Turning back the page on digital literacy: The role of traditional literacy in shaping digital practices

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Abstract

The precise definition of digital literacy has long been contested. Although early definitions recognised the importance of traditional literacy (the ability to read and write) for engaging in digital practices (Gilster, 1997), this connection is often overlooked in recent scholarship, policy initiatives, and digital literacy frameworks. This article draws on ethnographic data from two secondary schools in England to present a case that highlights the relationship between traditional and digital literacies, underscoring the importance of acknowledging and better understanding their interplay. Situated within a socio-technical approach and complemented by Rosenblatt's transactional theory of reading (1978, 1986, 1995) to conceptualise technology-as-text and user-as-reader, the article presents analysis of three classroom vignettes to illustrate how students' interactions with an "adaptive" EdTech platform intended to support literacy learning are shaped by their traditional literacy skills. Our analysis identifies a series of transactional breakdowns between reader and text, each marking a moment in which no meaningful transaction can occur due to insufficient consideration of how traditional and digital literacies intersect. Framing EdTech as a straightforward solution to literacy challenges without attending to the nuanced and context-specific ways students engage with such technologies ultimately risks reinforcing the very disparities they seek to address.

Keywords: digital literacy, literacy, digital, EdTech, schools, ethnography, socio-technical

Introduction

The precise definition of digital literacy has been a subject of enduring debate. Throughout the 1990s, various authors used the term "digital literacy" to refer primarily to the ability to read and understand information presented in emerging hypertext or multimedia formats (Bawden, 2001). The term gained particular prominence in 1997 when Paul Gilster, in his book titled *Digital Literacy*, defined the concept as "the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers" (p. 1). Accordingly, Gilster's definition can be interpreted "simply as literacy in the digital age (…) the current form of the traditional idea of literacy *per* se—the ability to read, write and otherwise deal with information using the technologies and formats of the time" (Bawden 2008, p. 18). However, while Gilster's definition offered a useful starting point at the end of the twentieth-century, digital texts and digital practices have become, and are becoming, more complex (Pangrazio et al. 2020, p. 443).

As a result, digital literacy has come to be conceptualised in myriad different ways, intersecting with other literacies scholarship including multiliteracies (The New London Group, 1996), new literacies (e.g., Knobel & Lankshear, 2007) media literacy (e.g., Bennett et al., 2020; Buckingham, 2003; Jenkins, 2009; Livingstone, 2004), information literacy (e.g., Sample, 2020; Zurowski, 1974), and, more recently, data literacy (e.g., Acker et al., 2024), AI literacy (e.g., OECD, 2025) and platform literacy (Livingstone et al., 2025). While digital literacy can be broadly conceptualised as a set of capabilities and skills that enable individuals to fully participate in digitally-mediated societies (Pangrazio & Sefton-Green, 2021), the proliferation of "literacies" underscores the growing complexity and multifaceted nature of what it means to be digitally literate in today's rapidly-evolving technological society.

As education becomes even more globalised, there is an increasing policy emphasis on standardising and clearly defining digital and digitally-related literacies, including the

development of frameworks that specify the measurable knowledge, skills, and competencies deemed necessary for digital participation. For example, the Essential Digital Skills framework (DfE, 2018) in the United Kingdom, the OECD's (2025) AI Literacy Framework, and initiatives such as the European Commission's Digital Competence Framework (Vuorikari et al., 2022) all provide tools for mapping digital competencies across contexts including education, employment, and civic life. However, apart from an OECD (2021) PISA report that focuses on how 15-year-olds in 70 OECD countries develop reading skills to navigate the digital world, it is notable that many of these frameworks fail to consider how traditional literacy intersects with or relates to digital practices. In this respect, many mainstream efforts to define digital literacy have arguably diverged too sharply from Gilster's conceptualisation. Moreover, the growing emphasis on evolving technologies such as AI has, at times, overshadowed the continued relevance of traditional literacies and the ways in which they intersect with digital practices.

Although the notion of a universal conceptualisation of digital literacy is problematic due to the heterogeneity of educational, technological, and political contexts (Pangrazio et al., 2020), it remains crucial to acknowledge the enduring significance of traditional literacy within frameworks and initiatives. This is even more important in light of the accelerating development and deployment of generative AI. As generative AI becomes increasingly embedded in everyday life, individuals are not only expected to navigate digital platforms, but to interact with them in linguistically sophisticated ways (McKnight, 2021; Picton & Clark, 2024). This is particularly evident in the use of AI tools that rely on prompt-based interactions, where outcomes are significantly shaped by users' ability to articulate clear, purposeful, and contextually appropriate instructions (Good Things Foundation, 2024b; Knoth et al., 2024).

Equity implications

Failure to recognise the interrelatedness of digital literacy and traditional literacy risks obscuring the cumulative and relational nature of literacy development, and may inadvertently reinforce educational inequities by failing to address the pre-existing literacy practices that young people bring with them into digital spaces. Indeed, despite persisting rhetoric characterising young people as tech-savvy "digital natives" (Prensky, 2001), research shows there are significant gaps in young people's digital literacies (Author, 2020; Good Things Foundation, 2024a; Haddon et al., 2020; Livingstone et al., 2023; Nominet, 2023; ONS, 2019; Pangrazio, 2018a). While evidence shows that adults with lower levels of literacy find it difficult to engage with the digital world (Digital Poverty Alliance, 2022; Ofcom, 2022), there is little research examining this connection, and even less that focuses specifically on young people.

This article presents an exemplary case that illuminates the relationship between digital literacies and traditional literacies. In response to declining literacy levels observed among children and young people in the United Kingdom (Bonafede et al., 2025; Clark et al., 2025; Pisa, 2022), educational technologies (EdTech) have become central to national policy initiatives; increasingly supported and promoted as a means to alleviate low literacy levels in schools (DfE, 2019; 2022). Drawing on ethnographic data from two secondary schools in England that employ Syntaxa,[1] an "adaptive" EdTech platform widely used to support students' literacy learning, we examine how traditional literacy influences students' digital practices. Underpinned by Rosenblatt's transactional theory of reading (1978, 1986, 1995), which posits that meaning is co-constructed through the dynamic interaction between reader and text, we conceptualise the technology-as-text and user-as-reader in our analysis of three classroom vignettes. While we do not aim to fully theorise or disentangle the complexities of

[1] Syntaxa is a pseudonym for the EdTech platform referenced throughout this article.

the interplay between traditional and digital literacies – such work requires further empirical investigation – our findings indicate that traditional literacy does play a significant role in shaping students' digital engagements. Therefore, framing EdTech as a straightforward solution to literacy challenges without critically examining how existing literacy disparities may influence students' engagement with these technologies risks perpetuating and even exacerbating educational inequities.

The interplay between traditional and digital literacies

Scholarship examining the interplay between traditional and digital literacies is limited. Several studies have examined the link between reading skills such as comprehension and fluency, and the ability to comprehend and evaluate online sources (e.g., Forzani, 2018; Kanniainen et al., 2019; Kiili et al., 2018; Kim Thao et al., 2024; Macedo-Rouet et al., 2020), and there is a body of scholarship examining the relationship in the opposite direction; that is, how engagement with digital tools may influence traditional literacy practices. For example, research on digital or screen-based reading indicates that the former tends to promote skimming, word-spotting, and surface-level navigation through use of hyperlinks, brief textual segments, and visual layout cues at the expense of sustained, inferential reading (e.g., Jensen et al., 2024). However, such studies tend to employ experimental methods comprised of surveys and assessments, and therefore fail to account for the nuanced, contextual factors shaping participants' practices. In particular, they overlook the complex ways technologies are entangled with the social dimensions of their use.

A socio-technical lens facilitates a comprehensive exploration of these entanglements by integrating both social and technical dimensions. Within this domain, Science and Technology Studies (STS), Actor–Network Theory (ANT), and broader sociocultural approaches have been particularly influential in advancing understandings of digital literacy. Such perspectives enable a holistic view of individuals' digital engagements by considering

technologies' affordances, limitations, aesthetics, and embedded values alongside the social and educational practices that shape their use, as well as the broader political and commercial contexts in which they are situated. For instance, drawing on ANT to foreground the social practices associated with technologies, alongside their material considerations, Ibrar Bhatt (2012) illustrates how mobilising personal digital literacy practices in classroom activities enables learners to effectively connect their everyday digital skills with the demands of their academic work. Similarly, Luci Pangrazio (2018b) employs a sociocultural approach to elucidate the complex social and technical factors that shape young people's digital engagements, thereby offering a nuanced mapping of their digital literacy experiences. Yet, overall, the relationship between traditional literacy and digital literacy remains under-theorised, and there has been insufficient dialogue between literary studies and critical studies of education and technology to understand the interplay between them.

Conceptualising technology-as-text and user-as-reader

Situated within a broader socio-technical framework, our analysis draws on literary theory; specifically, Rosenblatt's transactional theory of reading, to explore the interplay between students' digital and traditional literacies while engaging with Syntaxa. Rosenblatt's theory provides a valuable complement to the socio-technical approach that characterises much work on digital literacy in critical studies of education and technology, enriching the analysis by foregrounding the user's active role and unique positionality – "each reader brings to the text a different set of past experiences, a different personality, mood, and purpose" (Rosenblatt 1978, p.14). This theoretical framing provides a lens to closely examine the subtle dynamics of individual students' interactions with the technology. Together, these perspectives illuminate how students' digital engagements with Syntaxa are shaped not only by the design and function of the technology, but also by the nuanced, situated relationships

between themselves, the technology, and the broader context in which the interactions take place.

Rosenblatt's theorisation of reading as transaction keeps "both reader and text in focus" (Rosenblatt 1985, p. 103), emphasising the reader's active role in constructing meaning when engaging with the text: the "physical text is simply marks on paper until a reader transacts with them" (Rosenblatt 1986, p. 123). Rather than the text being an object upon which information, knowledge and meanings can be extracted or discovered, the reader is understood to play a significant role in the meaning-making process. Evoking the imagery of a spiral, Rosenblatt (1995) depicts the act of reading as an ongoing, cyclical and iterative process: "The relation between reader and signs on the page proceeds in a to-and-fro spiral, in which each is continually being affected by what the other has contributed" (p. 26). To the reader, the text brings an arrangement of signs and symbols to be engaged with; to the text, the reader brings their own set of experiences and knowledges. Just as a printed text has its own grammar and syntax, technologies have their own systems of signs, symbols, and conventions. Students' engagements with EdTech can thus be conceptualised as a transactional process in which meaning emerges through the dynamic interplay between the user (reader) and the technology (text) itself.

Consistent with a socio-technical perspective, Rosenblatt's theory also emphasises the centrality of context: "Context takes on scope and importance from the transactional view of the reading event as a unique coming-together of a particular personality and a particular text at a particular time and place under particular circumstances" (Rosenblatt 1985, p. 104). The reading event should be seen "in its total matrix", including not only "what the reader brings to the transaction from past experience with life and language, but also the socially molded circumstances and purpose of the reading" (Rosenblatt 1985, p. 104). Conceptualising the technology-as-text and user-as-reader therefore requires consideration of the particular

circumstances of the school, such as its pedagogic culture and digital infrastructure, the particularities of the text/technology, and the particularities of the reader/user, including their past experiences, motivations, and levels of traditional and digital literacy.

An important dimension of the reader's context is how they approach the texts; specifically, their motivation or "stance" (Rosenblatt, 1978). Rosenblatt theorises that readers typically approach a text with either a predominantly "efferent" stance or a more "aesthetic" stance. These two stances do not operate as a dichotomous pair, but as opposite ends of a continuum. Readers are likely to adopt a more efferent stance when their purpose is the retrieval of information – the reader tends to focus on the end product, "concepts to be retained, ideas to be tested, actions to be performed after the reading" (Rosenblatt 1978, p. 24). When adopting a more aesthetic stance, readers connect to the associations, feelings, attitudes, and ideas that the words and their referents seem to evoke within them (Rosenblatt 1978, p. 25). A reader's stance significantly shapes the meaning-making process and may shift throughout the reading transaction. While readers exercise agency in determining their position along the efferent–aesthetic continuum, this positioning is also influenced by external factors such as the nature of the text, its aesthetic features, the reader's expectations, and instructional guidance from educators.

Methods

The study was guided by the following research questions: 1) how does traditional literacy shape students' digital practices when engaging with an "adaptive" EdTech tool designed to support literacy learning?; and 2) what role does "adaptive" EdTech play in mediating the relationship between traditional and digital literacies? The data presented is derived from two ethnographic cases undertaken as part of a broader research project ('Name') that employs six in-depth ethnographies to explore the relationships between equity, technology, and

teaching and learning in secondary schools in England. EdTech is increasingly seen as an important way to address educational and social inequities in English schools, with its implementation actively promoted through government policy (e.g., DfE, 2019; 2022). In each of the ethnographic cases, the researcher spent ten to fourteen weeks in the school community and used a multi-method approach to explore how technology is embedded in everyday school practices. This included workshops with students, semi-structured interviews with teachers, students, and parents/carers, some of which incorporated walkthroughs (Light et al., 2018) of different EdTech platforms, and observations of students engaging with EdTech across various settings such as mainstream and intervention classes, internal exclusion rooms, and homework clubs. As outlined below, this article draws on a particular subset of the data to examine how students' engagements with Syntaxa – an EdTech intervention intended to support the students' literacy learning – are informed by and mediated through the interaction between their traditional and digital literacy practices.[2] This research was approved by, and received ethics clearance through the (Name)'s Central University Research Ethics Committee (EDUC_C1A_2223_037). All data collected from participants was conducted with informed consent.

Research sites

Both schools – Draymoor Academy and Milborough High[3] – were non-selective and part of different MATs (multi-academy trusts).[4] At both schools, the proportions of students with EAL (English as an additional language) and SEND (special educational needs and disability), and those eligible for free school meals, exceeded national averages (HM

[2] The combined dataset for the two schools is comprised of 28 teacher interviews (including members of the senior leadership teams), 43 student interviews, 18 parent/carer interviews, 5 workshops, and 122 classroom observations.
[3] The school names along with participant names are pseudonyms to protect the privacy and confidentiality of the institutions and individuals involved.
[4] Academies receive funding directly from the government and have more control over how they do things than community schools, which are maintained by the local authority (HM Government, 2025a).

Government, 2025b). Both schools served diverse student populations, though Milborough High's catchment area was beginning to shift following the opening of another school within the same MAT nearby. With students from more diverse backgrounds being more inclined to attend the newer school due to its proximity, Milborough High was beginning to draw more local students with less diverse backgrounds, typically coming from wealthier families.

Located in an urban area in the North West of England, Milborough had approximately 1,500 enrolled students. The school performed well academically, with an above-average percentage of students achieving grade 5 or higher in maths and English GCSEs (HM Government, 2025b).[5] Compared to Draymoor Academy, the school had a slightly higher level of technological resourcing and granted greater agency to both teachers and students in how they used technology. While the school did not have the capacity to support individual device use during lessons, there was roughly one computer room available per curriculum area, which teachers could book for specific lessons. Adaptive EdTech – products that claim to "personalise" learning resources according to student ability and progress – were used for homework and targeted intervention sessions. At the time of data collection, the school had recently started using Syntaxa for the first time with a cohort of approximately 10 Year 9 students (aged 13 to 14) who had been identified as requiring supplementary literacy support. Instead of attending their mainstream lesson, these students gathered in a computer room to use Syntaxa once a week. It was planned that students demonstrating satisfactory progress, as indicated by the Syntaxa data, were to be replaced with other students who were also expected to benefit from the intervention.

Situated in a different and more deprived urban area of North West England, Draymoor Academy was part of a larger MAT. There were around 1,300 students registered

[5] GCSEs are typically taken by students aged 15–16 at the end of compulsory secondary education in England. A Grade 4 represents a standard pass, broadly equivalent to a 'C' grade on the old grade scale (Ofqual, 2018).

and, unlike at Milborough High, the proportion of students attaining grade 5 or above in GCSE maths and English was below national average (HM Government, 2025b). Technology use was driven by a top-down approach from the MAT-level, with teachers and students afforded limited autonomy in their use of technologies. In classrooms, teachers routinely used visualisers to present instructions and information, to model step-by-step approaches to answering questions and solving problems, and to provide feedback on student work. Outside the classroom, adaptive EdTech products were used for homework and to support a small number of students with specific needs in intervention classes. Draymoor Academy had invested in Syntaxa several years earlier, but this was the first time the intervention class teacher had used it. He had been instructed to incorporate it into his Friday morning lessons with his class of 10 Year 8 English students (ages 12–13), whom he affectionately referred to as "the most important in the school (…) they cannot read, they cannot write, they cannot tell the time, they cannot point out England on a map of the British Isles". These lessons were scheduled to take place in a computer room but, due to infrastructural and resourcing challenges, often took place in the library which was not adequately equipped to accommodate all 10 students.

Syntaxa

Syntaxa is an adaptive educational technology aimed at secondary school students who are not meeting age-related expectations in literacy. Using rule-based algorithms to tailor students' learning pathways, it targets three key strands: vocabulary, grammar, and comprehension. Students are assigned to one of 180 profiles based on their performance during an initial 30-minute assessment, with the level continually adjusting in response to their ongoing performance. Students are required to engage with various literacy tasks including phonics-based word games, grammar correction activities, and comprehension exercises. Syntaxa can thus be conceptualised as a multimodal text that brings together

diverse formats that include written prose, short-answer questions, and a range of visual texts such as photographs, animations and instructional videos. Students can view their performance data through their individual accounts, and teachers have access to more detailed data via the teacher dashboard, which provides data pertaining to student progress, skill mastery, and time on task. The dashboard also highlights students who may need additional support and suggests targeted offline intervention lessons when necessary. For best results, the company recommends students use Syntaxa three to five times per week in combination with high-quality teaching.

Syntaxa observations

The vignettes presented in this article are drawn from observation schedules developed by the research team and completed by the researcher during the literacy intervention classes (two observations at Milborough High and four observations at Draymoor Academy).[6] Questions and prompts centred on how students and teachers interacted with the EdTech, as well as the role the EdTech appeared to play in shaping relationships among students and between students and the teacher.[7] While seated among the students, the researcher remained a passive observer during the one-hour lessons. At times, they engaged in ad-hoc conversations with students and teachers to ask about their perspectives and experiences of using Syntaxa, several of whom took part in follow-up interviews after the observations. In some instances, analysis of the vignettes is supported by additional data from the broader dataset, including interviews and other classroom observations. In these intervention classes, the proportion of male students exceeded that of female students, consistent with existing research highlighting boys' comparatively lower levels of traditional literacy in England (Ofsted, 2024). The focus on male students in the

[6] The vignettes have been edited slightly for readability and coherence while preserving the original meaning and sequence of events.
[7] Although the vignettes are based on this observational data, they represent themes arising from analysis of the two ethnographies.

three vignettes was therefore not a deliberate choice, but rather a reflection of the gender composition of the classes.

Data analysis

The data was managed using NVivo software and analysed inductively using reflexive thematic analysis (Braun & Clarke, 2021). Following an initial phase of data familiarisation and coding, the researcher proceeded to generate, develop, refine and define themes (Braun & Clarke, 2021). Subsequently, a second level of analysis was applied to the vignettes, informed by Rosenblatt's transactional theory of reading. Positioned within a broader socio-technical perspective, this approach enabled synthesis of diverse meanings and patterns across the wider dataset while enabling a more granular exploration of students' interactions with the EdTech platform. Importantly, this approach provided a comprehensive framework for capturing the complexity of students' engagements with Syntaxa, highlighting the dynamic and interdependent relationship between the user (reader) and the technology (text), the interplay between the students' traditional and digital literacies, and the wider contextual factors shaping their engagements.

Findings and discussion

Analysis of the vignettes reveals a series of transactional breakdowns between the reader (student) and the text (Syntaxa). Each breakdown marks a moment in which no genuine transaction can occur due to the insufficiently considered interplay between students' traditional and digital literacies. Specifically, these breakdowns reveal four key ways in which traditional literacy shaped students' digital practices, thereby constraining the nature of their "transactions" with the technology: 1) students' limited ability to decode the visual and linguistic symbols necessary to initiate meaningful engagement with Syntaxa; 2) misalignments between the meanings students constructed (their comprehension) and the responses expected by the EdTech; 3) students' own perceptions of weakness in their

traditional literacy skills; and 4) insufficient support for students' linguistic and experiential resources within the reading environment.

Vignette 1: Liam (Milborough High)

Liam is visibly frustrated that he continues to get a set of questions wrong. There is a disconnect between what he thinks the question is asking him and what it is actually asking him. As a result, he thinks Syntaxa is broken – "Miss, I think Syntaxa's broken (…) I'm not that stupid!" (…) Amir tells him, "Just skip it", but Liam persists with asking the teacher. She asks to listen to the questions herself, but they have already passed. She tells him to log off and then log back in again, and returns around five minutes later. She tries to explain what the question is asking him to do, but he doesn't seem to fully grasp the concept. Unclear how/whether this is resolved. Later in the lesson Liam is presented with a series of questions focusing on syllable stress. When he answers incorrectly, he notes the correct answers (generated by Syntaxa) on paper so that when the questions are repeated he can refer back to the answers and input them correctly.

- One week later -

Liam tries really hard throughout the entire lesson. He uses Google to search terms he is unsure of, e.g. 'preposition' and 'verb', and applies this knowledge to the questions. He gets the answers correct and he looks proud/pleased with himself. He then answers one incorrectly and loses his streak. He bangs his fist on the desk. This happens a few times and is hard to watch – he's clearly upset/frustrated. The teacher calls from her desk, "keep going, you're doing well". Emphasis is on perseverance, not pedagogy…

The reading transaction "designates an ongoing process in which the elements or parts are seen as aspects or phases of a total situation" (Rosenblatt 1985, p. 98). In other words, readers do not approach texts in a vacuum – transactions are shaped by various "elements" or

"aspects". Liam's engagement with Syntaxa was, at least in part, mediated by feelings of stigma. Through various conversations and observations, it became clear that being able to write legibly and to read and comprehend with confidence was important to Liam. On one occasion, he explained he had been offered a laptop to support his dyslexia-related learning needs during lessons, but was concerned about how this might affect his handwriting and spelling: "you could maybe lose the ability to have good handwriting and learn how to spell words better" [Liam, interview]. As a result, Liam chose to stop using the laptop after a couple of weeks, a decision that was also influenced by his experience of stigmatisation: "You're going to stand out (…) people would like turn my computer off as a joke. Yeah, or delete my work sometimes" [Liam, interview]. Liam also expressed concerns around stigmatisation in relation to the Syntaxa intervention class; specifically, that others might view his participation as a way of avoiding mainstream lessons: "some people might think of if you're going to have computers to do, say like Syntaxa, they think oh, I'm just getting out of lesson (…) to go and play on computers instead of actually learning new stuff" [Liam interview]. Liam's transactions with Syntaxa were therefore shaped, in part, by these "past experiences" (Rosenblatt, 1978) of stigmatisation and his personal motivation to improve his literacy.

In the Syntaxa intervention classes, Liam applied himself diligently and became frustrated when the system indicated he had answered questions incorrectly. In the vignette, his initial frustration stemmed from a misalignment between his interpretation of the task and Syntaxa's instructions. Syntaxa presupposed a level of traditional literacy (in this case, linguistic comprehension) that Liam did not yet possess, thereby limiting his ability to answer correctly. Aside from calling into question Syntaxa's capacity to effectively "personalise" its instruction to Liam's literacy level – despite its claims to do so through embedded assessments and ongoing performance tracking – this moment underscores Syntaxa's inability

to account for Liam's identity and the broader context of the transaction. As described above, Liam was motivated to improve his literacy but indicated that he sometimes felt embarrassed about being removed from his geography lesson to attend the intervention class. Syntaxa's immediate feedback, which repeatedly informed him had answered incorrectly, appeared to reinforce his sense of inadequacy and marginalisation. He concluded that Syntaxa must be broken and told the teacher, "I'm not *that* stupid!", his emphasis on the word "that" suggesting he already believed he must be "stupid" to be placed in the intervention class.

Liam's experience reflects a transactional breakdown characterised by a misalignment between the textual demands and the reader's particular context. According to Rosenblatt, "literary works remain … merely inkspots on paper until a reader transforms them into a set of meaningful symbols" (Rosenblatt 1995, p. 24). Although Liam translated the "inkspots" into a set of symbols, the meaning he constructed (his comprehension) did not align with the response expected by Syntaxa. In this instance, the anticipated reader-text transaction failed to materialise because Syntaxa's design did not adequately accommodate the reader's needs. This misalignment led to confusion and frustration, which may have negatively impacted Liam's academic self-concept and self-esteem.

This experience appeared to prompt Liam to develop strategies for circumventing the system. Expressing a desire to access different questions, he later employed a workaround to complete a set of tasks on syllable stress. Rather than developing an understanding of syllable stress, he wrote down the correct answers (generated by Syntaxa after answering incorrectly), and reused them when the questions reappeared. As he explained during a follow-up interview:

> … because it was trying to find which syllable had an accent on it, like which one you'd say louder but when I try it, I'd get it wrong or right, it was just like a matter of guessing at the end and I had to try and figure out like more or less the algorithm. I

> would go two on the right would be right and then two on the left and then there'd be three on the right that would be right, so it took me about two weeks to get past one level. [Liam, interview]

This moment highlights Liam's ability to navigate the digital platform with ingenuity and imagination, while simultaneously revealing the failure of the EdTech to foster genuine literacy development. Syntaxa interpreted Liam's repeated correct responses as evidence of learning, though no genuine transaction had occurred between himself and the text.

Surface-level engagement of this kind was common during the intervention classes at Milborough High. As noted in the vignette, the emphasis seemed to be "on perseverance, not pedagogy", with students encouraged to meet the performance metrics promoted by Syntaxa and reinforced by the teacher and wider school environment. Printed texts often contain values reflecting the beliefs, assumptions, priorities, and cultural norms of the authors who wrote them or the society in which they were produced. Similarly, educational technologies have values encoded in their design. One of the most prominent values embedded in Syntaxa is consistency, with the platform's data visualisations emphasising the importance of "streaks" – the ability to correctly answer as many questions as possible in a row. Students' streaks are depicted by a shield icon in the corner of their interface, which is continuously updated to reflect their number of consecutive correct answers. Students are rewarded with a streak shield once they have completed five units, and can track their streaks for the three areas (comprehension, grammar, and vocabulary) from their personal dashboard. This data point, among others, serves as a yardstick for evaluating students' literacy development and competence.

The teacher rarely engaged with students unless they explicitly sought help, instead offering sporadic platitudes from her desk such as, "keep going, you're doing well!", and repeatedly referring to the streak data in an attempt to increase engagement:

> The teacher tells me: "They seem to be motivated by the streaks so I've just run with that". At the beginning of the lesson she says, "I told the other class last week about your streaks and they absolutely smashed you!". A student responds, "What did they get?". "Like, in the 130s", the teacher replies. "No pressure – but they are beating you!" [Classroom observation notes, Year 9 Syntaxa].

The platform's emphasis on consistency was closely intertwined with another dominant value: competitiveness. Visual progress metrics encouraged students to compete not only with themselves as they aimed to surpass their own previous performance, but also with their peers. These practices, facilitated and encouraged by the teacher, reinforced a normalised culture of competition within the intervention class, a dynamic particularly pronounced at Milborough High where a subtle but persistent undercurrent of competitiveness accompanied the school's otherwise convivial atmosphere. The emphasis on consistent performance, combined with the prevailing competitive ethos, arguably encouraged surface-level engagements with Syntaxa (such as Liam's strategy for answering the syllable questions correctly) at the expense of fostering meaningful transactions with the literacy tasks.

Vignette 2: Raheem (Draymoor Academy)

Raheem, who finds the work challenging – he cannot read most of the content (questions or multiple-choice answers) and there is not always an option to listen to the text being read aloud – avoids doing the work by looking at the performance screens (Figure 1). He does not know what any of this information means and asks me for clarity. At one point, when he is attempting to do the work, Syntaxa tells him: "You've powered up! You're moving up three levels!". He asks, "what does this mean?".

Figure 1 – Syntaxa performance reporting

At Draymoor Academy, Syntaxa was used by the Year 8 English class identified as having the lowest literacy levels in the year group. Raheem was one of four students in Year 8 who also received small-group English language support once a week from the school's EAL teacher. This support comprised three lessons per month delivered with minimal use of technology, alongside one lesson in which students used a different adaptive EdTech product to support their literacy learning. In contrast to Syntaxa, this EdTech product offered multilingual translation which allowed students to access and engage with the content in their first language. Observations of Raheem using both platforms indicated that this feature significantly supported his experience:

> The students seem very engaged throughout the whole lesson. All four students are in the Year 8 English class I have been observing on Syntaxa. Two of the students seem more engaged on this platform than on Syntaxa, and my hunch is that this is because the work is more accessible/easier for them. [Classroom observation notes, Year 8 EAL]

As illustrated in the vignette, Raheem found it difficult to access the material displayed on the interface: “he cannot read most of the content”. Unlike the transactional breakdown described in the first vignette – which was due to a misalignment between Liam’s constructed meaning and the response expected by Syntaxa – here, the transactional breakdown occurred due to Raheem’s limited ability to decode the visual and linguistic symbols required to initiate a transaction with the text. As Rosenblatt (1978) states, for a meaningful transaction to take place a reader “must possess competence in the phonemic and syntactic systems of the language, as well as the system of visual symbols” (p. 55). The content presented by Syntaxa did not align with Raheem’s level of proficiency in the “systems of the language”. During an earlier observation, the teacher noted that using Syntaxa was “deeply dispiriting” for Raheem as even the lowest Syntaxa level was too difficult for him. Highlighting one example, he pointed to a question containing the word “exposition” and remarked, “That’s ridiculously hard for him!”

The Syntaxa intervention classes at Draymoor Academy were beset by resourcing and infrastructural issues. The first 15 minutes of one class were spent rummaging around different classrooms searching for the English department’s single box of headphones. When that proved unsuccessful, the teacher eventually found some in a storage room tucked away in the back of the building. Given the misalignment between Raheem’s literacy level and the content presented by Syntaxa, he relied heavily on audio support to access and engage with the material. While Syntaxa occasionally offered a read-aloud option, its availability was inconsistent, leaving Raheem without the necessary scaffolding to support his learning. In response, he avoided engaging with the learning tasks and instead navigated to the performance dashboard, where he spent time looking at data displays he did not understand. He explicitly asked for help interpreting this information, indicating that it was not intuitively meaningful or pedagogically useful for him.

At another point, a notification appeared providing feedback: “You’ve powered up! You’re moving up three levels!” Again, Raheem asked for support decoding the text (“what does this mean?”), suggesting a disconnect between the motivational language of the EdTech interface and his actual understanding of what was being measured or achieved. Unable to decode the instructional content or the feedback, Raheem became disengaged from the learning process. Rather than supporting his literacy learning, Syntaxa presented affirmations that created an illusion of success, which did not reflect his actual engagement with the text. Raheem’s level of traditional literacy thus shaped – and constrained – his digital participation, highlighting a troubling paradox: unable to access the learning content itself, Raheem turned to other parts of the platform (such as the performance reporting pages) which were similarly text-dependent and inaccessible, illustrating how EdTech products designed to support literacy development may inadvertently exclude the very students they are intended to help when they fail to account for the interdependent nature of traditional and digital literacies.

This exclusion is further compounded by the fact that such technologies do not account for students’ lived realities, and the social and material conditions in which they are used. As previously noted, infrastructural issues and limited resources routinely disrupted the Syntaxa intervention classes at Draymoor Academy. On one occasion, the computer room the lesson was scheduled to take place in was already occupied by students taking mock exams, and the other computer rooms were being used by the PE department, which was usual procedure when there was inclement weather. The first 25 minutes of the lesson were therefore spent standing in corridors and moving between buildings in search of a suitable space. Exasperated, the teacher groaned, “What message does this send the students about their value and the value of their learning?”. This was the context within which Raheem and his peers were expected to engage with Syntaxa. For Raheem in particular, limited opportunities for literacy support at home added to the challenges he faced in developing his

literacy skills. When encouraged by the EAL teacher to practise the pronunciation of consonant digraphs with a family member he explained that his sister, the only English speaker in the household, would be unable to help due to work commitments. Raheem's capacity to meaningfully engage with Syntaxa was therefore consistently thwarted: by an interface that presupposed a level of traditional literacy he did not yet possess, by an institutional environment that conveyed ambivalence about the value of the intervention, and by linguistic conditions that limited opportunities to consolidate literacy learning beyond the classroom.

Vignette 3: Peter (Milborough High)

I can see that Peter – whose first languages are Cantonese and Mandarin – has beaten his time on the second round of an activity involving a series of grammar questions. Two clocks appear on the screen with the times written below. They signal that he completed the first round in 1 minute and 27 seconds, and the second round in 1 minute and 6 seconds. He is grinning from ear to ear and tells me he purposefully answered slowly during the first round – "I am bad at English, but very good at Maths!" He also uses the Google search engine to find the answers to questions, e.g. 'Is teeth singular or plural?'.

The emphasis on performance metrics generated by Syntaxa, along with their reinforcement in the classroom and broader school environment, encouraged students to adopt an exclusively efferent stance when engaging with the technology. In Rosenblatt's transactional theory of reading, the efferent reader is primarily concerned with "what he *[sic]* will carry away from the reading" (Rosenblatt 1978, p. 24). It is "the kind of reading directed entirely toward the end result" (Rosenblatt 1978, p. 25). Comparatively, the aesthetic reader "pays attention to—savors—the qualities of the feelings, ideas, situations, scenes, personalities, and emotions that are called forth" (Rosenblatt 2005, p. 11). Observations of these intervention

classes revealed that although students approached reading from an efferent stance; that is, with an outcome-orientated mindset, their focus appeared to be less on acquiring knowledge for long-term retention and more on immediate task completion. This tendency was influenced, in large part, by the design of the technology and its underpinning values. As exemplified by Peter's behaviour in the vignette, many students seemed to engage with the text primarily to satisfy its requirements and to complete tasks with maximum efficiency and accuracy.

There were around 50 different languages spoken at Milborough High and Peter was one of many students whose first language was not English. During the Syntaxa intervention classes he worked quietly, intensely focused on achieving high scores and maintaining a high streak. He did not seek help from the teacher nor engage with the other students. The task described, which required Peter to respond to a series of brief grammar-focused questions, was not particularly conducive to an aesthetic style of reading. However, even when presented with comprehension passages that might have encouraged more aesthetic engagement, Peter, along with his peers, maintained an efferent stance in their transactions with the EdTech. This tendency, as clearly illustrated in Vignette 1 and echoed in the observations discussed here, reflects the values embedded within Syntaxa, which implicitly prioritise the accumulation of streaks and high scores as the primary outcomes of reading – *this* is what students should "carry away" with them. Such an approach raises critical questions about how EdTech platforms such as Syntaxa may be reshaping literacy practices – particularly through gamification and reward-based systems – by framing reading as a series of tasks to be completed.

Peter's assertion, "I am bad at English, but very good at Maths!", suggests a self-positioning that significantly shaped his approach to the task. The reading transaction involves "not only the past experience but also the present state and present interests or

preoccupations of the reader" (Rosenblatt 1978, p.20), and Peter was clearly preoccupied with projecting a sense of progress. His self-perceived weakness in traditional literacy and confidence with numeracy led him to "game" the system by deliberately working slowly in the first round to create the appearance of significant improvement in the second. In doing so, he complied with the activity without fully engaging with its intended objectives. His self-perceived weakness in traditional literacy therefore contributed to shaping his digital practices, resulting in a transactional breakdown characterised by surface-level engagement. Rather than addressing his underlying literacy needs, Syntaxa obscured them behind gamified performance metrics such as speed, scores, and streaks, creating an illusion of progress while deeper learning challenges remained unaddressed.

Peter also used Google to find direct answers to questions he found challenging. For example, he typed into the search engine, "Is teeth singular or plural?", demonstrating a functional application of digital literacy to help navigate a gap in his traditional literacy (specifically, his grammatical knowledge). This moment marks another transactional breakdown between Peter and the text. According to Rosenblatt, meaningful transactions occur when the reader draws on their linguistic and experiential resources to actively and reciprocally engage with the text. As such, the transaction may falter when these resources are not adequately supported by the reading environment. In this intervention class, the key elements of the reading environment included the text, the reader, Peter's peers, and the teacher, who regarded her role as somewhat peripheral:

> The technology replaces the teacher who takes on a monitoring role, primarily motivating students to keep going from behind her desk. (….) Her understanding is that Syntaxa does the teaching – she tells me that, "from a teacher's perspective, it's not very teacher heavy". [Classroom observation notes, Year 9 Syntaxa]

This configuration of the learning environment, with the teacher adopting a peripheral, supervisory role and Syntaxa assuming the primary instructional function, is underpinned by a logic of personalisation that operates through mechanisms of "sorting" (Horvath & Steinberg, 2023). Students are not only physically "sorted" into, or excluded from, these intervention classes, but they are also "sorted" by the EdTech itself through "personalisation", i.e., by being assigned to a predetermined learning profile. This creates a fragmented model of learning in which peer interaction and teacher mediation are limited, and in which the breadth of possibilities for meaningful transactions is significantly reduced. This diminished practitioner presence contrasts sharply with Rosenblatt's emphasis on the importance of understanding and responding to readers' evolving needs:

> To lead the student to have literary experiences of higher and higher quality requires constant concern for what at any point he *[sic]* brings to his reading, what by background, temperament, and training he *[sic]* is ready to participate in. Literary sensitivity and literary maturity cannot be divorced from the individual's rhythm of growth and breadth of experience. (Rosenblatt 1960, p. 307)

Rather than enabling Peter to dwell in the learning moment and work through his uncertainty, Syntaxa's design failed to provide the kind of responsive scaffolding that might foster a rich transactional reading experience. The EdTech was unable to exercise "concern" for Peter's unique positionality; for his "background, temperament and training". Instead, he was left to navigate a predetermined pathway[8] that prioritised task completion over interpretive exploration. While Syntaxa presents itself as a tool capable of replacing some of the traditional teaching role, positioning students as independent users who can progress through reading tasks without direct teacher involvement, this model assumes a level of uniformity in

[8] Although Syntaxa adapts its instruction based on a student's ongoing performance, its responsiveness is confined to a set of 180 predetermined placement profiles.

students' needs that is at odds with the complex and diverse ways students engage with the EdTech. The teacher's reconfigured role, shaped in part by her own trust in Syntaxa's self-sufficiency, meant that opportunities for active mediation and support were largely absent. The resulting incongruity between the teacher's expectations and the pedagogical limitations of the technology contributed to a learning environment in which meaningful literacy transactions were unlikely to occur.

Conclusion

As the transactional breakdowns identified in our analysis illustrate, traditional literacy plays a significant role in shaping students' digital practices. This highlights a crucial tension within mainstream understandings of digital literacy, which often overlook its foundational ties to traditional literacy practices as articulated in Gilster's (1997) formulation. While definitions of digital literacy have necessarily evolved, our analysis underscores the continued relevance of traditional literacy and the need to view digital and traditional literacies as interdependent rather than discrete. Accordingly, the interplay between students' traditional and digital literacies must be accounted for when developing digital inclusion strategies, educational policies, and support systems that aim to foster equitable participation in digital spaces.

By examining an ideal case where technology is used to support traditional literacy, our findings demonstrate the significance of this relationship across both formal educational settings and everyday life. Crucially, this research underscores that, particularly in the context of educational technologies, meaningful support for traditional literacy requires designs that are attuned to the diverse and context-specific ways students engage with texts. Bridging the gap between technology and the complex literacy practices they aim to support demands a more nuanced approach to EdTech development.

Building on this analysis, we argue for a broader rethinking of how digital literacy is conceptualised and studied—one that demands deeper theoretical and empirical engagement with its relationship to traditional literacy. Future research would benefit from more sustained investigation into the complex interplay between digital and traditional literacies, moving beyond isolated analyses that examine the influence of one on the other. Instead, attention should be directed towards understanding how these literacies intersect and co-construct one another in real-world contexts. This is particularly pressing given that educational technologies are increasingly positioned as solutions to literacy challenges, often without fully accounting for the complex ways students navigate and integrate traditional and literacy practices. Addressing this gap requires turning back the page to reconsider the foundational role of traditional literacy in shaping digital practices. In the absence of such critical attention, such technologies risk reinforcing the educational inequities they are intended to ameliorate.

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