The consequences of authentic early experience for medical students: creation of métis
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CONTEXT Authentic early experience (AEE) describes experiences provided to new medical students to undertake ‘human contact’ to enhance learning. Although the concept of AEE is not new, and was commonplace prior to the Flexner Report of 1910, little is known about how or why meaning and knowledge are constructed through early student placements in medical, social and voluntary workplaces. Variance among settings means AEE is a collection of non-uniform, complex educational interventions which require students to make repeated transitions between different workplaces and their university institution. The purpose of this paper is to develop theory in this context.

METHODS We report on a study undertaken in a UK medical school using interviews and discussion groups to generate data from students, workplace supervisors and school faculty staff. We used narrative analysis to access knowledge and meaning construction, in combination with analytic tools drawn from thematic and interpretative approaches to phenomena. We sought to refine theoretical understanding through the application of métis, a socio-cultural theory novel to the field of medical education.

RESULTS Scott’s concept of métis provides a useful theoretical framework for understanding how AEE works for students in terms of their creation of meaning and how they choose to use it in relation to formally recognised knowledge. Knowledge and meaning, generated as a consequence of AEE, contained dichotomies and paradoxes. Students improvised, in the face of unpredictability and uncertainty, to create a form of métis that allowed them to handle the perceived competing demands of AEE settings and the medical school.

DISCUSSION We demonstrate how meaning making can be conceived of as student métis arising from social processes in students’ learning interactions. We suggest that the development of collaborative working with students could potenti ate positive forms of student métis, thereby maximising desirable educational consequences. Further work is required to establish effective ways to do this.
INTRODUCTION

Authentic early experience (AEE) has been defined as the experience provided by any intervention that requires new medical students to engage in ‘human contact in a social or clinical context that enhances learning of health, illness or disease and the role of the health professional’. Despite increasing use of AEE in response to policies such as those defined in the UK General Medical Council’s Tomorrow’s Doctors, and moves towards greater integration of medical curricula, surprisingly little is known about how medical students actually experience and make meaning from AEE. We sought to understand AEE from a socio-cultural perspective, initially drawing on both situated learning and activity theory as these have previously been applied to experience-based learning in medicine. We then refined our theoretical understanding of meaning and knowledge constructed through AEE using the concept of ‘métis’. This is a socio-cultural concept new to the field of medical education. It has potential to inform a coherent, holistic understanding of what happens in gaps between ideal and real practice with respect to both learning and workplace functions. It has previously been suggested that greater attention be paid to the bi-directional influences between students and workplaces. Here, we apply métis to findings from a qualitative study considering the consequences of these influences on AEE. The paper considers two research questions: (i) How and why do students construct useful knowledge and meaning making from AEE? (ii) How and why do students make AEE work for them?

Current perspectives on AEE

The concept of AEE is not new; it was commonplace prior to the Flexner Report. Unintended consequences of Flexner’s work included a reduction in student–patient interactions early in curricula, and a rise in student-perceived problems in applying theoretical scientific knowledge to authentic patients in the workplace in later years. It has been argued that the reintroduction of AEE in modern curricula provides a means to address problems associated with the transition into workplace-based learning. A detailed understanding of current practice related to AEE interventions can be gained from the work of Hopayian et al., Dornan et al. and Yardley et al. These authors review the intention of medical schools for AEE and known outcomes consequential to AEE interventions. Much of the existing literature is, however, of the summative approach to programme evaluation described by Regehr. Despite the origins of AEE in principles derived from pedagogies of experiential learning, the vast majority of empirical studies do not integrate or reference these or other theoretical principles. Explanations of how or why AEE has a positive effect on students’ ability to learn are, therefore, lacking. Most medical schools construct intended learning outcomes for AEE focused on personal and professional development objectives and the reinforcement of skills such as communication, rather than on content learning or knowledge. Whether AEE does, or should, contribute to new knowledge content is unclear. This is by direct contrast with medical education in later years, when students are expected to acquire knowledge of clinical sciences largely through workplace-based experiential learning. Overall, although some studies suggest that AEE produces useful learning, others show that students still struggle to apply knowledge in new situations.

Socio-cultural perspectives on experiential learning, including métis, suggest that learning, in the sense of knowledge and meaning creation, is dependent on the relationships among the learner, other agents and the environment. This insight provides a different perspective on the potential consequences of learning from experience, illustrated, for example, by Irby et al.’s recent suggestion that greater recognition is required of the formation of professional identities, alongside knowledge construction, through students’ making of meaning in medical education. During exposure to authentic workplace settings, students are then apprenticed in a way of thinking and can also learn content through collaborative activities.

Socio-cultural theories, such as situated learning and activity theory, have attracted particular interest in medical education. Activity theorists have tended to focus on transformation through practical action, whereas situated learning focuses on the social interaction between participants to negotiate change (Appendix S1, online). In medical education, however, these theories have been used mainly to justify what should happen, and what medical educators should aspire to in order to create ideal learning. The likelihood that a gap may occur between ideals and a holistic understanding of what does happen (whether intended or not) is recognised but not dealt with further. A key finding of our study was that the gap between pedagogical goals and what actually happens in practice in AEE is in itself significant and meaning-laden. This gap is not a void; instead it contains unpredicted and unintended
consequences. Purposive social actions, including educational interventions, produce such consequences because the actions of people or institutions always have unanticipated effects.\textsuperscript{22} Without a holistic view of the possible consequences of social interactions, there is potential for undetected paradoxical effects to defeat the intended purposes.\textsuperscript{3} This does not, however, mean that such consequences are necessarily undesirable, or that trends in consequences cannot be predicted through identifying recurring processes, interactions and influencing factors. It does mean that we need to theorise about what happens in theory–practice gaps. Métis is a concept which can be employed to consider these issues and was instrumental in our analysis to develop the findings (presented in Table 2 as a framework for consideration of all potential consequences) presented and discussed in this paper.

**Métis**

Scott originally defined métis as ‘…the kind of knowledge that can be acquired only by long practice at similar but rarely identical tasks, which requires constant adaption to changing circumstances.’\textsuperscript{3} He borrowed the word from its ancient Greek setting, in which it meant the intelligence or ‘know-how’ needed to achieve success in a given field. Scott did not, however, suggest that this knowledge necessarily represented mastery of a particular activity; rather, it describes the practical knowledge people use when interacting in circumstances defined by an institutional agency (such as a medical school or workplace) and, particularly, how such knowledge is used to adapt to change. Scott showed how the principles of métis apply in situations associated with perceived attempts at both benevolent and oppressive institutional control.\textsuperscript{3} ‘Practical’ knowledge encompasses both the necessary skills and ‘acquired intelligence’ to act according to one’s own purposes.\textsuperscript{3} Métis may or may not be the knowledge the institutional experience or policy was intended to produce, but it incorporates the ‘work-arounds’ needed to achieve the ends demanded by the institution or required to make life easier for the individual. In an educational context, métis can be conceptualised as the creation of meaning to ‘handle’ learning, as well as the individualised knowledge content generated through experience. The existence of métis, therefore, offers an explanation for how and why institutionally designed interventions can produce varied consequences when implemented in complex social circumstances. We will present the theory development which arose from our study through a métis-guided interpretation of our empirical findings.

**METHODS**

The study was situated within a UK medical school which incorporated AEE into the curriculum from Year 1. Table 1 shows examples from this study setting.

Authentic early experience was characterised as ‘placements’ within an ‘experiential learning’ strand that encouraged consideration of community and social dimensions of illness and health. Learning outcomes were set by the school and related to the title of each form of AEE as illustrated in Table 1. Students were mainly expected to be observers of authentic practice, albeit with some supervised interaction with patients and basic procedures. They were advised to keep records of their experiences in order to

<table>
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<tr>
<th>Year 1</th>
<th>Observation and interview experience with a health professional</th>
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<td></td>
<td>Interviewing a patient with a chronic illness</td>
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<td>Interviewing an elderly person and his or her carer about ageing</td>
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<td>Discussing health risks related to lifestyle</td>
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<td>Discussing modifying behaviour relating to lifestyle</td>
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<td>Conducting a mental health interview</td>
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<td>Year 2</td>
<td>‘Traditional’, occurring on hospital wards, in out-patient departments and other hospital departments</td>
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<td>Procedural-based: venepuncture, post mortem, coroner’s court (simulated case but authentic context and interaction with coroner)</td>
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<td>Community-based with allied health professionals and nurses</td>
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<td>Student-selected study in voluntary organisations</td>
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to develop portfolios (of professional development), as well as to complete written reflective assignments for submission.

A complete explanation of our methods with details of each step taken is available elsewhere. We summarise the key elements of our approach here. Semi-structured individual interviews and discussion groups (led by SY) were used to generate data from January 2009 until March 2010. Interviews were conducted in three phases; 23 students (Year 1: n = 11; Year 2: n = 12) were interviewed to identify knowledge construction and meaning making related to AEE. Workplace supervisors (n = 20) and medical school faculty staff responsible for AEE (n = 13) were interviewed to identify constructs of AEE and dynamic interactions between the groups. Student discussion groups included previous interviewees (n = 14) and new participants (n = 12). Recruitment occurred through face-to-face contact and e-mail via the medical school administrators. Ethical approval was received from the School of Medicine Ethics Committee and a National Health Service Local Research Ethics Committee. All participants gave written informed consent.

Students volunteered to participate. They had undertaken two to four placements in their current year of study; Year 2 students had completed up to six placements the previous year. Workplace supervisors were purposively selected to represent medical (hospital and community) and non-medical (social and voluntary) settings and according to the number of experiences they had participated in. Members of the school faculty with direct involvement in the design and implementation of AEE were purposively selected. All those identified agreed to participate.

Audio-recording with verbatim transcription was used. Concurrent analysis of the data facilitated iterative changes to the interview schedule. The interview schedule was designed to cover expectations, processes and consequences of AEE from the perspectives of each of the three participant groups. Participants were asked to provide examples of experiences and encouraged to explain their own interpretations of these. NVivo 8.0 (QSR International Pty Ltd, Doncaster, Vic, Australia) was used to facilitate the analysis, alongside hand-written notes. Emergent findings were shared with students during discussion groups (n = 26 divided into four groups by year of study and previous participation in an interview). These groups were designed to allow student participants to comment on emergent findings from all interviews and to enhance understanding of the student perspective through the discussion of views amongst peers with the aim of identifying areas of consensus or difference, and collective meaning making.

An iterative thematic framework, initially developed in vivo from the student interview data, was used to code other data. New codes were added when necessary. Narrative analysis, considering language content and structure, provided a methodological approach to access knowledge and meaning construction, in combination with tools drawn from interpretative phenomenological analysis. The process involved asking critical questions of the text, considering what meaning the interviewee was creating, and asking what significance that meaning held. CB and an additional contributor (RH) reviewed the coding strategy and analytic framework, incorporating multiple qualitative methods. In addition, CB undertook a more detailed coding check on two of the student interviews, which resulted in the consideration of only minor refinements. Meetings among CB, RH, JR and SY were used to discuss emerging interpretations.

The theory development, and content of student métis in this setting, shown in Table 2, arose from the integration of métis with our empirical findings. This theory offers a new way to consider all potential consequences that might arise from AEE, including those developed as a result of unavoidable gaps between the ideal educational environment and the pragmatic real-life environment of workplaces (Appendix S2).

RESULTS AND DISCUSSION

Two overarching themes emerged as unintended and unpredicted consequences of AEE. These are: (i) métis and the division between ‘real learning’ and authentic practice, and (ii) métis and professional identity in AEE. Table 2 categorises four possible types of knowledge or meaning consequential to AEE. These have been generated from our analysis and summarise the overarching finding that AEE produces both intended and unintended consequences, which, in turn, may be either predictable or unpredictable. The content of each category emerged from data as we used the concept of métis to bring coherence to our empirical findings.
Metis and the division between ‘real learning’ and authentic practice

Students constructed meaning based on a disjuncture between authentic practice, as witnessed during AEE, and the ‘real learning’ that they perceived to take place in and be recognised by the medical school:

‘…[AEE] weren’t linked to what we were studying… only supposed to be really linking to our communication skills not to what we were studying.’ (S3)

Often their meanings involved the rejection of some knowledge, rather than its assimilation and refinement into a more nuanced knowledge base:

‘The experiential learning is quite different because we are not supposed to know any medical knowledge about the diseases.’ (S4)

‘I just want to be qualified really so it’s just I need to do this to get through… some of the placements are just a bit annoying… like you could have been doing work in that time…’ (S5)

As a result, students did not see authenticity as a current priority in either gaining content knowledge or transferring knowledge for refinement through experience. Instead, students reported that AEE was about only interpersonal skills, which they conceptualised as separate from the medical knowledge that constituted ‘the medical course’ and was defined by medical school assessments.

Students focused on differences rather than similarities between simulated communication skills sessions within the school and interactions with authentic patients in AEE. Simulated patients (SPs) were conceptualised as agents of the medical school. This student expressed the common view that SPs were obeying the orders of the medical school:

‘I think simulated patients try to do things a lot more by the book, whereas real patients… you wouldn’t normally go through confidentiality with them and then consent… ‘cause they just… don’t see it as being important, whereas simulated patients will – that’s only probably because they’ve been told to… by the medical school.’ (S6)

The discrepancy in experience between interacting with SPs and authentic patients, respectively, made it possible for students to conclude that although knowledge of consent and confidentiality was important to the medical school, this did not mean that it was relevant in authentic settings. Alternative explanations such as that authentic patients might believe good practice in these areas to be a matter of routine

Table 2 Identifying potential consequences of authentic early experiences

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<tr>
<th>Predicted consequences</th>
<th>Unpredicted consequences</th>
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<tr>
<td>Intended consequences</td>
<td>Desirable but uncontrollable consequences (e.g. students meet positive role models and may develop specialty interests)</td>
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<td>Intended learning outcomes determined by faculty staff expectations of authentic early experience as a form of experiential pedagogy</td>
<td>The efforts of workplace supervisors to offer such opportunities were undermined as students created a dichotomy between authentic practice and real learning. Students had greater difficulty than predicted in making links for knowledge transfer. The resultant variety in meanings was unpredicted</td>
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<td>This study found potential for greater content learning (e.g. students understanding the impact multiple medications can have on a patient’s life after seeing someone with a chronic illness)</td>
<td>For example, students paradoxically derive meaning contrary to both the intention and prediction of curriculum designers, such as deliberately trying to set aside lay and personal perspectives in order to become ‘professional’</td>
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<td>These are relatively controllable consequences given appropriate planning and resources</td>
<td>‘Negative’ surprises if identified retrospectively from ‘unknowns’ have potential to be converted into positive learning through collaborative working</td>
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<td>Unintended consequences</td>
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<td>These are recognisable risks which caused faculty members concern (e.g. students meet negative role models, and potentially emulate their behaviour)</td>
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<td>The existence of student métis suggests that promoting explicit discussion of the differences between in-house and workplace practices would help students to make constructive use of ‘negative’ experiences</td>
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and therefore not to require discussion were not considered.

The students concluded that professionals and patients in workplaces did not recognise or identify with the demands placed on them by the medical school. These conclusions created a need for students to handle an apparent dichotomy between practice and medical school-derived learning. Their solution to this need is an example of métis: they handled the perceived conflict by constructing explanations that included beliefs that the school was out of touch with authentic practice, and concurrently sought to present to faculty staff what they perceived to be acceptable learning. This was exemplified in a common approach to reflective assignments for submission to the school following AEE. This student noted that these were easier to do once the student had worked out:

‘...what to expect – what they want us to write and things like that.’ (S7)

Other students reinforced this view, adding that they would not use any negative experiences in their reflections because they were concerned these might be interpreted as indicating a personal inability to cope and that any criticism of a workplace might have future repercussions. Another element in the students’ métis here is the ‘knowledge’ that the best way to ‘get on’ with the medical school is to deliberately present only what the student believes the school wants to hear and to suppress any acknowledgement of alternative experiences or understanding.

The dichotomy constructed between the two realities led to the devaluing of AEE as a source of content learning. Students, such as S5 above, described how AEE could prevent them from doing ‘work’ that would be formally recognised by the medical school. Overall, despite the faculty members’ intent that AEE would offer opportunities to remind students about why they were studying at medical school, the students perceived it as disconnected from learning medical knowledge. This student described her understanding of the place of pharmacology in AEE:

‘...with regards to pharmacology it doesn’t apply as much on placements... when you are talking about medication with patients they’ll just hand you a list of medications and... because I’m trying to focus on the patient, I don’t necessarily have the time to write down the list or really even pay very much attention to it, so I move on... Yes [laughs], they give me the list and then I look at it and go “Thank you” [laughs] and give it back to them.’ (S8)

This student’s attempt to apply the principle of patient-centredness (emphasised as necessary by the medical school) paradoxically resulted in her overlooking of something important to the patient and missing an opportunity to learn about medication use. Other students discussed developing skills to handle situations in which they were offered information that they did not perceive to be of current importance to them in the context of the course demands. These students were discussing how they acted when workplace supervisors attempted to share medical content knowledge that they thought was currently irrelevant:

‘You do almost park it [knowledge] at times and just kind of think “Right, this is something I need to know; it is important but it’s not relevant for the minute now”’ and you kind of just almost park it away knowing that you will come back to it later... you might even have notes on it that you’ve written that you just don’t look at them for the moment.’ (S7)

‘But how often do you park it and then never find the car again?’ (S14)

As the second student implied, AEE may have currently unrealised potential for content learning and for the development of better integration and transfer of knowledge. However, the students’ métis held that it was best for students to publicly pretend interest while privately ‘parking’ knowledge they did not perceive as immediately relevant.

A more positive form of métis was developed among students who adopted strategies that enabled them to meet challenges encountered in AEE, setting in motion a cycle of increasing confidence and willingness to attempt further challenges. For example, in the following excerpt, the student starts by acknowledging that an emotional patient presents a challenge to her, and that she has felt awkward and has not known how to respond. In the process of talking herself through the experience, however, she moves rapidly from a discourse of being ‘out of control’ to one of the experience ‘not being a big issue’, but, rather, a lesson in how to respond, and describes how her response produced the desired effect:

‘...on the second placement with the old lady – she became really emotional and... before I probably would have been like “Oh my God, what do I do?” ...I’ve had actually that hands-on practice now, I’d be
able to deal with it better in the future, I think, if I had an emotional patient in front of me who started to cry... and that's what... that's what I really will remember – how, like, how to react... I just remembered, you know, just give her a few minutes to compose herself and I didn't bombard her with any questions or anything and then afterwards I said, you know, just talked to her in a comforting manner etc. And that's how I dealt with it really, so it wasn't a big issue.’ (S1)

This student’s meaning making can be conceptualised as a positive form of métis; she had taken a risk and found that it 'worked' and was likely to reproduce this way of working in the future. However, not all students responded in this way and it may be the students who did not who should most interest educators. For many students, the survival of their current interaction is most pressing, not the potential to apply knowledge in the future. Survival may also be achieved by remaining passive when dealing with the unpredictable, which makes the student a ‘bystander’ in a potentially challenging or difficult situation. One student described a situation in which the doctor told a patient he would follow a particular management plan, but then apparently explained to the students after the patient had left that this was not his actual intention:

S2: ‘[T]he doctor basically just checked whether there’s any... infection and took, swabs or placebo swab and reassured the patient that everything will be fine... but, according to [the] doctor he comes in every few days... just because of this... wound.’

Interviewer: ‘Okay. And did the doctor tell you they were doing the swab as a placebo or was that something you thought?’

S2: ‘Later on. After the patient had went out. Because, the doctor – after taking [the] swab and reviewing the case or something – decided it’s a waste to send the swab off... for tests.’

Interviewer: ‘Okay. What did you think about that?’

S2: ‘[pauses] Well, I guess it’s a useful tool, in a way, but ethically I’m not quite sure.’

The student initially described this scenario using the term ‘placebo swab’. He then became ambivalent and distanced himself from the doctor’s actions. The meaning the student made was partly based on the doctor’s offering of access to a form of professional métis about interactions with patients. Instances of the sharing with students of workplace (professional) métis (whether these were controversial, as in the present case, or not) facilitated the integration of students into workplaces, moving them from outsider to insider status.

Table 2 shows that ‘real learning’ defined by the medical school was an intended and predicted consequence of AEE. Conceptually, however, it represented only one part of the knowledge construction and meaning making undertaken by the students. Authentic early experience also had desirable but uncontrollable consequences, such as the students’ difficulty in making links between what they perceived as necessary workplace knowledge and the demands of the medical school. In addition, it was neither intended nor predicted that students would interpret differences between communication skills training and practice in the ways that they did, such as with respect to their understanding of consent and confidentiality. The earlier example of the ‘placebo swab’ event illustrates a need for the medical school to discuss with students variance in practice if negative role modelling is to be converted into constructive learning rather than to remain as a form of métis pertaining to the hidden ‘professional’ culture.

**Méts and professional identity in AEE**

Students enter medical school with lay perspectives about the roles of doctors, which differ from how they perceive themselves. They want to show they are capable of developing into a doctor (and are seeking access to the métis they require to achieve this) while feeling closely aligned with patients during AEE. For example, this student, who had been sent to take a history from a patient in clinic unexpectedly, described the experience as one in which she and the patient shared a common sense of vulnerability:

‘I explained to the patient, that I’d got no experience at doing this... introduced myself and explained what I needed to do and would she be happy to talk to me... she was very supportive... she felt very vulnerable as well, obviously, because of the sensitive nature... of the reasons why she was there... I think she felt... quite comfortable with me and disclosed quite a lot...’ (S10)

The identity of ‘medical student’ was described by students as one that meant they were no longer able to take a lay perspective; however, they reported experiencing discomfort with their new professional role. Discomfort arose in the course of conducting
conversations that broke the boundaries of lay norms for everyday social interactions but in which the students perceived themselves as ‘spare parts’ without purposeful workplace functions. Comparing AEE with previous experiences of health care work, some students argued that their current status was actually a hindrance:

‘...if you’ve got a job on a ward, it’s entirely different... and you’re part of, you’re accepted but if you’re a medical student, you’re not.’ (S11)

Students felt required to accommodate others’ perceptions of what it meant to be a medical student although they did not yet feel legitimate in the role:

‘You will be professional and you will be polite and you will speak to people in a certain way and people will react to you in a certain way... whenever you mention you’re a medical student to anybody... you’re not a person anymore.’ (S12)

Initial experiences involved observing others at work or asking patients about their experiences of health care or illness, rather than making medical enquiries focused on seeking information to facilitate disease management. Students found it difficult in practice to discuss patients’ perceptions of, for example, lifestyle risks such as smoking or diet, and patients’ experiences of interactions with health care professionals regarding these topics:

‘You’re sort of asking all these lifestyle questions that really... you can ask them one or two, or maybe three, but you don’t want to go... you sort of feel it’s a bit intrusive almost, some of the detail you have to go into.’ (S13)

The students’ difficulty referred not to appreciating patients’ perspectives, but to understanding how to retain this appreciation whilst simultaneously developing a professional identity. They did not overtly display the cynicism and loss of caring attitudes reported to develop amongst students in later years of medical school. Nevertheless, they believed that, in order to become insiders, they needed to deliberately set aside lay perspectives and suppress personal views. This was despite the discomfort they experienced with the professional perspectives they felt it necessary to personally adopt. The paradoxical meanings discussed here were neither intended nor predicted consequences of AEE (Table 2). The métis which arose out of these tensions, rather than developing an under-

standing of ‘being professional’ that incorporated the use of judgement, referred to the development of a sense of a ‘homogeneous’ professional persona that required them to set aside the notion of ‘being a person’.

In addition, some students developed ‘chameleon identities’ to handle repeated transitions, thereby side-stepping any attempt to reconcile differences between the demands of their two sets of masters (the medical school and faculty staff, and workplaces and health care professionals) and to meet the requirements of each setting. Students discussed their expectation that the ‘tailoring’ of ideas for different interactions with different people in different settings was necessary:

‘I just suppose that you have to tailor it to whoever you’re speaking to.’ (S15)

Knowledge of these differences was developed into métis as students found that avoiding reconciliation ‘worked’ as a way to handle conflicting ideas. Students would choose when to declare learning in future interactions and how to present themselves according to their constructs of learning recognised by the school or their usefulness in workplaces. This held even when there were clear opportunities to make connections.

If, as our results suggest, the concept of métis can be applied to AEE, the student learning that goes unnoticed or is at least unattended to by placement providers and faculty staff will equate to the very practical knowledge with which students make choices about how to interact and present their learning. Student métis encompasses all that the students made use of to ‘handle’ AEE to make it ‘work’ for them. In this context ‘work’ describes the outcome of students’ negotiation of their experiences in ways they deem useful for serving current goals. Knowledge incorporated within student métis guides how and why individual students choose to interact with others (in the medical school and in the authentic workplaces in which their AEE is situated) to suit their immediate needs and purposes, as well as educational goals. An extreme interpretation reveals a paradox whereby AEE results in consequences that are opposite to those intended by educationalists in terms of how students themselves experience the intervention: they do not see themselves as legitimate participants, however peripheral, within the workplace, which fundamentally differentiates their educational experience from that envisaged by Lave and Wenger. Our students did not experience place-
mements as part of integrated learning within the curriculum because they were unable to resolve for themselves the different and often contradictory knowledge presented to them by medical school faculty staff and placement providers.

CONCLUSIONS

Application of these findings to practice

The formation of different types of métis is something that educators should expect and seek to work into their own local context in an effort to improve educational value. It is not intrinsically constructive or destructive, positive or negative. Used positively, the development of métis may facilitate desirable learning and professional development. By contrast, used negatively, it may facilitate an attitude of cynicism and a tendency to ‘play the game’.

Both our theoretical development and empirical data support the idea that unintended consequences are part of the complex picture of knowledge and meaning making that arises from AEE. The key question for educationalists – both researchers and practitioners – to emerge from our findings concerns how we might identify all potential consequences of interventions such as AEE. The content of student métis is not necessarily fixed. Scott describes the problem of paradoxical consequences resulting from the best intentions. His work suggests that these are most likely when an institution or an agent considers the subjects of an intervention to automatically benefit from an imposed structure without adequate collaboration with these subjects. Table 2 may form the basis of a tool for consideration throughout the process of design, implementation and evaluation of AEE or any other social educational intervention in order to ensure that a social and holistic view of its potential consequences is obtained. With the exception of unintended or unpredicted consequences, the different potential consequences should be discussed and explicitly considered prospectively during the process, as well as retrospectively.

Experience is necessary but, in isolation, not sufficient to create useful, functional and transferable meaning. To achieve such learning, support comparable with that identified by Dornan et al. as a requirement in later years is likely to be necessary. This study suggests that the need ‘to belong’ can conflict with the desire to develop a unique personality as a student takes his or her ideas of ideal medical practice into AEE workplaces. These tensions make unpredictable the consequential knowledge and meaning making that result from experiences. Student métis provides a conceptual thread which links these research findings into a coherent explanation of how AEE works for students through social interactions. The space between the ‘practice of school’ and the ‘practice of medicine’ may be impossible to bridge while students are unable or unwilling to claim legitimacy in both. The nature of AEE results in a lack of boundary crossing by anyone other than students, who, therefore, have no model to follow. An element of student métis refers to student perceptions that they are better off as ‘chameleons’ than as ‘bridges’, a paradoxical unintended consequence that allows them to ‘handle’ their situation and to maintain an identity of their own.

Strengths and limitations of the study

Regehr suggests that a shift towards an ‘imperative of understanding’ and an ‘imperative of representing complexity’ might generate rich understandings of ‘the complex environments in which our collective problems are uniquely embedded’. He is critical of research that fails to address why an educational intervention does or does not work, and also of research that starts by seeking empirical data to support a pre-selected theory. In our study, we attempted to avoid these pitfalls. We began by undertaking a critical analysis of socio-cultural theories already in use within medical education and concluded that although these theories offer valuable aspirational goals, they do not enable a theoretical understanding of how, in practice, students construct knowledge and meaning to make AEE work for them. We undertook empirical work to explore these questions and, as our findings emerged, demonstrating dichotomies and paradoxes, we sought to develop our interpretations through a novel application of the concept of métis. This has brought coherence to our findings that the social nature of AEE can lead to unintended and unpredicted consequences. In undertaking this work, we have refined theoretical understanding of how students handle the knowledge and meaning they construct through socio-cultural processes, including that which is an unintended consequence of their interactions. This illuminates further what does, rather than what should, happen.

The use of multiple methods, multiple groups of participants, multiple phases of data generation and concurrent analysis, and efforts to facilitate further student discussion of emergent findings and to allow
empirical and theoretical findings to challenge one another, increase the credibility of these findings. Nonetheless, this work has necessarily been conducted in a context that involves a particular combination of place, time and circumstance. This study was conducted in a UK medical school and thus it is possible that elements of the findings relate to this particular school, or country (although these findings have resonance with those of previous studies conducted elsewhere). We do not claim that the same content of dichotomies or paradoxes will necessarily be found in other settings. Neither does the identification of metis offer a generalisable solution to the ‘problems’ of AEE. Instead, it contributes to a richer expression of understanding of the meaning and knowledge construction created by students from their experiences.

**Further research**

For the students within this study, the processes of meaning making and knowledge construction, within their personal and collective metis, hold potential to influence their future interactions. Meanings made now shape future experiences as students either build further upon them, or refine or reject them. What matters is less that these are early experiences and more that they represent the first of the workplace transitions medical students are required to make. Different students will make different choices regarding the extent to which they opt to replicate existing culture or seek to influence and change it. The reconceptualisation of knowledge as student metis offers a theoretical basis that avoids the framing of one form of knowledge in opposition to another. Further research is needed to understand how knowledge and meaning generated through social interactions are developed and used within other areas of medical education. This has the potential to inform innovation in health care practices and holds educational benefits for future doctors.

**Contributors:** SY originally conceived this research study and led the development of its design and implementation at all stages, including the conceptualisation of a framework to integrate theoretical and empirical elements of the work. She carried out data acquisition, analysis and interpretation. She first identified and applied the theory of metis within a doctoral thesis on which this paper is based. SY created the first draft of this paper. CB was instrumental in refining the research methodology of the study and made a substantial contribution to the analysis and interpretation of data. JR critically reviewed the study design and made a substantial contribution to the analysis and interpretation of data. CB and JR supervised SY’s doctoral thesis. All authors provided intellectual content, contributed to the critical revision of the paper and approved the final manuscript for publication.

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**REFERENCES**


**SUPPORTING INFORMATION**

Additional supporting information may be found in the online version of this article. Available at: http://online library.wiley.com/doi/10.1111/j.1365-2923.2012.04287.x/suppinfo

**Appendix S1.** Choice of theoretical perspective.

**Appendix S2.** A method workflow

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