

Virtual.Cultural.Collaboration – Mobile Phones, Video Technology, and Cross-Cultural Learning

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ABSTRACT

Cross-cultural learning has gained increased interest and importance within school curricula in recent years. Schools are using technology to accumulate resources for cross-cultural learning, which has predominantly been pre-prepared videos, documentaries, photos and textual information available online. In this paper we describe the engagement with video technology on mobile smartphones by three migrant families who were tasked with developing cross-cultural resources over the course of six weeks. The resources developed were then used as a learning resource in a classroom and feedback was taken from the teacher. Our study has established that mobile phones particularly smartphones are an accessible, evocative and affordable avenue to aid in the development of cross-cultural resources alongside building stronger parental engagement in schools. The study contributes an expansion of knowledge in research areas that seek to use video technology on mobile phones to build cross-cultural resources for learning and strengthen home-school and school-home communication.

Author Keywords

Cross-cultural; learning; mediator; education; community collaboration; video technology

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

In recent years there has been an increased voluntary and involuntary movement of people around the globe. Many countries now boast of culturally diverse societies where equality and diversity topics form key components of curricula in schools [9][23]. Often termed under cross-cultural learning/multi-cultural learning, they are frequently delivered through cross-curricular approaches in schools.

Close at hand is the increasing presence of technology inside classrooms [41][32] signifying its prominence within the core curriculum. This combination of factors poses important and unanswered questions. What happens when schools have to use technology for non-core subjects such as cross-cultural learning? How do schools go about creating and curating resources for non-statutory subjects?

Schools currently use several ad-hoc approaches to gather resources for cross-cultural learning. Reaching out to children from diverse cultural groups is one approach, where teachers and students are encouraged to bring artefacts and discuss experiences that are then shared with the wider class [11]. Schools also make efforts to reach out to diverse cultural communities living in a locality and use their knowledge as a resource. Whilst linking communities to the classroom has positive effects for both the school and the local community [40][24], schools find that such activities create additional workload as they often have to resource the project and keep it going.

Mounting demands to cater to statutory requirements means that such resource dependent non-statutory activities have a very short life span in schools. There is a risk of schools moving away from engaging in non-statutory activities if they are unable to identify enabling conditions, such as active and on-going support from community groups. Community collaboration provides children enrichment [18] and enables them to make meaning from learning about the world around them.

Teachers are constantly exploring avenues to engender discussion relating to cross-cultural learning and digital technology is one such avenue. Teachers often accumulate pre-prepared videos and documentaries relating to specific topics about cross-cultural learning from online resources and incorporate them within their learning plan. Videos have found favour within teaching practice as they provide a narrative medium to engage the learner by evoking empathy and offering an understanding of events that is perhaps not possible through print materials or photographs [25]. Whilst this is encouraging, teachers also need to be mindful of drawbacks associated with integrating pre-prepared videos within their teaching plan. The way that videos are produced and used within classroom environments can greatly affect their efficacy [16] with teachers running the risk of alienating the student if the



videos fail to engage the learners. Research has identified that technology-enriched classrooms support in developing students' higher level thinking skills [14] where technology is seen to support not just knowledge gain but also knowledge application. Teachers have been reported to prefer constructivist approach to active learning and hands-on experimentation [7][36] particularly that of communal constructivism [37][19], where students not only construct and develop their own knowledge by collaborating with their environment but are also actively engaged in creating knowledge for their extended learning community (social constructivism).

Mobile devices are recognized to support constructivist ways of learning [1][13] and offer advantages such as mobility, portability and accessibility and can comfortably traverse the boundaries of formal and informal learning spaces (schools and homes). Their high penetration and acceptance amongst young people [22] provides a fertile ground to exploit their potential within learning environments. This research is thus an attempt to find out how video *technology* on mobile smartphones can

- Support the process of creating rich and authentic cultural *resources* for learning.
- Support cross-cultural *learning*.
- Create new avenues for meaningful home-school and school-home *communication*.

We present a case study in which we worked with three migrant families whom we asked to use two different video technologies on their smartphones to produce content for cross-cultural learning in schools. We used the existing video application (built-in application) present on the participants' phones to ensure familiarity with the application. We then introduced a new application designed to help scaffold new learning partnerships and address our goal of enriching communication between school and home. We also presented the content developed by the families to schools to understand the impact of such resources in a classroom environment.

RELATED WORK

There is a growing body of work looking at the importance of cross-cultural learning within school environments. Sleeter [35] reviewed 80 published studies of various pre-service teacher education strategies including cross-cultural immersion experiences, where the students of teacher-education actually live within culturally diverse communities while they are learning to teach. Sleeter mentions that community-based immersion programmes have a powerful influence particularly on White teachers who find community based experiences more important than the formal training programs but without providing any evidence on their impact. Moreover this report predominantly focussed on the trainee teacher and did not investigate the experiences of the teacher while they continued to establish their role in a classroom environment.

Similarly notions of funds of knowledge [27] were explored by teachers in schools from Tucson, Arizona who were engaged with Mexican communities. They defined funds of knowledge as 'historically accumulated and culturally developed bodies of knowledge and skills' that are deemed essential for household or individual functioning and well-being which when tapped into can help develop novel classroom practices. A key aspect of this research was the use of teachers as co-researchers, where visits to family households helped establish more symmetrical relationships with parents. However reliance on teachers and researchers conducting home visits to understand cultural knowledge is unsustainable in a context where schools are resource-constrained.

Olmstead et al. [30] examined the role of digital technologies on student achievement and parental engagement. Participants comprised of parents from diverse cultural backgrounds and data were collected through surveys and semi-structured interviews. The study acknowledges that digital technologies can support parental participation and advocates proactive involvement from parents such as helping children finish their schoolwork at home and staying informed about student progress. Furthermore Turner [38] raises a valid point that parents' cultural background has role to play in adopting digital technology for parental engagement. The use of technology in their study aimed to understand the child's progress and attainment as opposed to feeding into the learning needs of the child, reinforcing the notion that learning only happens at school and home is a place to complete school activities. Lewin and Luckin [20] share the opinion that technologies that are readily available, that are simpler, and less resource hungry can provide opportunities to deepen parental engagement in schools.

Education providers are increasingly seeking to bridge the gap between home and school learning, and there is a growing amount of research in the HCI community within this area [6][15][10]. Cheng et al. [6] looked at computer-based learning environments to bridge in-school and out-of-school learning. Chat interactions of sixth grade students regarding their assignments and general activities both at home and in school were analysed. Researchers identified that there was a greater number of relevant lines of text per interaction when students were out of school. Iivari et al. [15] looked at children's technology use in their everyday practices by employing video technology. Eleven year old children who kept video diaries for four days to describe their daily activities related to technology use. There were various challenges such as the length and number of video clips becoming burdensome for children, the misunderstanding of instructions, the provision of superficial answers, distance and mode of communication all of which affected the data gathered. Moreover the task set in both of these studies resembled a school assignment, which made the students less engaged affecting the richness of the data.

Fraser et al. [10] interviewed three families to understand their attitudes to a number of ubiquitous computing technologies which support home-school transitions. Whilst the families acknowledged the educational usefulness of the technologies, privacy concerns made them reluctant to share information even with teachers. The research highlighted that participants were wary of using new technology, as it is often accompanied with a requirement for training, having to invest in new equipment, and perceived as generating issues around privacy and trust. Although the need for high visibility of data travelling outside of the family setting and building trust relationships between teachers and families is touched upon, the means and ways to get there are still unclear

The use of familiar and accessible technology could be one way for families to gain control of information flows from within homes to outside home (e.g. school) environments. The ubiquitous presence of mobile phones provides us with that opportunity particularly in an education setting where students are seen to have access to devices with the necessary hardware and software [12]. Research on the use of mobile phones in an education setting [21][39] has identified several positive effects. Lindquist et al. [21] looked at data collected from undergraduate students on the use of mobile phones to submit assignments. Students expressed concern about text message submission as they found typing cumbersome for lengthy exercises, and submission via photo messages was cost-prohibitive. However the use of videos was completely unexplored, which could have addressed other issues such as brevity that hampered creative expressions in student submissions.

Based on the above discussion, we believe that there is a research gap within areas of collaborative use of smartphones in school-community partnerships. Communities and families have integrated mobile devices in their everyday life and it is only a matter of time before schools will identify their ubiquity and potential and blend them within their dominant learning pedagogies. Bachmair et al. [2] liken knowledge and mobile phones to a cultural resource and mention that the above two are no longer controlled or governed by schools and the use of the two will have an impact on the individual's participation in his/her society.

This paper makes two contributions. First, we illustrate how children and families can document diverse cultural experiences outside of schools through the use of mobile phone-based video technology. Second, we demonstrate how this documentation can become part of school curricula as a cross-cultural learning resource.

RESEARCH CONTEXT

Key Stakeholders

Families and Children from ethnic minority background

Families are often the first source of contact when schools engage in cross-cultural learning. Current initiatives in

areas of cross-cultural learning are often rendered unsustainable for reasons such as ad hoc approaches in engaging communities within curricular learning. There is a need for a third space [26], a place that could be conceptual or physical to support 'cultural, social or epistemological change by bringing different 'funds of knowledge' [27] to converse with each other. We believe technology could provide a third space for teachers, parents and children to come together to share their expertise, address gaps, and support each other's life-long learning journeys.

Educators from local schools

Bridging between the homes of ethnic minorities and schools can address issues of deficit thinking [34], which deals with notions that students who are culturally different are often viewed as culturally deprived and disadvantaged, to acknowledge the 'richness' that migrant children bring with them into the classroom through their 'funds of knowledge' [27]. Educators are key within this research as they are able to understand existing challenges while preparing and teaching for the topics relating to cross-cultural learning within a classroom environment. Cultural artefacts, practices and rituals all add meaning to the life of the child [27] and recognizing it within the classroom environment reduces insularity of classrooms as well as feeding into lessons and academic content.

Participants

We undertook an opportunistic sampling approach [29] to recruit participants for the research. A total of four families (*F1, F2, F3, F4*), all of south Asian origin, and four schools (*S1, S2, S3, S4*) volunteered to take part in the research. Schools were nominated by the families, which were invariably the ones where the child from the family attended. *F4* dropped out from the research citing personal commitments but their corresponding school *S4* agreed to stay in the study.

F1 consisted of a stay-at-home mother, educated to degree level and a working father employed within the arts sector, educated to a post-graduate level. They have two young children, a boy and a girl. The girl who was the older child attended primary school and was considered as a participant for the purpose of this study.

F2 consisted of both parents educated to degree level. The mother was a stay-at-home mum and the father worked within the IT sector. They have two boys. The older child attending middle school was considered as a participant for the purpose of this study.

F3 consisted of both parents educated to a post-graduate level with the mother qualified as a medical professional and father as a qualified accounting professional. They have one boy. The boy was attending a primary school and was considered as a participant for the purpose of this study.

STUDY DESIGN

The research was explored through a case-study approach, conducted over a two-month period. The first meeting was

planned as an interaction workshop where the families met to discuss and develop a shared notion of what constitutes culture and cultural instances, and how these might be shared with the wider community. Subsequently each family was encouraged to use their mobile phones and record cultural instances. The recording of videos was divided in two phases: the first phase looked at the use of built-in video technology on their mobile phones and the second phase looked at the use of Bootlegger [33], a web-based video application that allows groups of people to work together to create their own video documentary. Bootlegger is designed with a web application front and a mobile application front as seen in the figures (Fig. 1a, 1b, 2a & 2b). The web application allows individuals or groups to design a shoot, also known as ‘commissioning’, which includes information regarding what type of videos the creators are seeking to collect. Through the web application one is also able to view all the videos that are collected and shared by the participants of a particular project and edit them easily. The mobile application provides a scaffold for the users to help them in producing a high quality video with instructions and direction through the provision of templates or shots. The mobile application also provides the option for the participants to securely upload their videos to a cloud server once the shoot is complete.

Three key features helped us to decide on the use of this particular application within our research: the commissioning tool (Fig.1a) that provides structure to collaborate between communities and networks and view and edit videos easily (Fig. 1b); the presence of ‘shots’ or templates in the application that gently support and scaffold the shooting process (Fig. 2a & 2b); and the ‘upload after record’ option that ensures information sharing is treated as something that is easy & safe alongside to reassure the participants that the videos can be uploaded to a central location without encroaching their local memory space on their smartphone.

The researcher requested that families introduce the project to their schools following which the researcher took initiatives to coordinate future meetings with school head teachers/class teachers. The school meetings were focused around three main questions: (i) How do parents from ethnic minority families share cultural instances that take place within homes to schools for the purpose of learning? (ii) How do schools use digital technology to create and curate resources for cross-cultural learning? (iii) What is the impact of such resources on educators within a school setting?

This research used a range of different approaches for gathering qualitative data including field notes, observations and semi-structured interviews.

In the first phase, participants used the built-in video application present on their mobile device to record and share videos. Participants were required to shoot short videos (between 1-2 mins) of cultural instances as they

unfolded in their everyday life. The time limit was identified following our conversation with teachers who mentioned that short videos lasting less than three minutes engage children in learning when they are in the classroom.

Families shared the videos with the researcher through mobile messaging service or through an email. A meeting was organized with the whole family to discuss and develop a film using the videos prior to showing it to their respective schools. Participants led the editing process, directing the researcher on what videos to use and what to leave out. The editing process generated a lot of discussions between the family members. The final film was then taken to the schools and shown to the head teacher/class teacher to gain their feedback on the video and the activity of using such videos as resources for cross-cultural learning.

In the second phase participants were required to use a video application called Bootlegger[33] to collect and share videos. The protocol for this phase was similar to that in the first phase. The researcher organized a final meeting to edit the videos collected, create a film and share experience as a community. Only the children were able to attend this final meeting. The children shared their experiences using technology and their experiences of cultural learning in this study. The researcher organized a separate meeting with the parents to gain their feedback on the use of videos and the use of Bootlegger for recording cultural instances.

At the time of study, Bootlegger [33] was available only on Android smartphones. Participants were required to download this to their phones and were required to use it in the second phase. Two families (*F1* & *F2*) used Android devices whilst the third (*F3*) family used iPhones. We provided *F3* with an Android phone for the second phase of the research

The researcher organized 20 personal meetings with each of the participating families and a total of 10 meetings with all the participating schools. There were further unscheduled meetings that were organized at the request of the participants particularly in the second phase when families were using Bootlegger on their mobile phones.

Data Analysis

The qualitative dataset consisting of interviews with the families and educators were analysed using Braun and Clarke’s thematic analysis [3].

In presenting the data, the direct quotes from some participants have been translated from Indian vernacular languages into English as participants chose to move between their home language and English during interviews.

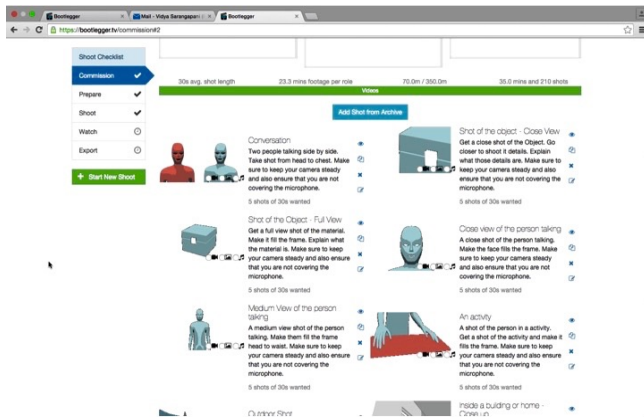


Fig. 1a – The commission tool on the web application where one can provide instructions on what type of videos are required from the shoot.

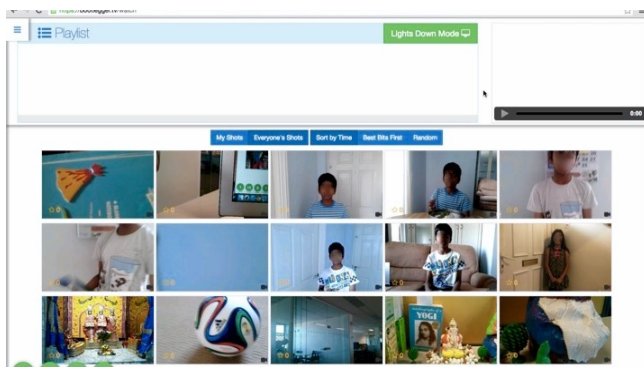


Fig. 1b – Videos are stored centrally and can be accessed on a single screen to view the collaborative effort of all the participants. They can also be easily edited to create a movie.

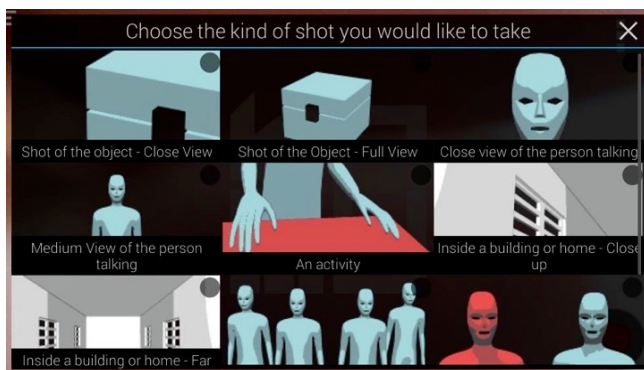


Fig. 2a – The mobile application that provides the templates for users who have subscribed to the shoot.

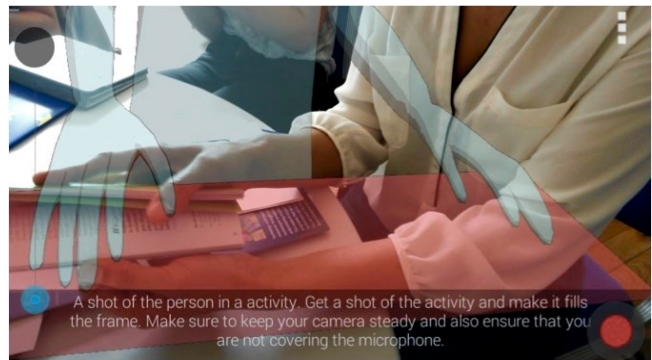


Fig. 2b – More directions to the participant are provided within the template along with a timer to indicate how long the shoot is required to be.

FINDINGS

We had two datasets one from the families and one from the schools. Datasets comprised of audio recordings of interviews, field notes and observations. The researcher transcribed the audio recordings and conducted a thematic analysis separately for each dataset, which are discussed individually below.

Ethnic Minority Families

The qualitative data from the families can be categorized into three overarching themes (i) Home- School Communication; (ii) Video Creation and Sharing; and (iii) Technology, an opportunity and challenge.

Home-School Communications

Relationships between home and school emerged during interviews and often the families spoke more freely when the formal interview was over and voice-recorder was switched off. Parents referred to parent-teacher meetings when talking about parental engagement initiatives undertaken by schools. These meetings were the only two-way communication systems that parents used regularly to take part in the school life of their child. They mentioned the time constraints in these formal meetings and added that it limits their interaction time with the teacher.

F2 (Mother): It (the parent-teacher meeting) is very formal. There are time restrictions and other parents will be waiting. So we cant take our time and discuss (with the teacher).

F3 was aware of PTA (Parent-Teacher Association) and various engagement activities organized by them. They were very appreciative of the activities but were unable to take part due to personal commitments.

F3 (Father): There is also a PTA that is pretty active. So parents are active. A few parents are really active. But I am not as I have to travel a lot on work.

Video Creation and Sharing

Families were initially unsure how to use video technology on mobile phones to explore cultural instances and the

workshop provided a space to discuss and understand cultural instances within homes.

F3 (Mother): Oh, the instances that you mention are so easy, common and occur in our everyday life. I was worried what and how to do it and thought that I needed to identify and enact special scenarios to make it worthy enough for sharing and learning. But what we discussed occur routinely in our life.

Culture was so tightly integrated into the families' daily routines and practices that they were unable to separate it until they were asked about it specifically. This may not be possible in a parent-teacher meeting as such information is considered too subtle and sometimes even low-level to communicate as a cultural learning.

The content creation process involved a process of rehearsal in some cases. Families engaged in rehearsing the scene, writing a script, discussing and preparing storyboards and holding cue sheets while recording videos.

F2 (Child): Yeah we planned and we said to each other what we are going to do and we just recorded it.

F2 (Mother) I would say go and then he would start. At the end I would show the signs, he would stop and I would then stop the video.

F3 (Child): Last two scripts he typed up and I found it hard to read. I had to squint and I didn't want to squint and that's why he had to bring it closer.

F1 (Mother): I told her what to do and what not to do and I recorded accordingly. If mistakes happened, I would delete it and start all over again.

This scripting process creates opportunities to be more explicit and reflective about what to include in the videos between the children and their families.

Moreover, using video technology on mobile phones made it possible for families to take videos in context as the technology was not restricted to any particular location. Participants *F1* and *F3* recorded instances of religious activity in places of worship and discussed challenges in doing the same.

F1 (Child): I could not talk loudly at the temple while recording as there was another event taking place and it was too noisy to hear

After the content creation stage, sharing the video among family members helped in the externalization of cultural practices that were otherwise hidden to other family members.

F3 (Father): Because to be very frank, the instances we recorded don't typically or regularly happen. Like praying. We do believe in god, but we don't pray.

F3 (Child): We do pray. Very rarely. I pray every morning. You didn't know that did you?

F3 (Father): No.

F3 (Child): I pray every morning. I go upstairs look at the Gods for 3 minutes and I come down.

F3 (Father) Oh I didn't know that. Maybe next time I will video that.

The final meeting had all the children view each others' videos on Bootlegger's web interface. This process (among children of the same culture) encouraged members to make sense of the various rituals and practices. The communal viewing encouraged discussions regarding some of the cultural routines, rituals and traditions.

*F3 (Child): The way they described things, they had their own way. Though same things were repeated, they had their own way of saying things. I just said take off your shoes but *F1 (Child)* and *F2 (Child)* had an explanation why.*

*F3 (Child): I didn't exactly know why we eat with our hands. I kept begging my mum to search for it on the internet and *F2 (Child)* has taught me that.*

Whilst the focus was on building resources for cross-cultural viewing, the above quotes demonstrate the value of such resources in developing intra-cultural learning and making meaning of common rituals and practices like removing their shoes when entering home or eating with their meals using their hands.

Technology, an opportunity and challenge

Portable devices and technology meant that families were able to record videos at home, outside the home, and in private and public places. As demonstrated in the previous section, video technology on mobile phones made it possible to take videos of cultural activities in contexts such as places of worship.

However, using video technology on mobile phones also opened discussions on child safety, data privacy and trust factors. Families expressed their concerns on child safety and security when the videos were being shared outside homes.

F3 (Mother): I don't actually know about all this. But I trust you. You do know about all the bad things that are happening with children. So we trust you on this.

The difference between the two video capturing technologies can be viewed in the table below (Fig. 3). The built-in video capturing software was more familiar to use and thus resulted in generating 100% usable videos. The challenge though was in the transfer of the recorded video due to the traditionally large file size of video files.

Bootlegger, on the other hand, handled the upload of the recorded videos directly to the server making the process of file transfer easy, safe and quick. All participants mentioned that they had enjoyed the process of exploring Bootlegger and developing videos through it. However, the software introduced other challenges, including the absence of some

expected functions such as the inability to playback videos directly, the lack of control of what gets uploaded, and some usability and learnability issues. This resulted in only 15 usable videos out of the 22 recorded using Bootlegger.

F1 (Child): It was fun, but it was hard as we had to do some more than once and I didn't have much time for that.

F2 (Child): Bootlegger had extra features like focusing on the object & focusing on the person.

F1 (Child): I still think normal videoing was easier. Because Bootlegger is new and you can't really make long videos. Plus if you are talking and if it stops, you get confused where you stopped and where you didn't.

Activities	Number of videos made by the families		
	Built-in video	Bootlegger	
Religion	1, 7	1, 3	2, 0
Everyday customs	2, 1	4, 3	2, 1
Food	1, 0	1, 0	0, 0
My name means	1, 0	2, 0	1, 0
Games & Play	0, 0	0, 1	1, 1
Art	2, 0	0, 0	0, 0
Clothing	0, 0	1, 0	0, 0
Language	0, 0	1, 0	0, 0
Background and Heritage	0, 0	1, 0	0, 0

Fig. 3 - Features the number of videos captured using built-in video application & bootlegger for a range of activities as chosen by the participants.

Educators

The semi-structured interviews conducted with the educators were analysed and categorized in three overarching themes: (i) School-Home Communication (ii) Learning Opportunities (iii) Resources-Staff, Content, Technology.

School-Home Communication

Head teachers stressed the importance of building meaningful relationships with parents particularly those hailing from minority ethnic communities. Schools encourage parental engagement through a range of avenues and comment that parent-teacher meetings attracted significantly higher proportion of ethnic minority parents into the school. Schools noted that other parental engagement initiatives and activities attracted only responses as opposed to proactive involvement.

S2: I think it's people like Mrs A. I don't know if we do well enough, if we should be better at making sure she's aware of all the opportunities there are of coming into school, and I'm sure- When I was talking to her, I thought, 'No, she doesn't know all of them', but she's being very polite and saying, 'It's fine,'" and I thought, "Well, it's probably not fine, actually," but we need to do better for parents like her who are coming in, not at the start of a year....we need to make sure that they access all the opportunities as well, and know what they are.

Learning Opportunities

Having reviewed the videos made by the families, schools noted that such an activity would definitely fit into their parental engagement initiatives alongside feeding directly into the curricular learning of the child.

A teacher from *S2* used the six-minute video produced by the family *F2* in her class consisting of approximately 30 children. She provided feedback on her experiences of using the video as a resource. Children in her class were asked if they wished to embark on something similar and the majority of them in the class showed an interest in doing so. The teacher noted that all the children in the classroom mentioned that they had learnt something new and meaningful through the short video. This activity was also powerful in exploring notions of identity and belonging. When *F2 (Child)* was asked to elaborate on his notions of where his home is, he provided insights his journey from his country of birth to his current country, which he identified as 'home'.

Schools mentioned that the videos produced in the research are an accessible and engaging learning resource. The teacher and the head teacher both agreed on the positive impression the video left on the whole class.

S2: The video had an enormous impact on the children. F2 (Child) was often considered a quiet child and the rest of the children did not know him beyond what they saw. The video has actually encouraged empathy in our children and they are now able to relate to him better. This has had an impact on F2 (Child) too. We see him more confident and outgoing in the school. This is definitely good resource to work with.

S2: It is interesting to note F2 (Child) appears in the video clips wearing his school uniform. This shows how much the school extends into their lives.

Resources: Staff, Content & Technology

Resources were essential for schools to engage deeply within cross-cultural learning. Schools discussed different resource avenues that impact parental engagement and cross-cultural learning.

Human resource was key when it came to developing learning initiatives. For example *S2* mentioned relying on the subject leader to develop resources for cross-cultural learning. *S3* noted that recommendations from other teachers helped to develop resources for cross-cultural learning. Providing a dedicated member of staff also encouraged ethnic minority engagement. For example the presence of a Parent Support Advisor (PSA) helps minority parents seek support about the education system in England.

The curriculum was another resource: subjects such as R.E. (Religious Education), P.S.H.E subjects (Physical, Social, Health and Emotional), Geography, History and English provided opportunities to explore cross-cultural learning.

Resources for cross-cultural learning were primarily assimilated using technology from websites such as Google, the BBC and the TES. Devices such as desktops, cameras and iPads also featured as commonly used resources for cross-cultural learning. Community resources such as inviting parents from ethnic minority groups to share their knowledge were also frequently used. Accessing external resources like visits to houses of worship also constituted a common mode of engaging in cross-cultural learning.

Schools expressed resource challenges in integrating such videos with their curriculum.

S1: Their whole learning experiences are recorded in photographs and in videos. It doesn't as much higher up the school and that's because of cost. Supplying iPads right through school. We do have school cameras in every class and we do have a bank of cameras for children to use but we have one set and we have 480 pupils. So you see, that's money!

S4: I certainly think as a resource if it was something that staff could go and access to use to get videos and resources, I think the staff would use it. But the staff to actually go and start to make it, as a part of the thing themselves, I just don't think they would do it. I think they wouldn't have the capacity to do it.

Getting families involved in creating resources at home can help to address shortages of all these resources, reducing the workload of the teacher in terms of creating content for lessons and leaving them time to focus effort on coordinating the process which is less time-consuming than content creation. Students will relate better to the content they created as compared to general content from the Internet. The only technology needed from the school is the ability to play the videos, rather than devices with which to capture videos.

DISCUSSION

This study adds to the limited research on the use of mobile technologies for cross-cultural learning in schools. The findings of this study provide data that may be used to create a framework for resource creation through classroom-community collaboration. We discuss our findings to address our research questions as to how video technology on mobile phone can help create resources for cross-cultural learning and strengthen communication between schools and families.

We developed this project by consulting families and parents and by identifying technologies that are already well integrated within family lives. Families and schools provided input on the design of the activities to ensure that there is continuity and relevance to the child's home and school learning. The initial workshop activity was organized to aid in confidence building and to eliminate misinterpretation of the activity. Families then developed short videos (lasting up to 1-2 minutes) around a particular cultural activity. The families were aware that the videos

produced could be used as a learning resource in schools. We also ensured that the activity did not resemble a school assignment as this could hamper creativity and the richness of the data and we welcomed new ideas to complete the task. All of these factors enabled families to provide rich data through their videos. We took some of these resources and showed them to the head teachers and class teachers who provided encouraging feedback and identified that working together with ethnic minority families to support curricular resources will strengthen parental engagement initiatives with the resources forming valuable learning materials.

Mobile Technology

The ubiquity, portability and accessibility of mobile phones lent themselves to being easily assimilated within the study and garner buy-in from the participants. This also led to the adoption of a new video technology (Bootlegger) with minimal resistance. The use of personal devices encouraged families to explore personal, communal and social places for learning. The use of video technology on mobile phones can be harnessed for curating learning resources in schools. Children are adept in using mobile phones and navigating built-in functionalities with ease. Parents in this study were seen consulting their children to clarify doubts and troubleshoot issues whilst recording videos or using Bootlegger platform. The use of mobile phones may influence power relations between adults and children and can potentially empower the child to build a voice beyond the home environment. The omnipresence of mobile phones meant that families were able to instantly undertake recording when an event was talking place, whether it was routine activity or a special occasion.

There is also very little investment required in hardware and software as families already possess mobile devices with video capture.

Resources

The use of mobile devices addresses issues relating to resource scarcity that schools face. Using families to collect and curate cross-cultural resources means that teachers don't have to spend significant time identifying relevant, and authentic resources from online sources. A trusted source such as ethnic minority parents and families who are well known to the school, can alleviate concerns relating to quality of the content with teachers being able to request personalized resources. Families' hands-on input into developing resources will encourage a constructivist approach to learning both at home and in schools thereby keeping learning continuous for the child between home and school.

Learning

Technology provided families with the opportunity to engage in dialectical constructivist approaches [28] to learning. In these contexts learning occurs through the sharing of real-life experiences, with external scaffolding help. The technology and the researcher together acted as

experts to provide the necessary scaffold for parents and children to collaborate and produce videos that impacted their learning during communal viewing. The communal viewing also empowered children to open up discussions, seek inputs from other members and externalize practices that were otherwise hidden to other family members.

Our findings highlight the impact of the videos on both those who created them (the parents and children) and on those who viewed them (students studying in the school). It also highlights that families are motivated to take part in activities to enhance their child's learning. These activities can contribute to cross-cultural learning and intra-cultural learning where children can explore and understand the value and meaning of the rituals, practices and traditions that are at play within their homes.

Children in the study touched on the importance of reciprocity by mentioning that they would like to look into the rituals and customs of their friends. Mutual and meaningful exchange of learning must be encouraged between home and school, teachers and parents, and students from dominant and minority cultures. This context of reciprocity is very important as receiving is important in non-western cultures [31][4] where there is a need to engage in mutual, cooperative exchange. In a context of cross-cultural learning, reciprocity is required to maintain the learning balance between dominant group and ethnic minorities, who otherwise may feel disempowered for sharing and not receiving anything in return. Involving families in curricular learning will encourage parents to look at avenues beyond the parent-teacher meetings to communicate with the teacher and contribute meaningfully to school related activities.

Home-School/School-Home Communication

Parents often cite parent-teacher meetings as the only opportunity for two-way communication to discuss their child's progress. These meetings are often time-constrained, and parents often run short of time to discuss their child's progress with the teacher. During such pressured occasions it is impossible to discuss personal events and activities, and doing so could be considered trivial and time-wasting. Schools and parents must come together to develop cooperation and a shared understanding of how to collect create and curate resources for the purpose of learning within the classroom environment. Cooperation can be explored through the use of video technology on mobile phones to build third spaces [26] where teachers and parents challenge and reshape existing policies and pedagogies to create a holistic learning system.

We identified the role of the researcher as being particularly important in developing new channels for home-school/school-home communication. The researcher in this study initiated links with community members and matched the resources to feed into the school's requirements. The researcher played the role of a broker, facilitator and mediator coordinating links between families and schools,

alongside contributing to knowledge creation and inquiry[17]. Le Dantec [8] mentions that research within community settings requires a collaborator, confidant, and advocate to coordinate resources to address the absence of hierarchy or a single-authority system [5]. We envisage the role of the broker to be crucial for developing long-term meaningful relations between communities and schools

CONCLUSIONS AND FUTURE WORK

Schools are excited about the prospect of involving communities in developing resources. Whilst this is encouraging, we note that our case study was taken with a limited sample of families living in a particular geographic region. Future work aims to expand this research into a school where we will invite a larger and more diverse population of children and families to participate.

Our observations on the use of new technology are relevant to those seeking to collaborate with communities. We are encouraged to develop our own platform, a simplistic application that can be integrated into the existing video application on mobile phones. We envisage this application to have two key features: (i) A task-setting function to recruit participants and contribute to task, (ii) A communal platform where it is possible to collect, curate and share video resources easily and safely.

A point to note is that such activities could disrupt family routines and may invite undue attention to ethnic families and their practices. This is certainly not a deterrent as the participants felt that the benefits outweigh the risks from engaging in such an activity.

Schools are keen to develop meaningful relationship with families but struggle to bring migrant families into the schools to take an active role. There is thus a need to reform the meaning of an 'active role' here. Our work emphasizes the 'active role' that parents play beyond the school environment. We highlight a holistic understanding of the 'active role' as opposed to its current definition that rests on parents' participation in school-initiated events. We would also like to emphasize the role of researcher in this study as a change-agent who was able to establish, coordinate, and broker networks and resources to impact learning within communities. An unanswered question remains regarding the role of the broker once the research is complete. We envisage this could be the technology, teachers, parents or the children themselves.

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at rdm@ncl.ac.uk for further information or access requests.

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