USING CONCEPTS OF (IM)MATERIALITY AND SUBJECTIVITY TO EXPLORE DIGITAL LITERACIES AND THE ‘21ST CENTURY LEARNER’

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**Abstract**

This paper sets out to explore the relationship between digital literacies and the student subject as ‘21st century learner’. It emerged from part of a doctoral research project which aimed at tracing a figure of ‘the 21st century learner’ into a school. Data for this project was gathered by the ethnographic methods of participant observation, artefact collection and informal interviews (Forsey, 2010; Gordon, Holland & Lahema, 2001; Roehl, 2012). Early in the analysis, ‘digital literacy’ emerged as a key theme. To explore this theme of ‘digital literacy’ in relation to the ‘21st century learner’ as a student subject, a model was required that allowed for the conceptualisation of the material and immaterial elements of digital literacy practices as conditions in which individuals were taking up subject positions. This led to the theoretical framework proposed by Burnett, Merchant, Pahl and Rowsell (2014) in which the ‘(im)materaility’ of literacy is conceptualised as an assemblage of ‘space, embodiment, stuff and mediation’. This framework allows for an exploration of the way that, in this case, digital literacies are implicated in the formation of student subjects, within the classroom and breakout spaces, and with the objects of digital technology and texts. It allows the paper to go beyond a discussion of students as users of digital technologies to a consideration of individual subjectivities; of how individuals were forming themselves in conditions of physical and virtual space, and with the available materials and texts. Thus, this paper aims at bringing together Foucault’s concept of ‘technologies of the self’ with a consideration of digital literacy as an (im)material practice, with the aim of better understanding individual ways of being digitally literate.

**Introduction**

Digital literacies are powerfully constitutive of who we are and who we can be as social and knowing subjects. This is why it is essential that teachers have the opportunity to understand how individual students become digitally literate. In this paper, a model of (im)materiality is adopted to analyse how four students engage with digital literacies in a contemporary middle school setting. This model was developed by Burnett, Merchant, Pahl and Rowsell (2014) to understand the complexity of digital literacy as a socio-material practice. This model brings together concepts of ‘space, mediation, embodiment and stuff’ to examine how digital literacies constitute student subjects. It allows for analysis of the diverse and individual ways that students form and perform a range of subjective learner positions, and provides a framework by which we may understand more about the ways that students become digitally literate.

This paper begins with a brief overview of current thinking about digital literacy as a socio-material practice. This is followed by a discussion of the concept of (im)materiality as developed by Burnett et al (2014) and how it was applied to analyse the data. The methods of data collection are outlined with a brief overview of the research process and ethical considerations pertinent to this type of research. This is followed by a vignette of the four students engaged in a research based task and a sample of slides produced several weeks later by the group for presentation. The episode contained in the vignette is analysed with four concepts of (im)materaility – space, mediation, embodiment and stuff. Conclusions are drawn regarding individual student’s experiences of digital literacy and some of the implications for teachers are explored.

**Digital Literacies**
The field of research in digital literacies encompasses a wide range of situations, practices and spaces in which people engage with online and offline digital media, programs and tools. Being digitally literate means being able to use digital tools for many purposes – for example, to make meaning with texts, communicate with others, carry out daily lives and perform identities (Jones and Hafner, 2012). Digital literacies are practiced with technological tools. These include laptops, smartphones, tablets, keyboards, screens, wi-fi connections, applications and websites. Digital literacies are also closely interwoven with who we are and can be as individual and social beings (Adams and Pente, 2011). In this paper, digital literacy is therefore positioned as a socio-cultural, but also socio-material, practice (Lankshear and Knobel, 2010).

In this paper, not all aspects of digital literacy are considered. However, an aspect of digital literacy that is especially salient here is the way that information is accessed, selected, collated and re-used in digital forms and with connected devices (Lankhsear, 2011; Erstad, 2010). The emergence of digital media and its associations with multimodal text production/consumption has created opportunities for information to be easily accessed and re-used for new purposes (Kress, 2009). These include the practices associated with digital media production – such as making video, taking and using photography, and engaging in ‘remix’ where ‘people combine or rework existing artefacts into something new’ (Sheridan and Rowsell, 2010; Adams and Pente, 2011).

(Im)materiality

(Im)materiality is a term used by Burnett et al (2014) to express a relationship between the material and immaterial as ‘reflexive and recursive’. Their model of (im)materiality seeks to explicate relationships between space, mediation, embodiment and stuff, and thereby explore literacy as a socio-material practice. This model refers to the material presences of such things as screens, wires, walls, keyboards, tables, texts, whiteboards, bodies, but shows these as dynamically intertwined with the discursive, social, affective and conceptual aspects of literacy experience and practices.

![Figure 1 Conceptualizing (im)materiality – reproduced from Burnett et al (2014)](image)

Each of the aspects of (im)materiality represented in the model above has been based on a range of theories in the field of literacy and these are comprehensively described by Burnett and her colleagues. The four conceptual categories in this model have been applied in this analysis in the following ways.
Concepts of *space* as physical and virtual, as well as social, are used in this analysis to ask; where are these students in relation to the school and outside of school spaces; where do they go and what do they do there? How is space regulated and managed by these students and their teachers? What literacies are involved in searching and navigating in spaces? Concepts of *mediation* are used to ask; how are texts used by students in the digital medium? What is being mediated by these texts? How do individual students create digital texts and for what purposes? Concepts of *embodiment* are employed in this analysis to ask; how do individuals manipulate digital tools to achieve their purposes? Why and in what way do they move between physical and virtual spaces? The concept of *stuff* is used to ask how are these young people making meaning with objects? What are the effects of laptop screens and of non-digital materials in the way students are performing themselves as learners?

As the analysis progressed, it became evident that each of these four concepts were interrelated and at times difficult to separate – for example student movement around the table to share a text on a laptop screen is a spatial and embodied activity, but also contingent on the physical aspects of the laptop and ways that these students are relating to a text and to each other. However, this is why this model was chosen as a way of exploring the complexity in which every literacy event is enacted.

**The site**

The site in which the data that underlies this paper was gathered was a Middle/Senior school in South Australia. The school was at that time well-resourced with good quality wi-fi and one to one laptops. Recently a new building had been completed which was characterised by large open spaces, moveable doors and comfortable furniture. In this project, I visited the year 7 classes once a week for a period of ten weeks in 2014 and then ten weeks in 2015 (with a different cohort of year 7 students but with the same teachers). The students and teachers were participating in a trial of Challenge Based Learning (Apple Incorporated, 2011) which is pedagogically similar to problem based learning and rooted in inquiry and constructivist approaches to learning but presented as ‘new’, partly because of the tie in with digital technologies. In this case the challenge was to create a presentation about a group devised solution to an identified water issue. Typical water issues identified by the students were water shortage/supply, water degradation, and flooding.

This research was undertaken as part of my doctoral studies. I was at that time working part time at the school as a teacher and undertaking my research in the school. As I was working in the same school in which I was conducting research, there were some ethical considerations that had to be addressed before starting the data collection and during analysis. Once I had informed the Principal of my research aims he gave permission to invite teachers to participate. The year 7 students involved in the project were informed through an information sheet which I spoke to in class groups. Parents were also informed and permission was documented in a consent form. During the observation phase of the data collection my role in this site as researcher was layered with my role as teacher. The students (such as the four students represented in the following vignette) were familiar with me as a teacher and my presence was not unusual. However, and perhaps because of these layered roles, my presence in their space was not neutral, and the following observations and subsequent analysis is imbued with my subjectivity, as a teacher and a researcher interested in digital learning and individual difference (Brockmann, 2011).

**Methods**

During the ten weeks (in both 2014 and 2015) I collected a range of materials that had been created or ‘remixed’ in their implementation of the Challenge. These materials included examples of presentations created by the students. I observed what people were doing in the weekly CBL session – and this was recorded in my notes, and in diagrams and photographs. In this paper, I look at two examples of digital literacy events that were enacted in this site. The first example is a vignette taken from one of the mornings where four students (Ellen, Natasha, Alex and Rory - pseudonyms) were investigating the possibility of making a bucket into a transportable water filter. The second example is taken from this group’s multimodal presentation – which included a power point presentation, narration and demonstration with a model of the water filter.
Space, mediation, embodiment and stuff: articulating the material and immaterial in two literacy events

The remainder of this paper focuses on a vignette of a single literacy event which was noted during the broader study of Challenge Based Learning in this school. Four power point slides are also provided in order to give some indication of how this model may also be applied to student production of text. The broader study investigated relationships between the material and immaterial in depth, across 20 weeks over two years. However, for the purposes of this paper, this one example is chosen to illustrate this particular way of understanding digital literacy and of understanding diverse and individual ways of being digitally literate. In the larger study, an actor network theory approach (Latour, 2005) was applied to trace the enactment of effects of networks of material and immaterial entities. This paper is consistent with the approach taken in the larger study, but is more focussed on the evidence that this vignette provides in relation to digital literacy as an assemblage of material and immaterial elements, and of the inclusion of individual students in these assemblages.

Vignette: Water filter

In the water project, students worked in groups to find solutions to a water issue. This group has moved out into the ‘break out space’ to work on their solution. They had decided on a water filter in a bucket. In the scenario below, each of the four students in the group (Ellen, Natasha, Alex and Rory) are sitting at an oval table in the breakout area. They each have their laptop open in front of them and are for most of the time oriented towards their own or each others’ screens as they move around the table. At the beginning of this vignette Natasha has found something on the Bunnings site. She explains how that would work and be applied to their solution. They are looking at an image of a bucket.

Ellen says: “We’ve actually got a bucket. It’s about this big…” Ellen explains about a bucket that she has at home that they could use. Meanwhile, Alex is looking up other bucket options. He tells the others about it – it is also on the Bunnings site. The girls come around to his side of the table and look at it. Alex reads out the details/info about that bucket.

I ask Alex what food grade means. Alex looks it up – Googles it – and finds that food grade means grading food. So Ellen looks it up – Googles it – and finds that food grade plastic is plastic that doesn’t leach the material into the water.

The next time I look at what Alex is doing he is searching up Kim Jong-un because they had looked up water bottles (that are safe to use) and found the Kim Jong-un water bottle…..

For me the boys appeared to be off track – signified to me by their laughing. Natasha tries to get Rory back on track. I sit back and observe what Alex does next. He appears to be moving across sites quite laterally – the topics I note are – plastic water bottle bans – Apple innovation – what we did in Primary School – bookmarks I have – deleting bookmarks which are no longer needed.

Across the table, Natasha is watching a video on membrane filtration. She found it by Google search ‘how does a membrane filter work’ and found a video. After 2 mins of watching it she decides it isn’t useful. So she goes to a website. “That’s interesting” says Natasha to herself and makes some notes.
Water Challenge Presentation – the slides

The group were selected to present their solution to the year 7 cohort and a panel of judges at the culmination of the project. They produced a power point (4 of the 21 slides are reproduced here) which was narrated by each in turn and accompanied with a demonstration using the model of a water filter that Natasha had made.

Figure 2 Power point slides produced by Natasha, Ellen, Rory and Alex

Navigations and ‘breaking out’: moving out of the classroom in virtual and physical spaces

Adopting the model described above (Burnett et al 2014), concepts of space as material (a physical or virtual space) and immaterial (designed, produced, manipulated, evaluated, governed, negotiated) are adopted in this analysis to ask where are these students in relation to the school and outside of school spaces; where do they go and what do they do there? What literacies emerge in searching and navigating in these spaces? How do these literacies construct individuals as learners and students?

These students are connected to each other and the world beyond school in subjective ways. The laptop computers, wi-fi, internet browser (Google) and websites combine with the inquiry questions (e.g. how to make a transportable water filter) to place these students in touch with happenings in places close to and far away from these students’ physical location. The students move around the physical space – moving out of the classroom into the breakout space and moving around the table to share screens and then back to their own chair. They move around in virtual spaces – Bunnings (an Australian hardware store), Zazzle (a design start-up based in California), You Tube and a personal documents folder. They choose to go to places that have originated physically far away but easy to visit in a virtual space and find what they need. This has the effect of making the ‘global’ part of the local, and connected to many other local sites (Latour, 2005) – as is shown by Alex’s movement from Bunnings to Zazzle to My Documents. There are connections being made between Bunnings (probably originating interstate), Zazzle (originating in California), the You Tube video about water filtration (originating in the US), Ellen’s home (“we’ve actually got a bucket…”) and the inquiry questions. These connections are made in the (im)material practices of digital literacy – linking navigation through virtual spaces with connections across time and space to create students who are globally connected through the expansion of their local networks.

In this vignette the students are described as moving, searching, going to a website and getting back on track. These spatial metaphors signify the spatiality of literacy - realised through movement into and
around the ‘break out space’. Literacy as a spatial practice is also evident in the ways that students are searching the web by moving across or going to websites. Navigating the web can be conceptualised as a spatialized literacy (Burnett, 2011) which, like all literacy practices, is both discursive and constitutive. Navigation is spatialized because it takes students into a range of virtual spaces in which social relationships and individual identities are constituted in relation to those spaces. In this vignette, students were navigating in virtual spaces as well as moving in and out of the online/offline environment for a range of purposes (Burnett et al, 2014).

This analysis of the navigation practices evident in the vignette has a focus on Alex’s and Ellen’s navigation around the topic of ‘food grade’. Both Ellen and Alex are orienting in digital networks but in different ways. Alex starts with a search for ‘food grade’ and moves from site to site in a loose thread of connected meanings to a page about Kim Jong-un water bottles. Alex’s navigation is laterally connected and while it is not focussed specifically on the group product (a water filter), this navigation works to build knowledge around the context, where Alex is engaged in personally meaningful navigation of the web, and sharing his experiences (Rory is participating in this with him). He also learns what is meant by food grade plastic. Ellen takes a more direct route to find out how the definition of food grade applies to the group project. She quickly finds an answer to her question about food grade plastic. As a learner, Alex moves into a series of divergent spaces, moving across a range of websites which are seemingly irrelevant but at the same time informative. He negotiates a relationship with the inquiry question/topic but at the same time creates himself as playful, divergent; interested, but not invested. Ellen takes up a different position as an efficient knowledge worker, as she efficiently navigates the web for a definition of food grade plastic – a navigation that encompasses her prior knowledge of the purpose for which she is researching (i.e. to identify what food grade plastic is in relation to the water bucket solution that the group is devising) and attention to the end goal.

Each of these spaces into which these students move are imbued with social meaning and provide a context for certain literacy practices (Comber and Mills, 2015). These students moved out of the classroom into the adjacent ‘breakout space’; they also moved out into commercial retail environments and out into virtual spaces that could teach them about scientific principles (water filtration) or to other virtual spaces that were not especially relevant to the project (Zazzle) but still informative. This is a learning space where knowledge is sourced from the web, and applied by the students themselves to solve a problem and design a solution, and often away from the teacher’s gaze. It is a self-directed activity where students are positioned as independent inquirers and where knowledge can be sourced from places in the ‘real world’, as well as from more traditional education sites. Thus, Alex, Rory, Natasha and Ellen are positioned by their access to the break out space and to the many places they can visit on the web, as independent and self-directed learners. However, in their individual orientations to searching and navigation, these four students enact independence and self-directedness in diverse ways.

Mediated connections: using and producing texts for individual and collective purposes

The second conceptual category included in Burnett et al’s (2014) model is text, or more precisely the way that digital texts mediate meanings about the world. The guiding questions for analysis were: how are digital texts used by students? What is being mediated by these texts? How do individual students create digital texts and for what purposes?

Digital texts are material resources - they exist on the screen, and their materiality is multimodal, often interactive, sometimes ephemeral and easily captured for ‘remix’ purposes. The laptop screens allowed easy access for Alex, Rory, Ellen and Natasha to look around, look up and look around web based media texts. In these activities, each of the four students can be seen making individual and subjective choices, and often sharing those decisions with others in the group for various purposes. In the context of the group, with its project goal (create a water filter), students were evaluating, selecting and rejecting texts as they moved through these sites. However, their criteria for evaluation was diverse.
Natasha was discerning in her viewing of the You Tube film about how a membrane filter works, when after 2 minutes she decides it was not useful. This showed Natasha judging, not so much the trustworthiness or reliability of the information but, significantly, the relationship of the information to other information, to her own goals and interests and to the contexts in which it was to be used (Facer, 2011). Searching in this way is a digital literacy practice that is closely connected to prior knowledge and the purposes for which the searching is happening. As discussed above, Ellen and Alex had their own individual ways of finding out about food grade plastic. The purpose of the search, what is being searched, where is it searched from, and how meanings are made with the information, are all variables in the search process. Understanding the complexity of searching through digital texts helps to explain why the individuals, in this vignette, carried out their searching in subjective ways. There are many parts to a seemingly simple search where individual choices, prior knowledge and purposes articulate the way it is done.

Burnett et al (2014) propose that 'screen based texts mediate reality in ways that prompt shifting relationships between the material and immaterial' (page 95). In this vignette, commercial sites such as the Bunnings and Zazzle website become pedagogical, teaching these students about, for example, types of plastic but also about ways of buying and selling online. The You Tube video teaches Natasha about the materials used in an industry based water filter, as well as the structure and features of expository text in this filmic mode (the video was persuasive as well as explanatory). Natasha showed discernment in her viewing of the You Tube clips, and the knowledge that she gained from the second video was based on scientific principles that had been applied in a water treatment plant somewhere in the US. Thus, she is learning how a membrane filter works to clean water and also how it is applied in an urban context to supply clean water to people. Natasha is able to interact with these videos – to reject one as unhelpful and to take information from another as it suits her purpose. She may never view this particular video again (there are 39,000 video hits for her search phrase) and in this sense the text is ephemeral, but the science that she is basing her filter design on is based on established and empirically based scientific knowledge. For Sarah, the activity of finding and viewing this You Tube video is an (im)material literacy practice where the diagrams and narration in the film interweave with her purposes, her interest in established scientific knowledge and her desire to do this task well.

The materiality of digital text affords remix possibilities where segments of text can be copied and moved elsewhere, put together with other text, or modified (Sheridan and Rowsell, 2010). These actions require skills in using the keyboard and/or mouse and knowledge of the rules of the program/application in order to carry out a type of material curatorship (Potter, 2012). Curatorship here refers to the practice of pulling images, diagrams, words or other forms of text from a webpage and moving them around and thus remixing or recreating them into a new text. In the broader study of which this vignette is a part, there were many examples of this type of curatorial working with texts to create a new text. In this group’s presentation, however, the materials they put together for particular meaning making purposes were ‘original’ in the sense that they had been designed and created by individuals in the group. The students in this vignette have applied data gained from the web to create pie charts and diagrams that communicate their purposes – to provide justification for the water filter as a solution and to provide explanation of how it would work and who it would benefit. They have applied the information gained from their searches, viewing and reading of websites and videos to create a model of a water filter which they photographed and loaded onto the slides as images. In these ways, we can see how the immaterial aspects are intertwined with the material production of new texts in a digital literacy practice of that puts together information into visual, three dimensional and linguistic modes. This process involves selection, discernment and transfer of information into knowledge – it curates knowledge into specific solutions and forms of media where it can be communicated and shared with others. In these practices with information and knowledge, these students are being positioned as efficient knowledge workers whose skills with digitally presented information are signalled as success.

Looking toward the text allows us to think about the tools of media production as well as the way that this media packages and communicates knowledge for distribution and consumption (Sheridan and Rowsell, 2010). One of the students, Rory, has, in other school based tasks, been excluded from
participating as he finds written text challenging. The multimodality of the power point presentation provides an opportunity for Rory to create a detailed diagram of the water filter, and so in this presentation, at least part of his repertoire of textual practices are being recognized and built upon. This is a significant aspect of Rory’s relationship with himself and with others as he forms his learner identity (Burnett and Merchant, 2015).

**Embodied digital literacies as (im)material: felt experience and movement**

The concept of embodiment provides another perspective by which digital literacy can be analysed as an (im)material practice. Many meanings are embodied in the materiality of the texts being read and produced in this vignette, but meanings are also being made the interactions of bodies with texts, devices, spaces, and people. In the model adopted in this paper, embodied meaning making emerges in the subjective felt experiences that students have with text. In this section I broaden the model to include the lines of movement by which relationships are embodied and articulated.

Alex’s learning strategy is quite playful and unstructured as he moves around his memories, features of the browser, information he finds interesting and concepts in the project. He narrates verbally as he moves through these events and Rory joins in with laughter. We can see how the relationships that Alex has with the texts he is navigating, reading, viewing, sharing are connected to the momentary (and perhaps more enduring) relationship that he has with Rory. In the embodied (im)materiality of this event Rory and Alex share laughter, friendship and a sense of belonging – and at the same time reject, in this moment, the position of good student that Ellen and Natasha perform so well. Looking closely at Alex’s interactions in this vignette, including his interactions with texts and other people, we can see the significance of the immaterial - felt associations, prior experience and emotion - in the way he is interacting with texts (Burnett, 2015). These immaterial aspects are deeply implicated with the meanings that he is making. There is humour and laughter and memories from primary school. There is also a mixture of purposes – the finding of information, the performance of self, the enactment of relationships, the desire to be amusing (and amused). In the materiality of digital text there is also the sensory experience such as movement of fingers over the keyboard, the colours and shapes on the screen, and the swift movement of pages on the screen.

In this vignette the students are described as oriented towards their own and others’ laptop screens. They are seated around an oval table, which positions them across from each other and facing each other. These orientations in physical and virtual spaces are productive of each student’s movements. In this school, each child has a personal laptop. Each laptop screen moves around the space with each individual and connects them to each other, to sources and to places inside and outside of the school. As Comber and Mills observe, ‘readers of the internet follow diverse hypertextual pathways or rhizomes often generating unpredictable ‘lines of flight’ in our reading…’ (2015, p 96). As these students move around in virtual spaces they create their own lines of movement, which pause at particular sites, divide off into new sites and at times return back. Looking closely at these lines of movement shows how Alex is oriented to the task by exploring through internet sites in a loose and tangential way, following what interests him and sharing with Rory, while Ellen is oriented to the task by using concise search terms, finding specific information and applying it to the product. Natasha is oriented to the task by determining what she can find out about the materials used in a membrane filter to make a filter that works based on scientific knowledge. Thus we see how individual purposes, interests, prior experiences and subjective positioning of self in relation to the task (and perhaps also to ‘school’) are all implicated in the way that each student practices digital literacy.
The meaning of stuff

The term ‘stuff’ in this model of (im)materiality draws on the concept of artefactual literacy; a concept framed by Pahl and Rowsell to explore ‘how meaning is made from all kinds of “stuff” in all kinds of ways’ (2011, p151). Artefacts show how connections are made between the activities in the classroom (or break out area) and other realms of life experience. They show how knowledge is being applied and how meaning is being made. The students in this vignette are making meaning with the real-life objects with which they interact. These real-life objects have specific values, as do the practices with which they are associated.

The materiality of stuff is self-evident but a consideration of how objects intertwine with thoughts and are constituted in discourses shows how the stuff with which these students are networked, are implicated in their subjectivities. In the vignette described above there is a lot of stuff with which these students interact, as they engage in this approach to learning. Their research is about buckets; filtration materials; types of plastic; water; impurities in water; and the chemical composition of water. It is carried out with laptops, keyboards, while sitting in chairs at a table; notes are taken in an exercise book with a pen. The research in which they are engaged, is about things and how they can be put together to solve a problem. The information gained about filtration materials and the nature of water is later applied to create a filter design and model of a filter. These observations of the physical and chemical properties of things reveal learning as a material practice where knowledge of things and their qualities are applied to solve a problem and make a solution. Each of these students, gather information with their personal computers and they can be seen to make their own meanings through the way that they enter search terms; follow up interests; select sites and pages to read/view; share what they have found and take out what they need. In short they can be seen to be constructing knowledge and making meaning through their inquiry into materials and the material properties of things or stuff.

As stuff or ‘things’, the digital texts accessed and created by these students are ensembles of semiotic resources, composed of modes, put together with keyboard/mouse and screen, and moved around for various purposes. But they are also ‘things’ where knowledge is being circulated and valorised. The information that is carried in digital media texts is a type of material, “from which individuals fashion the knowledge they need” (Kress, 2009, page 25). For example, Natasha accesses information about membrane filtration and integrates this with information about the place where the water problem exists. As she applies this information to create a model water filter with her material resources - pot, sand, gravel – so she transforms that information into knowledge (Jones and Hafner, 2012). Her experiences with the stuff of this activity link materials together with thought, knowledge and the production of a solution. Thus we see how Natasha performs herself as creative problem solver with the artefacts in her on and offline worlds.

Space, text, embodiment and stuff: implications for teachers in the early 21st century

The concept of (im)materiality brings physical/virtual spaces, text and human actions together with social spaces, mediated realities and human thought. This ‘bringing together’ happens in the moment of interaction in which the material and immaterial are assembled as literacy practices. It is in the (im)material activities of inquiring, navigating, searching, looking, finding, reading, viewing, discerning, copying, remixing, sharing and designing that students are performing themselves as certain types of learners.

The students in this vignette can be seen as 21st century learners - independent, self-directed, globally connected learners, adept with digital media, and as productive workers who apply information to solve problems and design solutions. Positioning students as 21st century learners in this way, establishes them ‘as possible, desirable and even indispensable objects of knowledge’ and as inevitable in this time and place (Rabinow, 1994). It combines the way that each student interacts with
themselves and with technologies as a mechanism by which they become a certain kind of person – perhaps tied up in cybernetic or cyborgian metaphors (Adams and Pente, 2011; Loveless and Williamson, 2013). However, as we have seen, each of these students are a knowing subject, who interacts with the (im)material aspects of space, text, stuff in subjective ways.

Humans have always made and used tools and in this iteration of being a student, the 21st-century learner is closely connected with digital tools and their affordances. The digital literacies by which these students carry out their individual and collective inquiry, act as “technologies of the self” – mechanisms by which individuals create and perform themselves as subjectively intertwined with spaces, texts and the stuff of school. By exploring the practices of digital literacy acted out by the four individual students in this vignette and presentation artefact, we can see how their experiences arise from singular forms of thought, as they form themselves moment by moment (Foucault, 1986).

While student engagement with digital media and directing their own learning can be noted to some extent in the vignette, the concept of (im)materiality allows insight into the way that individuals in this case are creating and performing subjective positions in the physical, virtual and social space of the school and with the digital tools of mediation. Alex, Natasha, Rory and Ellen can be seen to be making their own individual way of being learners in the 21st century, and it is precisely this diversity and difference in orientation, experience, purpose and interaction with text that a model of the (im)materiality of literacy can help us to understand. For teachers working to develop capabilities in digital literacies, this way of analyzing individual ways of being digitally literate in the context of school, is both helpful and important. Adopting this model, as I have done in this paper, allows teachers to look beyond digital literacy as a mental construct or set of skills and to understand it as a network of (im)materiality. But also, it allows us to understand and work with diverse approaches and individual difference in our educational spaces.

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