Sharing methodology: A worked example of theoretical integration with qualitative data to clarify practical understanding of learning and generate new theoretical development

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Abstract

Background: Theoretical integration is a necessary element of study design if clarification of experiential learning is to be achieved. There are few published examples demonstrating how this can be achieved.

Aims: This methodological article provides a worked example of research methodology that achieved clarification of authentic early experiences (AEEs) through a bi-directional approach to theory and data.

Methods: Bi-directional refers to our simultaneous use of theory to guide and interrogate empirical data and the use of empirical data to refine theory. We explain the five steps of our methodological approach: (1) understanding the context; (2) critique on existing applications of socio-cultural models to inform study design; (3) data generation; (4) analysis and interpretation and (5) theoretical development through a novel application of Métis.

Results: These steps resulted in understanding of how and why different outcomes arose from students participating in AEE. Our approach offers a mechanism for clarification without which evidence-based effective ways to maximise constructive learning cannot be developed. In our example it also contributed to greater theoretical understanding of the influence of social interactions.

Conclusion: By sharing this example of research undertaken to develop both theory and educational practice we hope to assist others seeking to conduct similar research.

Introduction

There are few published methodological examples that describe in detail how to integrate theoretical perspectives into empirical study designs in Medical Education. This is despite an identified need. Regehr (2010) has argued that it is necessary to re-orientate education research towards an ‘imperative of understanding’ which represents the complexity of in situ learning opportunities. Cook et al. (2008) have suggested that there is a need for clarification research in Medical Education to refine understanding. It is necessary for medical education researchers to explicitly engage with methodological (and other) theories in their empirical study designs to meet these aims (Rees & Monrouxe 2010).

The purpose of this article is to share with others in the field a specific example of how one might attempt to move from the common discourse within the medical education field bemoaning the lack of theoretical and empirical integration to conducting a research study incorporating both theory and empirical works into an integrated interpretative analysis.

Practice points

- Theoretical integration is a necessary element of study design if clarification of experiential learning is to be achieved.
- This article presents a successful bi-directional approach to integrating theoretical and empirical works in a research project to clarify the outcomes of educational opportunities.
- Use of multiple qualitative research methods can provide theoretical and practical approaches for understanding complex educational experiences in Medical Education.
- Methodological examples are required if Medical Education researchers are to develop their field.
- Key elements of our approach are presented to assist researchers new to Medical Education in the development of their own work.
This is a methodological article in which we describe and discuss our approach to the use of multiple qualitative methods within a theoretical framework when conducting research in Medical Education. We present five steps which were successfully used to clarify and expand understanding of authentic early experiences (AEEs).

AEE is defined as any experience that requires students to generate learning from human interactions in clinical and social workplaces during short placements (Littlewood et al. 2005). Distinct characteristics of the definition are as follows: authenticity refers to interaction of medical students with real patients or members of the public, in genuine contexts. The contact may take place in a health or social setting – thereby including community and hospital environments, and the public, private and voluntary sectors. The students are in the first two years of undergraduate medical education (in the United Kingdom (UK) or the international equivalent elsewhere). The resultant learning should be about health, lack of health and the future role the student might have (or the roles of those with whom they interact). AEE is, therefore, a form of experiential learning (Yardley et al. 2012).

A combination of personal interest, suitable opportunity and dissatisfaction with current literature had brought AEE into focus as the subject for further study. Variance between workplaces and the importance of human interactions during experiences led us to consider AEE as a non-uniform complex learning opportunity. In the literature, the majority of existing studies related to AEE reported isolated achievement of pre-determined intended learning outcomes. The few (four out of 60 studies) which referenced theories contained only one study where theoretical constructs and empirical work had been truly integrated (Niemi 1997; Dornan et al. 2006; Yardley et al. 2010; Yardley 2011). Therefore, we hope this article will be particularly of use to researchers new in the field of Medical Education who want to ensure their work is grounded in appropriately applied theory. A worked example from our research regarding the consequences of AEE illustrates the methodology. As our aim is to present methodology we have deviated from the traditional Introduction, Methods, Results and Discussion (IMRAD) format for this article. Instead our worked example is integrated to illustrate each step of the methods used, and step-related discussion is also integrated into this part of the text. The ‘result’ of our exemplar research approach was a successful doctoral thesis in Medical Education (Yardley 2011). Readers interested in the content of the findings produced as a result of using the methodologies described in this article are directed to two separate peer-reviewed publications (Yardley et al. in press; Yardley et al. in press). These tangible ‘results’ provide both clarification of AEE as experienced by students and development of theoretical perspectives related to AEE.

Conceptual orientation

Our research approach accepts two underlying premises. First, educational experiences are complex: multiple variables connect in a non-linear, dynamic way, effects are not always attributable or proportionate to specific causes and organisational history can have lasting and hidden influences on learning (Radford 2006). Second, social processes work in ways more complex than schemata devised to map them (Scott 1998). Our conceptual orientation is towards the principles of constructionism, interactionism and interpretivism. People act towards things based on the meaning those things have for them; and these meanings are derived from social interaction and modified through interpretation (Blumer 1969). Interpretation of meaning leads individuals to act in a given way; further encounters lead individuals to modify their interpretations of meaning (Blumer 1969). Therefore the meanings people ascribe to events are of concern (Smith 1996).

We acknowledge that the use of mixed qualitative tools alongside multiple theoretical perspectives to achieve an interpretative analysis that remains embedded in the original data is a relatively innovative approach within medical education research. All of the theoretical and methodological approaches underpinning the study can be traced back to shared foundations in interpretative – constructionist epistemologies. The choices made regarding data collection methods and populations retained consistency with the overall research approach, as described through our research questions, the theoretical work and epistemological alignment with interpretivism and constructionism. It was a logical process, guided by the concept of Mētis (see below) as a potential explanation of gaps in previous theoretical and empirical studies, and refined as the various types of empirical data emerging were identified.

Objectives

The purpose of our research was to understand knowledge construction and meaning-making undertaken by new (year one and two) undergraduate medical students as a consequence of AEE. Prior to our work little was known about actual, rather than ideal, processes of AEE, and a holistic view of the consequences arising from AEE was lacking in educational literature (Dornan et al. 2006; Yardley et al. 2010). The purpose of this article, however, is to provide an example of how we took a bi-directional approach to theoretical and empirical research to reach an interpretative analysis. Bi-directional refers to our simultaneous use of theory to guide and interrogate empirical data and the use of empirical data to refine theory. A bi-directional approach is necessary to generate interpretations that are of use for learners and teachers engaged in educational activities. Researchers who wish to integrate theory with empirical work have a multitude of theoretical perspectives that they might draw on.

Methods

This research was peer reviewed and received prospective ethical approval. SY was granted access to the medical school in which the work was conducted through a doctoral scholarship. We have not focused on issues related to access, and ethical approval processes for medical education research as these are discussed in detail elsewhere (Pugsley & Dornan 2007). A flowchart of the study design and processes is available from the corresponding author and will soon be available online (Yardley et al. in press).

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Therefore, choices have to be made. These choices should be transparent and logical given the question which the research is to address. Particular theoretical perspectives will also be compatible with particular methodologies. We chose to work with Métis (Scott 1998, see below) because it resonated with the emergent findings from our empirical data. Métis offers a mechanism for understanding gaps between perceived realities of AEE and the ideal or aspirational aims offered by theories of experiential learning for the design of AEE. We recognise that neither Métis nor any other theory can be claimed to be the sole approach but also that the use of any theory functions as a tool with which to develop an interpretative analysis.

Dialogue can be created through research methodologies which allow a reflexive researcher to act as the interpretive link between existing theory and empirical research. Scott does not prescribe any particular method for the application of Métis in new fields or disciplines. What he clearly identifies, nevertheless, is that addressing questions regarding the existence of Métis, or its content, requires data that can enlighten how those of primary interest (in our case, students) conceptualise their situation in relation to other agents and structures. Therefore, an iterative analysis was developed based on the roots of these theories in the philosophies of constructionism and interpretative interactionism. This facilitated a deeper and richer interpretation than a single approach would have produced. If one is attempting to gain understanding of complex interactions between both multiple agents and multiple structures then using different but complementary methods to interpret data is a logical step (Corbin & Strauss 2008). The practical approaches were chosen to provide analytic tools which had resonance with my theoretical stance and research questions, and were sensitive to the empirical data generated (Corbin & Strauss 2008).

**Setting**

Our research was conducted in the context of a new curriculum at a UK medical school. Within the school AEE was an activity which formed part of the ‘experiential learning’ strand of the curriculum. Students were allocated to six to eight half day placements in medical, social and voluntary sector workplaces for AEE. Each placement had broadly defined objectives, for example, to observe how professional–patient interactions were conducted. AEE was intended to encourage students to consider community and social dimensions of illness and health as well as to integrate scientific knowledge with patient perspectives in a hybrid curriculum that included problem-based learning.

The actions we took to explore AEE using mixed qualitative methods are now explained step-by-step. We have dissected out these steps in order to present the fundamental elements of the process we undertook. Taking the five steps in turn, we started with immersion in the field (empirical) and a review of existing empirical literature. Step two returned us to theoretical work as we critiqued on common applications of sociocultural models within our area of interest. We then returned to the field to generate new empirical data while basing our methods for this and later analysis within our methodological approach which was theoretically derived according to our theoretical conceptual framework. Following our analysis we were then able to develop theory through dialogue with our empirical findings. In reality, there was overlap between one step and the next, and movement to and fro including return to previous steps as we took a critical, reflexive and non-linear approach to our work in keeping with our conceptual orientation.

**Step 1:** Understanding the context (research field) through literature and immersion

It is standard practice for researchers to review existing literature prior to commencing new empirical work. When conducting research using a bi-directional approach it is important that the literature review includes both existing knowledge about the subject (in our case, AEE) and a critical consideration of how relevant theories have been previously applied to this subject. Conducting these two strands of literature review allows the researcher to identify gaps between theoretical and education practice-based perspectives. Exploration of discrepancies between these perspectives by researchers can contribute to clarification of practice and theoretical development.

In our work, an extensive (and collaborative) review of subject literature identified the need to understand how and why AEE leads to learning and to identify what was essential to make it a more effective process (Yardley et al. 2010; Yardley 2011). We developed two related research questions to address through the methods described in this article: first, ‘how and why do students construct useful knowledge and meaning-making from AEE?’ and second, ‘How and why do students make early experiences work for them?’. The term ‘work’ was eventually (see below regarding our iterative movements between theory and empirical data) defined using Scott’s theory of Métis (Scott 1998) to mean what it was like to ‘experience the experiences’ regardless of positive or negative outcomes, and to also encompass student conceptualisations of AEE with respect to their own purposes as agents in social interactions, whatever these might be.

SY was immersed in the daily life of the medical school in her role as a researcher. This offered opportunities to develop understanding and collect informal data through the use of observation and keeping of a field diary which was used to inform development of the formal research proposal alongside our literature review. Through the observation of local educational practice it became increasingly evident that two areas were of particular interest: first, the dynamic social interactions between students, members of the medical school faculty and workplace-based experience providers of AEE, and second, how each of these groups conceptualised AEE, themselves, each other and the institutions involved. A research proposal was, therefore, developed which provided for sequential recruitment and interviewing of individuals within each of these groups. Initially we selected individual interviews for data generation to allow students the opportunity to present their personal meaning-making and knowledge construction without experiencing potential pressure (implicit or explicit) to tell a certain type of narrative from their peers. Accompanying supportive documents such as
information leaflets for participants and consent forms were produced according to National Health Service guidelines (National Patient Safety Agency 2011). More details of the empirical arm of the study are given in Steps 3 and 4.

**Step 2:** Theoretical work: A critique on common application of socio-cultural models in medical education to inform our empirical study design

The theoretical conceptual framework developed for this study provided the rationale for the multi-method qualitative analysis used to conduct empirical work. This approach facilitates clarification and deepening of understanding with respect to the real-life experiences of students as a consequence of AEE. Current application of socio-cultural theories was considered by undertaking a critical analysis of how Situated Learning (Lave & Wenger 1991) and Activity Theory (Engeström 2005) had been applied within Medical Education research. These examples were chosen because we had noted increasing interest in citing these particular theories as explanation of positive findings in the medical education research community.

Situated Learning in Communities of Practice and Legitimate Peripheral Participation form a theory of how vocational learning should work, but not necessarily a theory of how AEE does work. Lave and Wenger (1991) take care to emphasise that resistance on the part of existing practitioners to the legitimacy and inclusion of new learners can subvert the process. This can be communicated in a variety of ways, of which language is often the mediator. Activity theory contains three key ideas: first, accepting that interaction will occur between people and contexts mediated by multiple influences; second, that learning is a collective activity and third, that conceptual tools need to ‘understand dialogue, multiple perspectives, and networks of interacting activity systems’ (Engeström 2005). Neither theory considers in detail what uses learners choose to put their knowledge too, why these choices are made or what affect this has within on-going interactions and experiences (Arnseth 2008). Shortcomings in the application of these theories provided the basis for seeking alternative theoretical understanding; this was drawn from the concept of Métis (Scott 1998). It should be noted that we are not suggesting Métis was the only theory which we might have used. Rather, through dialogue with colleagues in a variety of disciplines and review of the wider literature within constructionist traditions we decided it was the most appropriate choice to guide an analysis that would challenge assumptions and offer a holistic interpretation of the consequences arising from AEE.

Métis is defined as the practical knowledge that people use when interacting in circumstances defined by institutional agencies. ‘Practical knowledge’ encompasses both necessary skills and ‘acquired intelligence’ used to act according to one’s own purposes (Scott 1998). Métis offers a theoretical framework for considering how people create meaning, when and how they choose to use it and value it, in relation to formally recognised knowledge. It is a theory of the ‘gaps’ between theories of what should happen in any sort of practice and what does happen. It acknowledges the potential student role in the creation of meaning from AEE and provides a framework for considering processes which might result in many consequences (Yardley 2011), some of which will have been neither predicted nor intended. As such it recognises, acknowledges and respects social interactions which are complex.

Prescriptive guidelines for practical data management are omitted from all the theories discussed above. Therefore, the next step in the research process was to develop an iterative approach congruent with these theoretical principles whilst also allowing the empirical data to shape the interpretation. This was particularly important with respect to the analysis of the data generated from our research participants which by its nature contained subjective conceptualisations of reality.

**Step 3:** Empirical data generation and selection of methods for analysis

Interviews and discussion groups (with students sharing emergent results $n = 26$, divided by year and previous participation) were used to identify social processes underpinning knowledge and meaning-making of students as they entered a medical world. Interviews of students ($n = 23$), faculty ($n = 13$) and placement providers ($n = 20$) followed purposive sampling. These methods provide means of constructing knowledge which is relational, conversational, contextual and language-based (Mishler 1986; Kvale & Brinkman 2009; Bunniss & Kelly 2010). Audio-recording with verbatim transcription was used. Concurrent analysis based on theoretical principles was conducted whilst allowing the data generated to shape choice of analytic tools. Three complementary overarching data types were generated: phenomenological themes, narrative (content and structure/language) and presented meaning.

A semi-structured interview schedule was designed to cover expectations, processes and consequences of AEE from the perspectives of each of the three participant groups. This was achieved through a sequence of topic areas including stories of experiences, learning of content knowledge, achieving functional knowledge and transfer of knowledge (Norman 2009). Interviews with workplace supervisors and medical school faculty allowed identification of dynamic interactions between groups.

A longitudinal element to the research was achieved through the use of small group discussions with students (following interview analysis) during which emerging interpretations were discussed. These discussions were guided by presenting back to students a series of thought provoking quotations from each group of interviewees. Quotations covered issues related to student role; gaining knowledge; debriefing; importance in the curriculum, student feedback; challenges; expectations; interactions with placement providers and patient stories.

We have used the term 'discussion groups' (Langridge & Hagger-Johnson 2009) because it is a descriptive term for the generation of data through formally arranged groups of students which involved discussion (between participants) of emergent findings incorporating the generation of data related to content and/or interactions. As such the discussion groups can be conceptualised as a hybrid method between group interviews and focus groups, bearing similarities to each (Mitchell 1999). Discussion groups have been previously used
in healthcare settings (Alderson et al. 2002; Williams et al. 2007). These groups were designed to complement the data generation from individual interviews with specific functions as follows (Frey & Fontana 1991). First, we could close the loop by allowing previous student participants to see and comment on findings emergent from their own as well as placement provider and faculty interviews. New student participants’ perspectives were also gained on the previous data from all three groups (Kvale & Brinkman 2009) including the discussion of contrasting views of their peers to reach consensus or not. Second, we could test out interpretations of points of tension or disagreement and understanding or agreement from the student perspective (Morgan 1997). Third, observation of interactions between students provided understanding of collective meaning-making as a group which complemented the understanding of meaning-making derived from the individual student interviews (Morgan 1997). Fourth, the students previously interviewed re-participated, approximately a year later, to allow reflection on their previous involvement and whether they had changed their thoughts or not (Boulton & Fitzpatrick 1994; Kitzinger 1994; Morgan 1996).

Our practical analytic tools were drawn from thematic (identification of content), narrative (identification of the story being told) and discourse (what can be understood from the language used by the participants?), and interpretative (what does the meaning created by participants signify?) approaches. The use of these is discussed in Step 4, with references provided for readers who wish to learn more about each individual tool. Opting for multiple approaches to data analysis, increases the trustworthiness of findings by providing inbuilt checks on interpretations through multiple perspectives, in addition to our use of data from different participant groups at sequential time points, and checking interpretations with student participants. We are not, in this article, seeking to provide an in-depth description of each individual method used as a tool within our analysis. Rather, we are outlining these methods illustrated with an example finding to demonstrate how each acted as a tool to enrich our overall analysis.

**Step 4: Conducting the analysis and interpretation**

The transcripts were subject to manual analysis, although NVivo 8™ computer software (QSR International 2008) was used to support this. Student data were subjected to the following steps:

1. Audio recordings were reviewed, alongside immediate reflections (field notes) from the interview, shortly after it was conducted, making notes of key points.
2. Transcripts were: checked for accuracy and if necessary corrected against the audio recording; subjected to thematic analysis using NVivo 8™ to compare the emergent codes and previous transcripts were ‘back coded’ if new codes emerged and analysed interpretatively by hand noting use of language, metaphors, explicit and implied meanings, and considering what these meanings revealed.
3. The interpretation was summarised using the following questions as a guide: What is happening in this interview? – Are there any overarching patterns?

How does the student’s ‘story’ unfold? How does the student structure what they say? Are there ‘inconsistencies/ambiguities/ambivalences’ about the student’s experience? What language, feelings, emotions and actions do they discuss? Did the student ‘discover things’ in the interview? How do students see interaction (or lack of it)? Can particular underlying social processes be identified?

While the first of these analytic steps might be considered to be a form of ‘data management’, the other two analytic steps are directly derived from our theoretical framework. A comparable analysis was conducted with experience provider and faculty data retaining the focus on what these alternative perspectives contributed to understanding the students’ experiences. To illustrate the contributions of each analytical approach these are discussed in turn as related to one example of an emergent finding, that of students’ conceptualisations of themselves as ‘spare parts’.

**Thematic analysis**

Thematic analysis offers a practical approach for identifying both anticipated and emergent themes from interview data (Ziebland & McPherson 2006). It was used to identify the breadth as well as the depth of the themes which participants (particularly the students) prioritised to talk about in their interviews. This allowed the analysis to remain sensitive to the student participants’ priorities and their stance on what was considered significant. Due to the lack of suitable coding headings in the existing literature, one was developed in vivo from the student interview transcripts. This approach has been used in other areas of medical education research to develop coding into a framework of themes and sub-themes (Cleland et al. 2008). Although this method was essentially iterative and the evolving framework developed primarily from the data it follows the principles outlined by both Huberman and Miles (2002) and Corbin and Strauss (2008) for the management of qualitative data analysis. This approach is recognised as valuable, particularly if also enriched with linguistic and narrative analyses (Ziebland & McPherson 2006; C. Rees et al. 2007). During the process of thematic analysis ‘students as spare parts’ was identified as an emergent theme in the empirical data.

Use of thematic analysis facilitated creation of an overview of how early experience placements were conceptualised by participants through four levels of coding (the complete coding framework is available on request from the corresponding author). Figure 1 illustrates a part of the process, taking the example of ‘being a spare part’ which emerged from our data. The levels of coding were: level 1 – individual codes developed in vivo; level 2 – sub-themes; level 3 – overarching themes and level 4 – overarching categories.

The code ‘being useful versus being a spare part’ was identified along with the other codes at level 1 to belong to a sub-theme of ‘expectations’ regarding AEE. Expectations could form either barriers or facilitators to learning during individual AEE placements and this became one of the overarching themes within the phenomenological category. The transcripts of the discussion groups were coded into four themes: expectations, process and perceptions, consequences and
elaboration of meaning. These themes reflect the purposes of conducting the discussion groups as explained in the ‘data generation’ step above.

Narrative and discourse analysis

The identification of significant experiences can be made through listening to what is memorable and described in detail by participants, alongside the tone and manner in which the story is told (Webster & Mertova 2007). These stories may also be used by participants to support later choices, or explain shifting relationships and interactions with others (Hunter 2008). The storyteller may also assign positions to others in a story (e.g. for me or against me, novice or expert). As such stories can be considered as a symbolic tool for creating identity through social interactions (Riessman 2008).

Vygotsky noted that the social interaction was often ignored in language about learning (Wertsch 1991). This observation draws attention to the importance of paying attention to not just what is said, but how and why, it is said, in order to more fully understand the meaning which the speaker is intending, and what in turn that means for them. This can be addressed through discourse analysis focused on the use of metaphors. Metaphor is defined as understanding one conceptual domain (the target domain) in terms of another conceptual domain (the source domain), which leads to the identification of a conceptual metaphor (Rees et al. 2009). Identification of metaphors combined with identifying specific uses of language allows the identification of how students (and others) are constructing their roles, identity and meaning from their experiences (Monrouxe et al. 2009). Through language analysis particular challenges or changes to current or desired identities and roles can be detected. These challenges can then be interpreted with an emphasis on seeking to understand meaning to the participants (Monrouxe 2010). Common metaphors previously found in the field of medical education include war, hierarchy, doctor – centeredness, market, machine and theatre (Rees et al. 2007).

Figure 2 shows two data samples extracted from longer narratives which use the metaphor of being a ‘spare part’. Both quotations are from students. These quotations are illustrative of ‘spare part’ as the commonest metaphor in the data used by students to describe their roles during AEE, positioned as outsiders to the purposes of the workplaces within which their experiences were situated. Analysing when, how and why the students use this metaphor moves the analytic process from identifying and describing the ‘spare part’ phenomenon to interpreting how and why this phenomenon occurs.

Attention to the narrative and discourse of these two students demonstrates that they offer individual reasons for their use of the metaphor. M1I7 suggests that they need to be able to contribute something useful to others within the workplace in order to have a role. R6 (in the discussion group) suggests the issue is not so much with them but with a lack of responsibility for them and, perhaps, conferred legitimacy in workplaces. Identifying these nuances in the language of student narratives enriched the data analysis beyond identification of the spare part code alone. Language also forms a significant role in the development of Metis. Language can be used to distinguish what is privileged, local knowledge or knowledge available to outsiders (Scott 1998). Language is, therefore, a passport to inclusion and legitimate participation. Such a conceptualisation lends weight to the argument that language is important not just for learning, but for finding one’s identity amongst other agents and structures, identifying hidden values or curricula and seeing how the use of language demonstrates the creation of different types of Metis.
Interpretative phenomenological analysis – meaning-making and identification of underlying social processes

Through asking critical questions of the text, researchers can consider what meaning the interviewee is creating (What do these experiences mean for this person?), and what significance that meaning holds (What might it mean for this person to have these concerns? What is their stance towards their experiences?) (Smith 1996). Smith, who developed the approach of interpretative phenomenological analysis (IPA), acknowledges that method adaptation is possible and sometimes necessary. This study deviates from his original conception in that we have applied the principles of interpretation to a much larger data set. It has been argued that IPA is more suitable for understanding personal experiences than social processes (Brocki & Wearden 2006). However, personal experiences and social processes are not easily separated but rather interlinked and inter-related to each other. IPA provides focuses attention on the nature (essence) of phenomena and what this means. These interpretations then formed the basis for further dialogue between our theoretical and empirical works as we sought to understand the meaning of perceiving oneself to be a ‘spare part’ from the students’ perspectives.

An IPA approach allowed development of the analysis to consider the implications of being an outsider – not being needed, and with nothing to offer. Students had an acute awareness of their indebtedness to others – conceptualising themselves as spare parts, and their need to learn as parasitic upon the real medical work taking place. This meant the students did not have a self-determined sense of legitimacy, but relied on others to provide it. Applying the theoretical perspective of Mêtis during the interpretative processes identified that from AEE there can be unintended and unpredicted consequences relating to identity and role (these are consequences that can be conceptualised as occurring in the ‘gap’ between theory and educational practice). The meaning-making which students might derive from these consequences includes a perception that the need to create bargaining tools to survive and achieve personal needs. Students also make choices despite their sense of powerlessness: reacting with either passivity or proactive engagement will have an effect on future experiences.

**Step 5:** Development of theory through dialogue with new empirical findings

As a result of Steps 1–4, and with the application of Mêtis to interpret the data a level of abstraction leading to the construction of a new mid-range theory (Merton 1936; Pawson et al. 2004) or what does (as opposed to what should) happen during AEE was achieved. Continually returning to the original data to ensure the arguments remained coherent with it was a key part of this step. It was possible to trace associations along a continuum from expectations, through dynamic interactions, to variable consequences in relation to AEE. Overall, the work demonstrates the need to conceptualise AEE as this continuum, subject to the influence of multiple variables. Individual student meaning-making and knowledge construction is dependent on how individual students experience the continuum. Papers discussing the detail of these findings are currently being prepared which focus on influences on social processes during AEE and the meaning-making and knowledge construction which are consequential to these processes (Yardley et al. in press; Yardley et al. in press).

**Discussion**

Taking a bi-directional approach, we developed understanding of how and why different outcomes arose from students participating in AEEs. This approach offers a mechanism for clarification of learning opportunities, without which evidence-based effective ways to maximise constructive learning cannot be developed. In our example it contributed to a richer understanding of the influence of social interactions in learning. It is possible that someone from another background or with a different conceptual orientation would have produced some differences in the findings. This possibility should be understood as a potential to enrich understanding further and develop the theory generated in this work, if someone were to undertake such analysis.

To produce verisimilitude, a logical systematic approach is more important than adherence to a particular set of methods (Kvale & Brinkman 2009). This article offers one methodological solution to understanding the gaps between theoretical and empirical works. Socio-cultural theories have much to offer medical education researchers if applied appropriately and critically. Without a more sophisticated understanding regarding the complexities of educational experiences and clarification of the wider contexts in which these are implemented, neither effective solutions nor potential problems can be addressed (Eva 2009, 2010; Regehr 2010).
Conclusion

A framework has been developed which theorises AEE as a complex experience in action. This framework allows both theoretical and empirical contributions to understanding of the social processes and dynamic interactions, between agents and structures, present within AEE. The principles of this approach now require application in other areas of medical education research to confirm or refine the use of multiple theoretical perspectives to achieve an interpretative analysis that remains embedded in the original data is a relatively innovative approach within Medical Education. Opting for multiple approaches to data analysis increases the trustworthiness of findings by providing inbuilt checks on interpretations through multiple perspectives, in addition to using data from different participant groups at sequential time points, and checking interpretations with student participants.

Intrinsic to the study design was a focus on what the students (and to a lesser extent, other participants) considered of significance. Evidently, this work has been conducted in a particular combination of place, time and circumstances. Using a study design such as we have described will inevitably produce results that cannot be assumed to be generalisable without attention to context. The use of both theoretical and empirical methods has allowed the generation of a mid-range theory of AEE as a continuum that now can be tested in other settings for transferability. This theoretical development has the potential to transcend the original empirical data generation. Nor does the successful use of Métis offer a generalisable solution to the ‘problems’ of clarification but we have demonstrated how the use of theory can contribute to a richer expression of understanding of social interactions within the field of Medical Education.

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Note

1. This system has since been updated several times. Researchers should seek local guidance on the current requirements in their locality.

References


