Cutting through Layers of the BBC "ONION Street": Children's Use of Homework Message Boards Out-of-school

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Abstract: We explored children's spontaneous use of the Onion Street Maths and English message boards out-of-school. These are open-access, study support forums that are widely accessed and well-regarded by teachers and students in the UK. 416 messages were collected on the Maths board and 893 messages were collected on the English board. Sustained engagement was rare. Around 90% of user identities contributed only once. Nearly two thirds of threads on both boards did not get any reply. Sequential observation and content analysis were used to identify themes emerging in the discussion. Results revealed that although children came to the boards mainly for seeking help and asking questions, discussions around different curriculum subjects (Maths and English) were structured differently. Because of children's limited skills in asking questions, the boards had limited value for learning conversations. However, sharing emotional reactions to study and examination may still have made the resource a useful one.

BBC ONION Street

The message board is a handy and low cost online asynchronous communication medium that is popularly used for people asking questions and sharing information and proficiencies online (e.g., Yahoo message boards, Google message boards, BBC message boards, etc.). Meanwhile, with the greater use of Internet (Livingstone, 2005), teenagers make up a considerable number of active users on message boards. In this study, we explored children's spontaneous use of the BBC message boards which are targeted at 11 to 14 years old. The bbc.co.uk website is the UK's most-visited digital destination used widely by both adult users and child users. Its school section provides many kinds of information and activities for children and young people from 4 to 16+ years old, including multimedia learning activities, study and revision tips, online assessments, message boards and so on. These online learning resources are usually used and recommended by school teachers when they help their students to revise, especially before exams. Because these resources can be freely accessed through the Internet, they support children's learning both at school and at home. 'Onion Street', in the school section, is an online asynchronous communication system which is linked closely to other BBC online and informal learning resources. It is a popular place where UK children can get advice on schoolwork and support on personal issues through the Internet out-of-school. They can also share ideas and develop friendships with other people of the same age. Therefore, Onion Street potentially supports children's authentic networked learning — out-of-school and in their everyday life.

In this study, in order to understand how the asynchronous communication medium worked for students in an out-of-school learning context and to explore its prospects, the first research question was how discussion patterns and content varied in two different discipline-based boards: Maths and English, and especially how the discussions helped users to construct their knowledge both individually and socially in these different subjects. The second research question was to find out to what extent the message boards supported genuinely evolving discussions. Also, because the message boards provided the students with a space to talk with other students with shared or similar school experiences, the content in the board could reflect the students' real concerns and interests from their daily school and out-of-school learning experiences. Therefore, in order to capture and understand children's emerging learning cultures, the third research question addressed what the exchanges on the board revealed regarding the prevailing concerns of students in this age group when they were confronting private study out-of-school. In more detail, this study looked at how different varieties of postings were made by the students. Before exploring these three research questions, current understanding of children's relationships with digital media and, particularly, children's out-of-school learning experiences with networked media need to be reviewed.

Children's engagement with digital media out-of-school

With the significant increase in children's access to the Internet (ONS, 2003) and the UK government's strong belief that technology will play a major role in transforming UK children's learning experiences (DfES, 2002), many children are living in media-rich homes and their relationships with media are changing rapidly. Studies of the media-saturated family have identified an important change: namely that in public spaces, such as the living room, TV has given way to what Livingstone et al. (1999, 2002) call "bedroom culture": that is, one

that provides media-rich, personalised opportunities for safe and entertaining identity expression and peer-focused relationship exploration (Livingstone, 2002). Such increasing "privatisation" of media results in a transformation of the private home into permit a media saturated, individualised leisure culture. Moreover, the uses of networked and communication-orientated media (e.g. Mobile phones, email, MSN messenger, discussion forums and chat rooms) occupy more children's leisure time at home. Regarding the learning potential of using the networked and communication-mediated media, researchers and designers (e.g., Scardamalia & Bereiter, 1994, Scardamalia 2003) have considered how to design networked media, construct and evaluate the learning community, and propose design guidelines. Furthermore, these experiences which are characterised as self-initiated, inventive, and spontaneous (Hsi, 2007) led the children to be more competent and confident users of those media. Somekh et al (2002) propose that networked media, like the virtual classroom, have enabled students to work at their own pace, from school as well as home, thereby 'empowering' these students. Social connection and communication have always been of fundamental importance to teenagers. Accordingly, these experiences have also enlarged the scope and scale of the children's social worlds (Lyman, 2004; Wasko, Philip, & Meehan, 2001).

Academics, educators, and politicians emphasise the importance of home in relation to children's academic achievement, because the home cultural background can be different from school practice. Therefore, many researchers stress that a good relationship between home and school is important; although roughly imposing a school model of learning onto children's home learning will lead to the loss of an important part of learning (Lave & Wenger, 1991; David, 1998; Maddock, 2006). According to Forgatch and Ramsey (1994), homework is an important component in children's academic achievement. Communication and involvement among teachers, children and parents are supportive to the home school link (Caddell, 1996; McNamara et al, 2000). The effective home school link is likely to empower young people by involving them in a process of consultation and initiative development to increase feelings of ownership and responsibility (Smith, 2000; Caddell, 1996). Given those considerations, we might argue that effective use of networked media connecting students with teachers and peers to collaboratively work on school work could contribute to a good home to school link. Furthermore, Somekh et al. (2002) declare that the uses of virtual classrooms reveal the potential of learning without walls and, through home access to the learning resources, make learning more flexible. If online resources are available together with guidance and support from teachers, whether face to face in the classroom, or via electronic media, opportunities for independent learning are maximised and students have more choice and flexibility about how and when to work according to their individual preferences (Somekh et al., 2002). Referring to the success of using networked technology to support home/school links in Somekh et al.'s research (2002), we could further find out how networked open discussion could support children's social and learning activities out-of-school.

Against this background, the users of Onion Street were presumed to be self-initiated users living in a media rich home environment suited to organise their personalised learning. Additionally, they are expected by designers, parents, teachers and academics to learn effectively through this open and public text-based communication media: Onion Street.

Data collection

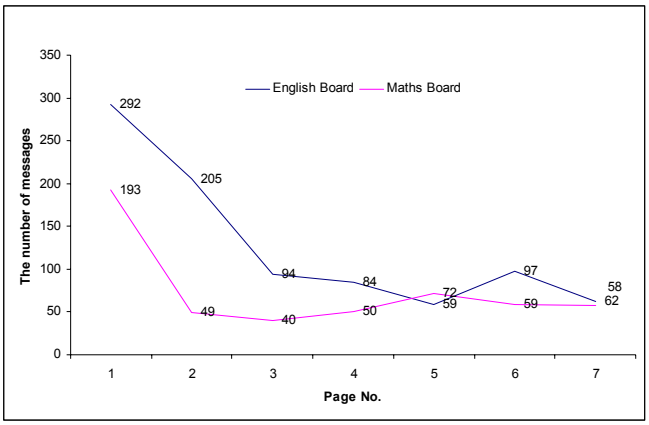

Figure 1. The number of messages/25 discussion threads (discussion page).

All the users of the message boards must have registered user identities by providing their birth dates to prove they are at the boards' targeting ages. All the message boards are topic centred in two sections: General topics (e.g., Talk It Over, KS3 Bitesize 11-13) and Subject topics (e.g., English, Maths, Music, etc). In every message board, there are 25 discussion threads on each page ('thread', instead of meaning a thread of messages, was defined by a new starting message no matter whether it gained replies or not). The number of pages in each

board depends on how many threads the students have posted in all. The threads are listed sequentially from the most recently replied or posted to the least recently replied or posted. To protect the users' privacy and safety and to make sure that the discussion focuses on the topic, there is a pre-moderation period before a newly-submitted message appears in the board. During the pre-moderation period, a new message will be displayed as a "queued message" only, with a posting date.

In this study, messages on the Maths message board and the English message board were collected before UK children's national SATs exams in the first week of May, 2006. There were 416 messages from 175 discussion threads on the Maths board and 893 messages from 175 threads on the English board. Figure 1 illustrates how the number of messages varied every 25 discussion threads, which are separately displayed in each page. From the diagram, we see that even though there are more messages created on the English board than the Maths board, a similar trend tells us that the first discussion pages in both boards (which are likely to be browsed by the user when they first get to the boards) are the most popular pages. Moreover, we can see that the number of messages in the page 3 to 7 remain relatively stable in both boards. Hence, the data from page 3 to 7 can be representative to the rest of the discussion pages which are not included in the whole data set.

Data analysis

The data were analysed at two levels. First, we quantitatively measured the 'traffic' of boards: that is, the density of the message board content and the density of users' participation. Second, content analysis was used to classify the characteristics of the discussion found on the boards.

'Traffic' on the boards

Table1: Density of Content.

	Maths message board	English message board
Average length of thread	3.0 messages SD=5.71 t=7.04	5.4 messages SD=16.59 t=4.12
Average length of message	44.52 words SD=44.25 t=20.98	66.00 words SD=81.26 t =22.58
Percentage of threads with replies	32.0%	44.8%
Average Number of days to have a new message added to the board	2.23 days/message	3.47 days /message

From table 1, we can see that there are generally more replies in an English board thread than a Maths board thread, and an English board message is usually longer than a Maths board message. When coming to the average number of days to have a new message added to the board, we can see that both boards evolved at a very slow pace. However, if the opening thread message and the first reply message are ignored, the average number of days to get a message added significantly reduced to 1.03 days/message on Maths board and 1.45 days/message on English board. Pre-moderation period could explain this change. Pre-moderation meant that the opening thread message waited longer to get its first reply message. But once it got replied, the users participated more frequently.

Table2: Density of Participation.

	Maths message board	English message board
The number of participated identities	345 user identities	416 user identities
The number of user identities who only participate once	262 user identities	298 user identities
The average number of messages contributed by the child users	1.44 messages	1.87 messages

Table 2 illustrates how the participants are distributed on the message boards within a fixed period of time. On the maths board, less than one fourth of the total user identities (24.05%) posted more than one message on the board. Only 29 (8%) user identities came back to the board again where this return means they entered the board in different days. 54 user identities who posted more than one message on the same day. In summary, more than 90% of user identities came to the board and did not come back and contribute again. On the English board, more than a quarter of the total user identities (28.37%) posted more than one message. And

only 54 user identities posted message on different days. Therefore, similar to Maths board, nearly 90% of users came and never returned to contribute again.

Characteristics of the discussion

Beyond quantitative measurements of users' participation and the message board visiting dynamic, how users generated learning and a social culture through discussion on the message boards was further explored. Content analysis was conducted in order to categorise the messages on both boards.

1. Maths board:

Based on a content analysis, the maths discussion threads were categorised into five themes: "General help", "Topic help", "Questioning", "Offer help and suggestion", and "Social chat". Table 3 explains each category in more detail.

Table3: Maths board threads themes.

Theme		Definition & Example	Proportion of total corpus
Learning discussion	General help	State their needs to get help in maths subject without clarifying any specific maths topic E.g. *I am in year 10 and I am really bad at maths, the biggest problem is that I have exams in a month. What can I do?*	32.9%
	Topic help	State their needs to get help on a specific maths topic without any specific information E.g. *i need help with fractions but it ent come up on the board so im sendin another 1… anways this is what i need help with… multiplyin and addin together fractions… im goin a bit write back if you know the answers*	24.5%
	Questioning	Have a complete maths question written in the message E.g. *I have homework I dnt get it1! OK, this is what I have to do….* *Add 1+1=2 2+2=4 and you do that all d way 2 1000. what is the most simple way to do that?*	19.7%
	Offering help	intend to offer help, learning strategies, tips and learning resources to others E.g. *hi, everyone I am in year 8 but my math teacher keeps saying to me that I should be in year 11 because of how good I am at maths. So if anyone has any problems with their homework then I sam the one to come to. I come on here most days so start sending your messages*	3.5%
Chat-style Discussion	Social chat	Looking for social chats instead of any particular replies about maths E.g. *my head is killing me I have done so much revision*	17.9%

- General help

Among the whole discussion data, nearly one third of posts were in the general help category. Because users did not articulate the specific maths topic they needed help with and did not further update replies afterwards, more than three quarters of discussion threads in this category failed to get any reply. In order to understand the failure of sustaining the discussion in this category, the motivation for user to post general help threads are further investigated. The following principal themes were identified:

a) Time pressure from exams: Significantly, more than half of general help threads were initiated because of perceived time pressure from exams. In their messages, they often mentioned '*exams are coming up*', '*exams in next week*' or even *'HELP ive got a maths exam in an hour*'.
b) School and peer evaluation: A quarter of threads referred to their general school or classroom experiences, especially the difficulties they encountered at school, such as '*my class are all going to fail*' or '*the new teacher doesn't care about teaching us*'.
c) Feelings about learning and achievement: These postings were explicit reference to emotions generated by the personal activity of study. For example that they felt depressed with their maths achievement. '*I hate the subject and I cant do it.*'

Users who posted general help threads, needed help but they did not really sure what could really help them.

- Topic help

Topic help threads were another kind of frequently posted threads by users. Here they required help with a specific topic. The common motivations to post threads were:

a) Time pressure from exams: This is still frequently mentioned in threads; as in: '*can anyone do trigonometry coz I av sats 2morrow'*.
b) Homework and coursework completion is also frequently a reason for posting the threads; e.g.*, 'im in yr 10 nd needs help on my coursewrk with the number stairs. Fanxs'*.

Even though it involved specific topics to discuss, the reply rate in this category did not increase significantly. Especially threads asking about algebra such as angles, circumferences and so on: these did not attract replies. But compared with general help threads, the specific topic help pursue could lead to quality replies such as maths procedural knowledge discussion.

- Questioning

Questioning threads were more likely to get replies than the former two categories of threads. Because users who post questioning threads were clearer about their needs, they were more likely to update their replies afterwards. In questioning threads, users were far less likely to express their stress from exam time pressure. Instead, most questioning threads were initiated because of homework, coursework or scheduled revision work. The quality of replies was also better; it included both maths procedural knowledge discussion and conceptual knowledge discussion.

However, the reply rate (40%) was still not very high. One reason for the low reply rate might be the age difference among users. Both boards were targeting at age from 11 to 14. All users perhaps come to the board with their personal interests with limited patience. The relatively older users may not want to spend time on simple questions posted by young users without any reward. On the other hand, the younger users might not be capable of solving the older users' questions. Additionally, because the boards did not provide editing tools to format the maths answers, the users needed to spend extra time on putting their message in a readable format. This could challenge the child users' patience.

- Offer help and suggestion

Even though there were only 5 threads trying to offer help to other child users. 4 threads got replies. But, none of them were sustained by the host offering help to others, the "offer help" posts seemed accidental without giving more information on their proficiencies, saying things like '*Need any help with ur maths work? i am here to help*' or '*Need Eny Help Tell ME And I'll Help*'. However, these accidental posts did not discourage the replies expressing help users needed. One offer help thread even got 51 replies which was the longest thread among the Maths board data.

- Social chat

In the social chat category, most threads were still not replied to. The messages were more like 'dip-in' chats which did not expect serious attentions from others and the people who initiated the threads did not pay attention to it later either. But exam time tension was still the main reason for child users posting on the board.

To summarise, more than 80% of threads on the Maths board addressed child users' needs for help and advice on their maths work closely linked to the learning progress they made at school. About one third of threads clearly expressed the time tension from exams. This time tension urged them to talk with others for help or simply seeking social chat with peers who might be in the same situation. Because the discussion developments were delayed by the pre-moderation process, the users are not well inspired to contribute to the discussion. Hence, the users did not perceive this board as a reliable learning environment, but rather a place to release their stress for the exams and to talk about their school life.

2. English board

Maths learning is often more about 'yes *or* no' questions, while English is about listening, speaking, reading and writing with more 'yes *and* no' questions. Therefore, in contrast to the maths board categorisation, there were more discussions on English board categorised into Chat-style discussion and there were more sub-themes in this chat-style discussion category.

Table 4: English board threads themes

Theme	Definition & Example	Proportion of each category

Learning Discussion	Topic help	Asking for help with a specific term or comprehension with a specific piece of English paragraph. E.g. *yoh* *watz vivid vocabulary* *i no datz borin but plz tell me?*	44.2%
	English literature discussion	Invite people to discuss about English literatures. Instead of purely looking for others' replies and opinions, they gave out their own insights first. E.g. *Heya!!!* *Just a little thought on Inspector Goole from An Inspector Calls. It seems near the end of the play he is distressed because he "doesn't have much time". Then he leaves and we discover he wasn't a real Inspector, and THEN the girl dies…I told you it was far-fetched.* *Your opinions please* *Thank you* *IntoTheSpotlight*	9.2%
Chat-style Discussion	Exam-initiated chat	Look for people to talk about exams, exam results and revision tips. E.g. *hi is anybody doing richard the III for their english exam i just wanted to check i kno everything about it. please reply thanks x*	23.9%
	English interactive game	Set rules for the whole thread in order to establish regulated interactions in the thread. E.g. *lets do like a chain story. i could start it, and then someone could say the next bit, and then someone else does the next bit after that, so on and so forth.*	2.4%
	School and peer evaluation chat	Talking about their school lives and their worries from school E.g. *hi im in year 10 and i have too much english coursework whether its henry vii or seamus heaney and behing on all of it and now the teachers are pushing me for course work. wot shud i do*	8.6%
	Social chat	Talking about personal attitude and experience, want to involve in social interactions with other people in the board E.g. *I really love english- especially english lit! my friends all take the mick but i really love it!! lol!! they dont take the mick though when they need me to annotate their anthology with them!! lol!! anyone else love english or am i just the only geek!!!*	11.7%

- Learning Discussion

Nearly half of threads were in search of help with specific topics. Because English school lessons and homework are normally centred on a topic, users can easily identify which topic they need help with. But in order to get useful help on the topic, they need valuable discussions around the topics from both sides: help seeker and help provider. Disappointingly, 62.5% of threads in specific help category did not get any reply.

Even though there are only 15 discussion threads discussing about English literature ranged from Romeo and Juliet to Harry Potter, 14 out of 15 threads (93.3%) attracted a replied. This category was the most replied. But the discussion in this category is more about comprehension of the literature and Harry Potter is a more favourable topic: it attracted more than 100 replies in one thread than Shakespeare's classics which normally received no more than 10 replies.

- Chat-style Discussion

Chat-style discussions on students' school learning experience and exam relevant experience and strategies also occupied one third of discussions in the board. Exam time tension was not as frequently mentioned on the English board as on the Maths board. And in the social chat, users expressed more affection towards English. They even played chain story games on the board. It seemed that even in terms of the online discussions, English is a more suitable subject than Maths for stimulating discussions (amongst a constituency of students who were taking both subjects in national exams at that time).

General Discussion

Shared phenomena emerged across different subject boards

Referring the quantitative analysis of the 'traffic' on the Maths board and the English board, we found that the threads on the English board were generally longer than the Maths board and the total amount of users' participation on the English board was significantly more than the Maths board. Nonetheless, the quality of the conversations was not improved by the denser participations and discussions.

Firstly, the ratio of active users to the totality of users on each board is not significantly different. This indicated that the rise in participation did not make an impact on the return of users. Secondly, because the discussions in the chat style category on the English board are nearly three times that of chat style discussions on the Maths board, this led to more participation on the English board during the fixed period of time. Based on these two observations, we might argue that although there was more discussion and participation on the English board than the Maths board, the shared phenomena emerged across the two boards are that the amount of learning discussions were limited and social emotional exchanges were prevailing, no matter how dense the discussion and participation could be.

Different subject discussions animate the boards differently

BBC ONION Street message boards are topic-centred. According to data analysis of the Maths board and the English board separately, different thread structures were identified. Maths discussion threads normally emphasised procedure and accuracy in replies. Users on the Maths board were likely to post a question from their homework. They needed instant, agreed and reliable replies. Also, maths discussions, especially on algebra, required text format editing and better visual representations. These functions were not included in Onion Street. But, English discussion threads required clear references to each contribution, because the child users normally talk about their personal experiences or opinions on a topic. Therefore, although the children can transplant their communication skills from spoken English to online text-messaging, different characteristics of academic subjects still should be considered when communication media is designed for children's learning.

Self-initiative users compromise with the regulation of the board

BBC ONION Street message boards provided a free, high profile, accessible and public space for all the UK children. Children's authentic experience with text-based asynchronous communication media occurred during their out-of-school leisure time. They joined discussions on their own initiatives. Their aims when joining the boards were revealed through their messages. But more than 90% of user identities never came back in three months. Therefore work needs to be done if this is to be turned into a truly engaging resource for young learners to return to. More than half of discussion threads fall into general help (Maths), topic help (Maths) and chat-style (English) categories and more than one third of threads mentioned the exam time tension. This reveals that child users are not really skilful at proposing their needs and asking questions. They are not clear about what they can expect from the people they are talking to. Moreover, the pre-moderation process delayed the development of the whole board discussion. As competent users of mobile phones and commercial text chat system which are supporting instant replies, the Onion Street users may easily lose their patience in trying to follow the discussions by waiting one or two days. With those constraints, the users finally compromised with the regulation of the board. They posted more social messages to release their stress and personal concerns, but fewer learning messages which required more effort to gain valuable feedback. They rarely posted new threads and finally became inactive users.

Conclusion

In this paper, we have investigated children's authentic uses of message boards in an out-of-school learning context. We identified that the quantity of discussion and participation did not have a direct impact on the learning quality of discussions, although a message board needs to survive by sustaining its considerable amount of participation. As self-initiative users nested in a technology rich home, children's perception of a message board constrained its learning value. However, sharing emotional reactions to study and examination may still have made the resource a useful one. Therefore, in order to improve the learning value of message board to children, we need to subtly consider different subjects individually. In the Maths discussions, agreed and reliable replies should be highlighted. However, in the English discussions, clear references to the authors, bookmarks and classification of individual's scattered contribution should be provided. Furthermore, to sustain children's long-term participation, we need to provide emotional support to children's learning and encourage them to create emotional bonds on the message boards.

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