Literacy UKLA

Defining and seeking to identify critical Internet literacy: a discourse analysis of fifth-graders' Internet search and evaluation activity

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Abstract

Pedagogic focus is shifting increasingly from teaching students to search the Internet efficiently to encouraging critical Internet literacy, but this paper argues that these more complex and subtle skills are both challenging to teach and difficult to identify. The paper presents an analysis of the discourse of triads of fifth graders undertaking an Internet search task that emphasised decisions relating to the trustworthiness and relevance of websites. The analysis uses two lenses – the Vygotskian concept of *obuchenie* and Mercer's notion of 'interthinking' – to help identify discourse markers that could support teachers in identifying and teaching critical Internet literacy. More work is needed, but it is argued that if our goal is to develop critical Internet literacy, the concept of obuchenie helps us to understand the socio-cognitive prerequisites of group learning in Internet searching tasks, while the concept of 'interthinking' offers us a distribution mechanism that can be applied in helping students acquire the skills of independent and critical analysis as they carry out those tasks.

Key words: classroom discourse, comprehension, critical literacy, discourse analysis, new literacies, research methods, teacher education

Defining and teaching critical Internet literacy

As Coiro and others have argued (Coiro, 2003; Coiro and Dobler, 2007; Dalton and Proctor, 2008; Harrison et al., 2014), developing critical thinking in online environments is an increasingly important skill. But in many respects, critical literacy is more than just a skill – it is a sociocultural literacy practice that goes far beyond comprehension and into the domain of ideology. Critical language awareness, as Gee (1990) and Fairclough (1992) have pointed out, recognises that language is an immensely powerful tool in the construction of a nation's culture and values, and it seeks to explore, deconstruct and expose the mechanisms that drive and maintain the power relations within that culture. It is to these more complex critical abilities that I apply the term 'Critical Internet Literacy', and it is these abilities that I suggest shall be needed by those who use the Internet in the 21st Century.

From a cognitive perspective, many aspects of reading on the Internet are essentially the same as the reading process when reading a book. Word recognition processes are broadly similar, and comprehension processes are similar. From a Kintschian perspective, the constraint-satisfaction processes in comprehension and the processes of construction and integration are broadly the same when reading from a book or from a computer screen (Kintsch, 1998). But at this point, the similarities end. A large school library may contain 25,000 books, and of course the books in libraries are not only organised and catalogued logically; most have been edited by someone other than the author and revised by an expert before publication. The British Library contains around 25 million books – edited, organised and catalogued; the Internet, by contrast, holds around 2.5 billion web pages, most of which have not been through any external editorial process. How then are we to develop the competencies that will enable students to apply critical Internet literacy in this unregulated world, where authors can publish whatever 'fake news' they choose on websites that mask their true intentions (Marchi, 2012), and in which predatory and exploitative publishers of thousands of fake 'scientific' journals give automatic acceptance to papers (Burdick, 2017)?

Fortunately, some important work has already been done. There is not space here to cite all the key studies, but the Coiro et al. *Handbook of research on new literacies* (2014) provides a comprehensive review of the field, through a commendably broad set of methodological and theoretical lenses. Furthermore, Litt's (2013) review of research into Internet skills draws our attention to a 'second-level digital divide' between those who do or do not possess the "constantly redefined skill set" (ibid, p. 614) necessary to deal with the rapidly evolving interfaces and data structures that challenge the Internet user.

Researching fifth-graders' critical internet literacy – the background

The phrase 'digital literacy' has been in use since the early 1990s, and it therefore antedates the World Wide Web, i.e. the searchable Internet of text, graphics and other media that first became available to school students via the Mosaic interface in the mid-1990s. Paul Glister's book 'Digital Literacy' (1997) is widely regarded as the first publication that acknowledged that dealing with digital sources in the information age would demand more than simply an ability to read and write. It requires "the ability to understand and use information in multiple formats from a wide variety of sources" (cited in Bawden 2008, p. 19), and Glister recognised that digital literacy would require critical thinking and wariness about the validity of Internet sources (Bawden, op. cit.).

A number of detailed studies of school students' ability to make critical judgments of Internet sites have been carried out. The early study of Kafai and Bates, (1997) reported on how elementary school children interacted with the Internet by asking them to use searching skills and critical thinking to build an annotated directory of World Wide Websites for other children. Eagleton et al. (2003) were one of the first groups to publish a paper on Internet enquiry strategies that shared data on how middle school students dealt with the challenge of selecting search terms, evaluating relevance and presenting evidence.

More recent studies (for example Castek and Coiro, 2015; Dodge et al., 2011; Leu et al., 2015; Zhang et al., 2011) have looked in close detail at the real-time Internet search activity of school students, and have argued in the light of their findings for the need for more teaching of online strategies such as locating and synthesising information, but also for the explicit teaching of critical evaluation of online information. In Ireland, Dwyer's study of an approach to scaffolding Internet reading among children in a disadvantaged school community (Dwyer, 2010, 2013) made similar recommendations, but also developed a pedagogy based on triads of elementary school students, each of whom was allocated a specific role (Navigator, Questioner and Summariser). What Dwyer found was that when sixth-grade students understood and embraced their roles, their collective skills were far better focused than when this was not the case.

In a study that followed Dwyer's triad approach, Harrison (2015) slightly adapted Dwyer's roles. The new roles were Planner, Evaluator and Navigator, with the Planner having overall responsibility for managing the group towards its research goal, the Evaluator having the specific role of making sure that the group discussed how relevant and how trustworthy was the information on each web page visited, and the Navigator taking the lead on search terms and site selection. This study of UK fifth graders reported that student judgments of a site's relevance to a given research question were generally in agreement with those of adult readers, but that their assessments of a site's trustworthiness were often very different from those of adults.

In Harrison's (2015) study, seven triads of fifth-graders, mean age 11.6 years, from a mixed-SES suburb of a city in the Midlands of England were observed and voice recorded tackling a 25-minute Internet research task. The students in each triad chose and were given guidance as how to fulfil their roles, which were collectively to investigate six pre-selected Internet sites, and to seek information that would help them answer the question "How many stars can you see in the sky?". Two of the six sites gave detailed, trustworthy and relevant information that would provide a satisfactory answer to the question, two provided truthful (but misleading) information on how many stars there were in the whole Universe, and two were irrelevant and untrustworthy distractors (one gave a Horoscope, the other gave answers to the question from the members of the public that were essentially uninformed guesses, embedded among advertisements). To help guide the students in their task, they were each given a sheet of paper with the name of the websites, and an invitation to record a score out of six for each site on two variables: first, how relevant the site was to their research question, and second, how trustworthy they felt was the information on the site.

The students used these prompts to frame their discussions about each site, but in their wide-ranging conversations, they agreed, disagreed, focused, lost focus, read with understanding, read without understanding, attended to the task and forgot to attend to the task. Harrison (2015) collapsed much of the discourse data into a simple dichotomy of 'more desirable' and 'less desirable' student activity. Data from the student conversations and field notes were used to build up a list of more– and less–desirable strategies that the students exhibited during their search activity. The strategies fell into three broad groups: Internet reading strategies, comprehension/inference strategies and group process strategies. These are shown below in Figure 1.

The importance of looking at discourse

The aim of the present paper is to look more closely at the discourse data, and there were two factors that led to this decision. The first was that I had been rereading Vygotsky, or more specifically, I had been reading about the implications of how we translate and how therefore we understand the Russian word *obuchenie* (Cole, 2009; Wertsch and Sohmer, 1995). Having started out as an academic with a strong interest in Piaget, and with a focus on the mental operations of individuals, I had become increasingly interested in trying to

Skill area	Tactic	Undesirable	Desirable
Internet reading strategies	Read task carefully	Proceed with poor understanding of task	Proceed with good understanding of task
	Read text fully	Read every word aloud	'Let's skim'
		Neglect to scroll down	Scroll down and read all of the text
	Be alert/suspicious	Attracted to eye candy	Mistrust advertisements
		Fail to consider author's purpose	Mistrust over-friendly tone
Comprehension/inference	Read between the lines	Fail to monitor comprehension	Monitor individual and group comprehension
		Make premature decisions	Make late decisions
		Fail to integrate information across source(s)	Integrate information across source(s)
Group processes	Collaboration	P-E-N Roles not clear	P-E-N Roles clear
		Fail to fulfill roles	Fulfill roles
		Ignore opinions of other group members	Make joint decisions on relevance and trustworthiness

Figure 1: Internet strategies of fifth-graders (from Harrison, 2015). [Colour figure can be viewed at wileyonlinelibrary.com]

connect a Piagetian perspective with that of Vygotsky, and in particular in Vygotsky's insistence on viewing learning as primarily a socio-psychological phenomenon. Very briefly, what Cole and Wertsch and Sohmer try to explain is that the Russian word *obuchenie*, which is often translated as *learning*, is actually untranslatable into English. The word *obuchenie* has a much more complex set of meanings and can be translated not only as *learning*, but also as *education*, *training*, *teaching*, *studying* or *nurture*. So when Vygotsky argued that *obuchenie* takes place first on a social plane and then on an individual plane, knowing more about how the word is used in Russian, we can understand what Vygotsky means in much more complete way. So as we look at the group processes of student learning using the Internet, we can see at once that developing an understanding is an activity that must involve sharing through language – or at least making use of a shared semiotic system. So it is much easier to see that from a Vygotskian perspective not only are the group processes a social activity, so comprehension too is a social activity, and that reading is not only a cognitive but also a constructive and a socio-cognitive activity.

The second impetus to a deeper analysis of the discourse data was a conversation about Figure 1 with a colleague, who asked whether I was planning to link my analysis to Neil Mercer's 'inter-thinking' – the process in which students develop a shared understanding, through talk, independently of the teacher (Mercer, 1995). I was very attracted to such an approach, since the goal of critical Internet literacy has to be for students to develop independence and spontaneity in their critical interactions with new media. To put it another way, I wanted to see if a closer analysis of the discourse data could highlight discourse markers that other teachers might then be able to use as part of their own pedagogy – either in identifying the skills of critical Internet literacy, or in order to help others to develop them. Mercer made it clear that constructive dialogic discourse does not just occur spontaneously in classrooms; it happens only when the children have explicit aims for their talk, ground rules for speaking and a task that they consider worthwhile (Mercer, 2009). My hope was that a closer discourse analysis would provide evidence on the extent to which the three roles of planner, navigator and evaluator might have helped the students to keep on task, and whether the triple focus on research question, the concept of relevance and the notion of trustworthiness had led to constructive and collaborative problem solving, and to 'inter-thinking'.

Can we identify discourse markers of critical Internet literacy?

The next stage was a reanalysis of all seven recordings, which summed to a corpus of approximately 26,500 words, with a particular focus on single utterances and dialogic exchanges that appeared to give evidence that related to the focal areas presented above in Figure 1. In some cases, there were many candidate utterances; in others, there were few or none, since the focal area referred to an absence rather than the presence of one kind of activity or another.

Tables 1 and 2 show the outcome of this re-analysis. Clearly the categories I have chosen are subjective, as is the choice of discourse segments, but the goal here is not to offer a taxonomy that is comprehensive or that has shown itself to have high inter-rater reliability. The intention is rather to offer a descriptive illustration of aspects of students' Internet searching strategies that might have pedagogical utility, highlighting insights that might be helpful to teachers as they attempt to offer guidance to their students in the quest to develop critical Internet literacy.

Table 1: Internet research strategies and candidate monologic discourse markers

Internet research strategies	Candidate monologic discourse markers
Use website reading strategies	Chloe: "Shall we, like, skim read and see if we can find anything ….?"
Consider language of websites	Cameron: "I don't trust this already – the writing looks informal."
	Paige: "It's trying to sound like it's your friend. this is just blah-di-blah."
Consider provenance and aims of websites	Ben: "Already I don't trust this website- because anyone can put anything on it."
	Paige: "Sometimes titles can be deceiving- because, like, sometimes *Answers.com* because it says '*Answers'* we think it has the answer." [but it doesn't]
	Ben: 'I don't trust *Wikipedia*!'
Comprehension/inference	
Clarify/summarise content	Chloe: 'I don't think it's relevant because it doesn't say how many stars there are."
Review content across sites	Lucy: "Let's look at them all again. …we need to go on the one we trust most and look at that again."
Group processes	
Collaborative decision making	Logan: "We've got to work together … 'cos working together is key to answering the question."

Before I discuss what is in Tables 1 and 2, let me be clear: not every moment of every recording suggested that the students were engaging in critical Internet literacy or dialogic inter-thinking. There were long periods of silence, as the students read the text on the screen. There was an excruciating period of 5 minutes and 8 seconds during which one student read aloud the whole of a Wikipedia entry, while his two classmates exchanged increasingly frantic glances and raised their eyebrows in silent desperation. There were triads in which wonderfully intelligent reading comprehension, discussion and group analysis failed to lead to an answer to the research question, because the Navigator had neglected to scroll down to the text at the bottom of the page to the paragraph that contained the answer. But there was also what I felt was compelling evidence of intelligently applied reading strategies, sensitively cautious treatment of Internet sources, and of comradely, supportive and goal-focused collaboration.

Table 1 is in two columns – first, the research strategy that I think the discourse segment illustrates, and then a column indicating some monologic discourse markers that illustrate that skill in action. Table 2 lists the same skill areas, and some examples of dialogic discourse that are indicative of group thinking, or possibly Mercer's 'dialogic inter-thinking' in that area. In both tables I have used the word 'candidate' to indicate my tentativeness about the labelling. In that sense, I am inviting the reader to decide for himself or herself to what extent that discourse extract does or does not illustrate the research skill in question. I feel particularly cautious about labelling talk as 'dialogic inter-thinking', when Mercer used the term to refer to knowledge creation. I felt that there was plenty of evidence of collaborative and constructive thought in the transcripts, but I also believe that that it is incredibly difficult to identify 'knowledge creation', where that phrase refers to an identity relation, and is not simply a metaphor. The "candidate monologic discourse marker" segments in Table 1 are intended to illustrate a single student providing evidence relating to a skill area; the "candidate dialogic inter-thinking" segments in Table 2 are intended to provide evidence of a conversation or exchange that provides evidence of collective thinking that relates to that skill area.

Discussion 1 – candidate monologic discourse markers

As has already been indicated, the students exhibited both undesirable and desirable behaviours in their overall web reading strategies. The "Internet reading strategies" quotations reveal some spontaneous use of reading strategies that have perhaps transferred over from book-reading skill instruction. Chloë says "Shall we, like, skim read and see if we can find anything?", and this is certainly a book-reading skill, but it must be admitted that in these Internet study contexts, younger students rarely articulated their strategic thinking in this way. It was much more common for them to simply point to the screen, or to ask a question that implied a mouse-click or cursor movement. As I said above, one student read aloud for over 5 minutes, though we should not necessarily interpret this as a total skill failure. In the days when researchers videotaped undergraduate study skills, I recorded a university student reading a text book for 1 hour in order to attempt to answer a research question that could have been dealt with

Table 2: Internet research strategies and candidate dialogic Inter-thinking

Internet research strategies	Candidate dialogic Inter-thinking
Use website reading strategies	Jessica: "Let's just look and see if it answers our question: because our question is 'How many stars can we see in the sky?' So we don't just have to look for the biggest amount of numbers …."
	Hannah: "Yes- let's just skim-read it."
Consider language of websites	Chloe: "Why are there cars [on this website]?"
	Jessica: [on the car advertisements] – "I don't trust it … They're just trying to get money out of the website."
	Hannah: "It's relevant- but this is just blah-de-blah. I don't trust it at all. Because the language they use is like I would talk to Logan or you guys on the playground."
	Chelsie: "This one is concise; the other one has got larger words and stuff; so I trust this one."
	Olivia: "*Sky and Telescope* did have the most scientific language … but the best way to get information is to look it up in a book."
	Logan: "*Wikipedia* gave really really good content- but it was so irrelevant."
	Olivia: "Yeah- it was nothing that we could use."
	Logan: "If you're doing your project, and you copy it all from Wikipedia, you probably won't get any marks."
Comprehension/inference	
Clarify/summarise content	Chelsie: "We don't need to know that!"[ie it's irrelevant; repeats research question]
	Olivia: "Maybe it's a bit more relevant, but it doesn't say what we want it to say."
	Logan "I trust it but the relevance of the web site is low."
Monitor own/others' comprehension	Hildegard: "Are you actually taking any of this in?"
	Amie [*grins*]: "No!"
	Amie: "But this is all about stars, not about how many you can see-"
	Hildergard: "Exactly."
Group processes	
Work on role clarification (Planner, Navigator, Evaluator)	Amie: "I'm the Evaluator, so I'm trying to see that we're doing the right thing."
	Lawrence: "I'm the navigator and you're the planner …"
	Hildegard: "I'm supposed to be telling you guys what to do."
Collaborative decision making	Ben: "It's probably the best one [site] we've seen so far …"
	Lucas: "Hmm … but none of them have been really accurate, because …"
	Chelsie: "Let's go back and look at the positives and negatives about them. This one you can tell it's real because it's got a caption below the picture."
	Olivia: "Yeah."
	Chelsie: "And you know the other web site, some web sites just want you to 'like' them on Facebook."
	Olivia: "So we've gone through all the web sites, and we've gone through all the relevant …. *EarthSky* definitely answered our question and gave us extra information."
	Logan: "Yes- *Sky and Telescope* and *EarthSky* are similar- did you notice that? They are similar and they are the most relevant."

in 2 minutes had she used the book's index. Nevertheless, it is worth noting Chloë's question from the point of view of its potential for post-hoc teacherly guidance.

On the issue of adopting a critical approach to web content, these students did appear to demonstrate caution and thoughtfulness. There was – at least on a surface level – a strong global disposition of mistrust towards web material, with a number of comments that might be useful for all teachers to share and discuss with a class. Teachers might want to ask their students whether it is wise or even reasonable to mistrust any site on principle, as Cameron's "I don't trust this already – the writing looks informal" would suggest. Equally a teacher might ask her students whether

Ben is over-cautious in expressing a global mistrust of Wikipedia. Similarly, a teacher might ask her students whether they agree with Paige's global coolness towards 'Answers.com'.

In the Comprehension section, I have to confess that I was surprised not to be able pick out many examples of discourse that I felt demonstrated implicit or metacognitive comprehension strategies. Perhaps, again, this is simply because these are not readily expressed by fifth graders. There were many discussions about relevance, but most were global; Chloé's reference to a specific point of detail – in her case a lack of evidence – was potentially helpful to her classmates. From a teacherly point of view, it is perhaps the word 'because…' that was key in the phrase "I don't think it's relevant because it doesn't say how many stars there are." Lucy's encouragement to her classmates to review all six sites: "Let's look at them all again … we need to go on the one we trust most and look at that again", was perhaps one of the most useful examples of discourse that could be shared as an example to others. The group already had a favourite, but Lucy was suggesting a review that would avoid premature closure – an extremely important skill, and one that was stressed as important in Figure 1.

I have nominated only one monologic utterance in relation to group processes. Understandably enough, the most important data in this area is over in the dialogic column. What is fascinating about Logan's plea "We've got to work together… 'cos working together is key to answering the question" is that his group was one of the most disparate in terms of agreement over which websites were most relevant and most trustworthy. What is says would delight his teacher – but it is almost as if the target audience for his suggestion is himself as much as his classmates.

Discussion 2 – candidate dialogic interthinking

What do the segments of dialogic discourse reported in Table 2 tell us about the group processes that went on? They certainly suggest that there was some collaborative discussion, but do these brief snatches of discourse provide any evidence of constructivist learning? Do they suggest a contribution from a "More Knowledgeable Other" that Wood et al., (1976) argued provides evidence of scaffolding in constructivist learning? Do they provide evidence of Mercer's dialogic interthinking?

I think that the segments of conversation between Chloë, Jessica and Hannah in the "Consider language of websites" section offer interesting possibilities in relation to these questions. In their discussion of the trustworthiness of a site that contains car advertisements, at least three interrelated points are made: first, that the advertisements are irrelevant to their quest, and should therefore be ignored; second, that the presence of advertisements in itself suggests that the site owners are more interested in money than in sharing information; third, that informal language ("the language … like I would talk to Logan or you guys on the playground") is in itself not to be trusted, even if the content is relevant to their quest. I think that, in the way that this conversation develops, there is a kind of constructivism: a shared understanding that the previous point is accepted, and that the next point builds on the previous one. A similar argument can be made about the discussion that includes a comment on Wikipedia.

Further on in the "Consider language of websites" section, Chelsie initiates a discussion towards the end of their quest, comparing two sites and preferring the one that is 'concise' to the one that 'has got larger words and stuff'. Here she is perhaps showing a metacognitive awareness of the need to avoid trusting a site with complex language that she does not fully understand. In fact, the more complex *Sky and Telescope* site is one of the two that contains an answer to their research question. Olivia, however, does not refer to this; in her response she says "*Sky and Telescope* did have the most scientific language…but the best way to get information is to look it up in a book" thus avoiding making Olivia embarrassed by returning to that site, and diverting the topic to printed books, which would be their next port of call if the research task were a real and not a constrained one. Logan then connects with the theme of how the group would deal with an authentic research question by referring to Wikipedia (a site which in this case contained trustworthy but irrelevant material). Olivia agrees with Logan "Yeah- it was nothing that we could use" and Logan concludes this part of their discussion with a comment that might be true, but that has little relevance to the research task in hand: "If you're doing your project, and you copy it all from Wikipedia, you probably won't get any marks." There is a kind of prioritising of group identity here that overrides the research task. The scaffolding here supplied by the More Knowledgeable Others is perhaps more attentive to their classmate's well-being than her knowledge of how many stars can be seen in the sky.

Sometimes a transcript does not at all completely convey the full meaning of an utterance. In the Comprehension/ Inference section, Hildegard's question to Amie, "Are you actually taking any of this in?" and her answer, 'No!' are expressed with humorous exasperation, and sound more like a shared sisterly chat than an inquisition. In fact, the exchange can be seen as a dialogic example of joint comprehension monitoring. A different example also implies joint comprehension monitoring, but reverses the polarity, and focuses on the positive. Amie makes a

point about what the site is or is not saying, and Hildegard's 'Exactly' gives a confirmation of shared understanding.

Is there any strong evidence of Mercer's dialogic Inter-thinking? Perhaps the best candidate is another exchange between Chelsie, Olivia and Logan that I have placed at the end of the Group Processes section. Chelsie initiates a discussion about the need to review their previous decisions before coming to a final answer to the research question. In terms of group processes and collaborative learning, this is a significant dialogic move, but does it lead to 'inter-thinking'? Olivia agrees to her suggestion ('Yeah'), and Chelsie goes on to make a general point about some sites simply wanting them to 'like' them on Facebook. But her invitation to review gives Olivia an opportunity to guide Chelsie back to *EarthSky*, one of the two sites that in fact holds the answer to their quest, but that Chelsie found a little difficult to understand: "*EarthSky* definitely answered our question and gave us extra information." Logan immediately makes a further "More Knowledgeable Other" move: "Yes- *Sky and Telescope* and *EarthSky* are similar- did you notice that? They are similar and they are the most relevant." This insight is presumably addressed to both the other group members, but while it is possibly recapitulating for Olivia, it is certainly extending the understanding of Chelsie. In this respect, we could argue that the exchange demonstrates knowledge generation, and thus inter-thinking in Mercer's terms.

Implications

Has this reanalysis been useful? Has it offered additional insights into the concept of *obuchenie*? Has it provided any examples of 'Inter-thinking' in an Internet search context? Has it provided potentially useful discourse markers for teacher of critical Internet literacy? The final question is not one for this author to answer, but a number of points can be made.

First, I suggest that the discourse data does, collectively, provide strong illustrative evidence of the value of encouraging students to engage in Internet searching in triads, and with designated and distinctive individual roles. Such an approach is entirely congruent with Mercer's definition of inter-thinking, for which his *Thinking Together* website (Mercer, 2017) offers teachers a wide range of teaching and publication resources. The Zhang et al., (2011) study of fourth and fifth graders who were given detailed instruction in the www.dot technique produced only modest outcomes, and perhaps this was at least partly because the research outcome measure was based on a website judgement task that was carried out by each student independently. Coiro et al., (2016), in their work on personal digital inquiry, make the point that giving students clear roles and responsibilities and training in group collaboration is only part of the job; in their view, if we want our students to engage in purposeful, critical Internet inquiry, it is increasingly important for teachers to offer students opportunities to select their own questions on which to focus their efforts, to maximise motivation and engagement and also to accept a range of multimedia outcomes. As Dwyer noted in her two-year study (2010), it takes time for students to gain the skills and confidence necessary for participation in self-directed Internet inquiry, and that learning will be deeper and more sustained if the students have high motivation and personal investment in their work.

I would suggest that although the data in the present study are modest in scope, the students did demonstrate a high degree of engagement and provided many examples of collaborative learning that could usefully be analysed from a Vygotskian perspective: the students were teaching as well as learning; each role – planner, navigator and evaluator – had a component of higher order thinking, and there were a number of examples of the students leading the learning of others as they executed their roles. To this extent, therefore, I suggest that the data did provide a number of examples of bidirectional learning that would harmonise with the concept of *obuchenie*.

Does the discourse data demonstrate 'inter-thinking'? I am not sure. There are a number of examples of collaborative discussion, and some of these show a building up of shared knowledge. But is there any knowledge creation? Is there evidence of depth of response or depth of analytical thought? It is not easy to say. Perhaps the scale of the task was too small, and the opportunities for depth of sustained engagement too minimal for such an argument to be made.

If our goal is to encourage self-directed learning using new technologies, I share the view of Coiro et al., (2016), who argue that we need to be promoting critical Internet literacy, and doing so through projects that have importance and personal meaning for students, with outcomes that matter. At the word recognition level, reading on the Internet may have much in common with reading a book, but at the much more significant level of knowledge building in a 'post-truth' world, critical Internet literacy will be an absolutely vital skill, one that should be on every teacher's agenda, and I would submit that for teachers, an understanding of the reciprocal nature of *obuchenie* and familiarity with the pedagogy of inter-thinking will both be helpful in advancing that agenda.

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