. This acknowledged, and using the detail which accompanied any provided reason for the purpose of clarification, those reasons were capable of being classified into one of eight categories - accessibility of the data (for example by already working with the studied case); the boundedness of the study; in order to derive theory; the exploratory potential; that the case offered the potential to study phenomena in depth; polarity of cases; that the case offered the potential to study phenomena in a specific environment; and that the case was unique or demonstrated factors of particular interest. Furthermore, where reasons for using a case study approach were provided, and taking the studied ten year period as a whole, the least likely reason for using the approach was because the case study was bounded, although this appeared marginally more likely to feature in education based studies as compared with other research. The most popular reason related to the case study offering exploratory potential. Here there was a measure of consistency between the use of this reasoning in education sector research (expressed in 33% of articles) as compared with non-education articles (31%). The greatest variation between education and non-education based studies occurred in relation to a desire to use a case study in order to derive theory. Here just 10% of education based research which provided reasoning for using the case study approach, as compared with 22% of non-education related articles, indicated an expressed intention.

Lone working researchers were more likely to be found undertaking education based technology research using a case study approach, as compared with other sectors. However the reasons for using a case study approach, both within and outside the education sector, are identified as being related to the nature of, the benefit to be derived from, and how the researcher might engage with, the case being studied.

In relation to the learning which can be extracted from this comparison, the case study approach has been identified as being regarded to be appropriate for use in technology related research activity and simply choosing to use the case study approach should not preclude the researcher from achieving publication status. The case study is, therefore, a method which the education based researcher might wish to consider as they plan their technology related research activity using a qualitative methodology. However, whilst many journals were seen from this study to have accepted for publication technology related research articles which made use of a case study method, the more limited popularity of the approach indicates that the researcher might wish to target their work toward the interests of the publications which have previously demonstrated having favoured use of the case study approach and this need not be limited to those journals within the education sector. Furthermore, this approach might serve to exemplify the broader relevance of research undertaken within the education sector and thus additionally fulfill a profile raising function.

Failure of the researcher to specifically state their reason for using the case study method and/or the meaning associated with the explanatory terms used, risks engaging the reader in speculative activity. Since speculation risks both detracting from the message being conveyed and undermining the integrity associated with the researcher role, the researcher might be well advised to be proactive in seeking to close this gap through the detail offered within their study's methods section. The favouring of active use of terminology used within the research methods literature is apparent and has the potential to offer a benchmark for understanding. Furthermore, the researcher might find it helpful, in the formulation of their research framework, to identify whether it is the nature of the case, the potential benefit of the case or how they, as the researcher, might engage with the case, which is of significance.

Whilst insight into the case study being examined will aid the researcher's clarity in providing the methodological argument, the educational based researcher should not be surprised if in reasoning their approach there is variance with the argument used in other technology related research activities; particularly when compared to activities occurring outside the education sector. These differences might well be the consequence of the examined context and the potential, for example, for practitioner researchers to be both researching and teaching in the same environment.

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