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Mobile learning in resource-constrained environments. A case study of medical education.

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ABSTRACT

Background: The achievement of the millennium development goals may be facilitated by the use of information and communication technology in medical and health education.

Aims: This study intended to explore the use and impact of educational technology in medical education in resource-constrained environments.

Methods: A multiple case study was conducted in two Nepalese teaching hospitals. The data were analysed using activity theory as an analytical basis.

Results: There was little evidence for formal e-learning, but the findings indicate that students and residents adopted mobile technologies, such as mobile phones and small laptops, as cultural tools for surprisingly rich "informal" learning in a very short time. These tools allowed learners to enhance (a) situated learning, by immediately connecting virtual information sources to their situated experiences; (b) cross-contextual learning by documenting situated experiences in the form of images and videos – and re-using the material for later reflection and discussion; and (c) engagement with educational content in social network communities.

Conclusion: By placing the students and residents at the centre of the new learning activities, this development has begun to affect the overall educational system. Leveraging these tools is closely linked to the development of broad media literacy, including awareness of ethical and privacy issues.

Practice Points

- Medical students in the setting of a developing country rapidly adopt mobile internet technology for rich educational practices
- Technologies support (a) situated and (b) cross-contextual learning and (c) educational engagement on social network sites in professional communities
- Technology is predominantly used in "informal" higher education
- By placing the learners at the centre of the new mobile technology mediated activities, this development has begun to affect the overall educational system.

1 Introduction

The potential and role of technology-enhanced learning for under and postgraduate medical education has been thoroughly explored in Western countries, which consider it an equally effective and useful supplement to traditional methods (Cook et al., 2008, Harden, 2006, Wutoh et al., 2004). Increasing attention is paid to the role of mobile learning for educating medical students and health professionals (Irby, 2011, Coulby et al., 2009, Sandars et al., 2007). In "developing countries", even greater expectations are attached to information and communication technology (ICT), particularly with respect to education and health (The World Bank, 2011, Chandrasekhar and Ghosh, 2001). The latter has a pivotal role in the context of the UN millennium development goals, where three out of eight goals are directly related to health (UN website). Inadequately skilled health staff is seen as a typical system constraint that negatively impacts the achievement of these targets (Travis et al., 2004). Technology plays a crucial role in improving the education and practice of health workers in developing countries (Pakenham-Walsh et al., 1997). In these contexts, information and communication technologies (ICT) can enable students and professionals to access up-to-date information and learning materials (Jadoon et al., 2011, Katikireddi, 2004), and these individuals may, in turn, reach a much larger group of "final beneficiaries" (Chandrasekhar and Ghosh, 2001). Currently, the evidence appears to suggest potential rather than achievement. In fact, the use of information technology in developing countries seems to be poorly integrated within formal learning curricula (Kommalage and Gunawardena, 2008). Attempts to harness ICT are troubled by a number of factors, such as a lack of media literacy (Samuel et al., 2004, Khalid, 2009, Ajuwon, 2003) and the lack of an adequate ICT infrastructure (Williams et al., 2010, Chandrasekhar and Ghosh, 2001, Kommalage and Gunawardena, 2008). Little is known about how learners can effectively use technology to support their learning in "resource-limited" settings and how this affects medical education in developing countries.

2 Material and methods

2.1 Theoretical approach and research question

Cultural-historical activity theory allows the analysis of changing systems and the learning associated with them. Accordingly, this approach can be considered appropriate for addressing the questions indicated above. In the field of education, this theory is, *inter alia*, widely used in studies on technology-enhanced learning and ICT use (Nardi, 1996a, Kuutti, 1996, Issroff and Scanlon, 2002, Jonassen and Rohrer-Murphy, 1999, Sharples et al., 2007, Blin and Munro, 2008) and has been applied in medical education (Varpio et al., 2008, Brown, 2010, Wearn et al., 2008). The central construct of the theory is an 'activity' that involves subjects (e.g., medical students) who engage in

actions by using tools (e.g., a stethoscope) to achieve specific objectives (e.g., provide good patient care) (Leont'ev, 1974). Individuals do not act in isolation; they are members of one or more communities (e.g., clinical teams) that are organised by a particular division of labour (e.g., what is done by the student), and their actions are shaped by explicit and tacit rules (e.g., when it is appropriate to use a stethoscope) (Engeström, 1987, Engeström, 2001, Varpio et al., 2008).

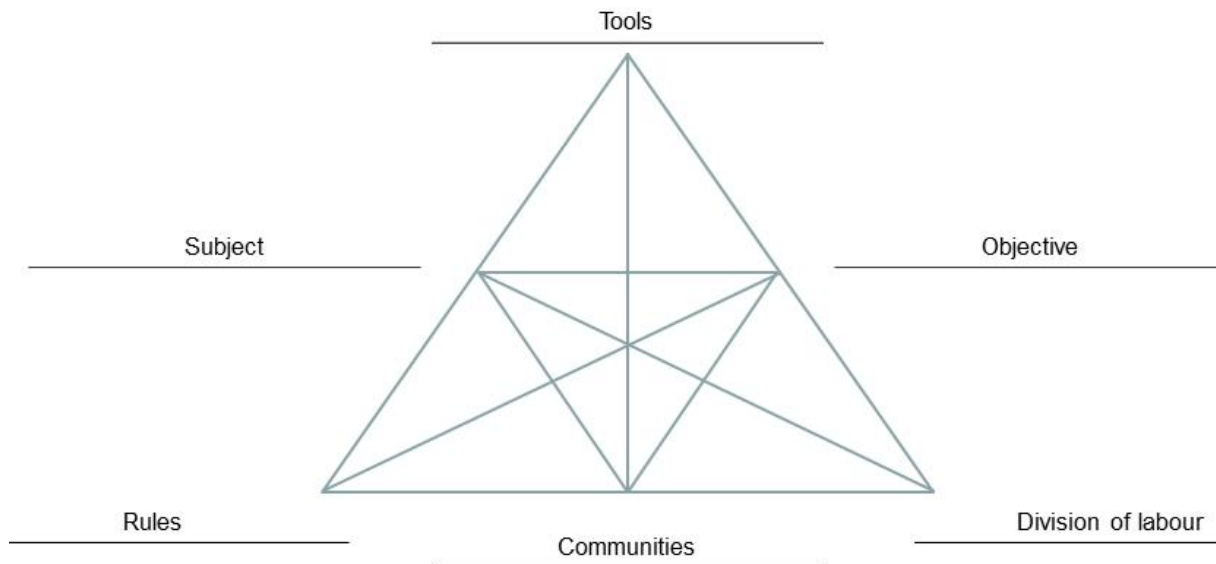


Figure 1 Depiction of an activity system. Adapted from Engeström (1987)

Activity systems (AS) are open and unstable systems in which contradictions (i.e., historically accumulating structural tensions) are sources of conflict that also result in innovative changes in activities and learning. Contradictions can be caused by the adoption of an external element (e.g., a new technology) that collides with existing elements, such as rules and divisions of labour (Engeström, 2001). In view of this theoretical basis and in an attempt to address gaps in the literature, we have identified the following research questions:

- RQ1: To what extent does the adoption of tools (in the form of new ICT) lead to new and adapted learning activities of undergraduate students and residents in resource-constrained environments?
- RQ2: To what extent does the adoption of tools (in the form of new ICT) lead to contradictions and changes of rules, communities and division of labour in the respective activity systems?

2.2 Setting, sampling and data collection

This study was part of a larger research project exploring the role of ICT in the context of medical education in developing countries. The example of Nepalese medical education was used as a case

environment with Hindu and Buddhist roots in one of the world's poorest countries (Human Development Report, 2011). Two researchers interviewed a purposive sample (Patton, 2002) of students, postgraduates, teachers and faculty members from a public and a private university to account for varying perspectives based on age, role and socio-economic and organisational background. Focus groups were chosen as a primary method because they are effective in capturing changes in the context of medical education (Barbour, 2005). In April 2011, after consent was obtained from the institutions, we presented the research process and goals to interested students and teachers at each university and invited them to participate in focus groups. We subsequently conducted eight focus groups of four to eight participants each (n=43), lasting from 57 to 93 minutes (see table 1). Anonymity and confidentiality were ensured. All students agreed to be interviewed before the discussion, and all participants allowed the conversations to be audio-taped. The semi-structured interview guide focused on the use of ICT by undergraduate and postgraduate students for medical learning, working and leisure time use and, more generally, on medical education in the respective cultural contexts. The guide was constructed based on preliminary, Skype-based one-on-one interviews with four students from each university held five months prior to the on-site visit. The discussion of themes that emerged during the focus groups was explicitly encouraged. The focus groups were conducted in English, the working language in Nepalese medical education. The researchers CP and SL alternated as interviewers and observers, making notes during the interviews and site observations.

No	Institution	Degree
01	University A	Undergraduate students
02		Undergraduate students
03		Postgraduate students
04	University B	Undergraduate students
05		Undergraduate students
06		Postgraduate students
07	University A and University B	Teachers/faculty
08	University A and University B	Teachers/faculty

Table 1 Description of sample characteristics

2.3 Data analysis

The interviews were audio-recorded, transcribed verbatim and entered with the field notes into the qualitative data analysis software *NVivo8* (Lewins and Silver, 2009). Data analysis was guided by deductive principles of qualitative content analysis (Mayring, 2004). Taking the adoption of new ICT tools in the form of new and emerging "activities" as a starting point, the other affected elements and the resulting tensions, contradictions and changes in the AS were used as an analytical basis. Two of the researchers, CP and SL, jointly coded 75% of the interviews. The rest of the material was coded by CP. The findings were discussed with all authors until consensus was reached. These discussions and the member checking, in which all participants were invited to comment on the findings (Giacomini and Cook, 2000), were integrated into the final version of the study.

2.4 Ethics

Because no formal framework was available for ethical approval, consideration of ethical issues was provided by an expert outside of the research group who was part of a Swiss ethical review board. In his expert opinion, our work did not contravene the Declaration of Helsinki. However, he identified issues related to *Ethical Legal and Social Issues* (ELSI), such as quotations in which participants reported documenting and re-using patient-related data through private technologies. The expert emphasised that anonymity must be ensured so that no plausible harm to the interviewed groups/participants could arise from the study. He suggested concrete measures to make it impossible even for persons involved in the research project (other than the interviewers) to link any statement to specific individuals or groups. Accordingly, information such as the organisation, group size and dates of the focus groups, which was originally included, was removed from table 1.

3 Results

Due to the similarity in the Activity Systems (AS) of undergraduate and postgraduate students (both groups take exams and work in patient care), we summarise the results of the two systems in the following section. Variations that result from the stronger focus of postgraduates on patient care will be explicitly indicated.

3.1 RQ1: New and adapted tool-mediated activities

In this section, we address the question to what extent the adoption of tools, in the form of new ICT, led to new and adapted learning activities of undergraduate students and residents in resource-constrained environments. In the settings we observed, we found little evidence for systematic and "formal" forms of e-learning and e-teaching, except for the use of electronic presentation slides in the classroom. The analysis yielded, however, three new and emergent learning activities that were based on the rapid adoption of mobile devices, in the form of mobile phones and small laptops,

within a time frame of only three to five years; activities that will be reported in the following three sections. In general, ownership and use of mobile phones and internet was reported to be a very broad and frequent phenomenon:

- *Interviewer: Are there many mobile [phone] users?*
- *Interviewee: Everyone has a mobile.*
- *Interviewer: Do they use it for the internet as well?*
- *Interviewee: Yes. Almost everyone is using it.*

(Focus group 01, the number is cross-referenced with table 1)

Search for ad-hoc information

All students, particularly undergraduates, intensively used their mobile devices to spontaneously search for information. They reported that they tended to look up information ad-hoc, mostly using Google, when they encountered situations in which they did not understand terms or concepts. The interviewees reported accessing information in situ as needed in hospitals to understand a particular case or when they were studying for exams and were unable to find relevant information in their textbooks. In this sense, mobile devices supported learning and sense-making that arose within the immediacy of a situation by linking codified knowledge to situated cognition.

- *I went to the hospital and there was one lady who was diagnosed with [...] and I didn't know what it was. So I looked it up what it was and there was a nice picture. (02)*
- *If we are confused we just take it [mobile phone] and look on the internet. [...] we are in the hospital, walking around. (02)*
- *I use it during my postings when I want to look into a topic when I don't have access to books. When I am in the OP for example I don't have the book so I go to the mobile. And other times when I'm in the library and read the book but need a picture of a certain topic so I look for the topic. (01)*

A few years ago, the only information sources available to students consisted of a limited number of books and teachers. At the time of this study, students reported accessing a variety of additional, current, in-depth sources in a more immediate and "situated" way, which they deemed central to their learning.

Documentation and sharing of images and videos

In clinical environments, many of the undergraduates used their mobiles to take photographs and record videos of special cases, procedures or instruments, such as in the operating theatre or in the dissection room.

- *The teacher would show an instrument and we will be asked about this in the exam so we will take a picture. (04)*
- *[I take pictures] for cases that are difficult to see that's for future purpose and learning purpose. (04)*

This method allowed students to capture their situated experiences in the hospital or lecture halls and carry them to other learning contexts. They re-used the multimedia materials at later points in time for personal study purposes, to prepare for their exams, or to share and discuss their experiences with colleagues in other social and physical contexts.

- *"If we have a photo everyone copies." (01). All of us share it to one another. (06)*
- *Because I can see the same case again and again [...] I will see that again and again. (04)*

While both postgraduate and undergraduate students shared these materials with their colleagues in informal contexts, postgraduates also integrated them into their regular presentations to faculty.

Educational engagement in social network sites

An intriguing finding was the crucial role of the social networking portal Facebook in the life of nearly all interviewed students. Students most often accessed Facebook by means of their mobile phones and used it for both entertainment and other non-academic purposes. However, a reasonable number of students, residents and even some teachers in all of the focus groups also indicated using Facebook for educational purposes, mostly by means of specific sites about medical and clinical topics. These sites were used by a large number of international users, particularly from developing countries.

- *"Medical profession, I love it." That's a [Facebook] group. I'm part of the group.[...] He [the group convenor] asks questions to medical students and gives the correct answers. [...] there are more than 15000 people. (03)*

By participating in these communities, students engaged in different forms of learning and interacting, including discussions of multiple- and single-choice questions and multimedia-enhanced cases. Students indicated that these "*pictures and questions*" (03) were relevant to their learning.

- *It's very beneficial. We can know many things from it. [...] There are so many things we don't know from the textbooks. [...] Even some simple things. While reading Facebook, it's important and you need to remember it. (05)*
- *I get used to the clinical questions and some points to learn. When I miss something in my studies we get that point as well. (05)*

3.2 RQ2: Changes of rules, communities and division of labour

In the following sections, we address the research question how the adoption of tools (in the form of new ICT) led to contradictions and changes of (a) rules/regulations, (b) communities and (c) division of labour in the respective activity systems.

Altered rules, regulations and cultural norms

The data support the view that the adoption of new ICT tools has led to aggravated tensions and contradictions, as well as conflicts with existing elements, such as rules or regulations. This holds true, for example, among students who were criticised by their teachers for their 'copy and paste mentality' and for their non-reflective and uncritical use of internet content.

- *They don't read the textbooks; they search the internet instead. [...] They don't know the basics [...]. Sometimes erroneous things are given. It's not like the textbooks or authentic journals. We tell them not to totally rely on the internet but to first read the textbooks. (07)*
- *They are not using their brain. [...] They just copy paste. They don't know the meaning. (08)*

Tensions were also evident in the form of activities that students attempted to hide and did not perform in front of their teachers:

- *We do it in front of the patients but not in front of the teachers [...]. Most of the teachers don't like using mobiles. [...] It's not a rule but they don't like it. (05)*

In one of the institutions observed, access to social network sites and other "non-educational sites" was banned during lecture time. These kinds of tensions also resulted in rules that changed over time. For example, undergraduates reported that the use of mobile devices was completely banned in their classes: "*We weren't allowed in our times [...] to take pictures or videos*". (05) However, students in the following year of the same focus group indicated that they used their mobiles in all subjects to document relevant artefacts after class: "*While teaching, we are not allowed, but after the class, we can go and take pictures.*" (05)

Changes and extension of communities

The adoption of ICT has led to changing practices within existing communities, such as when students communicated with their peers on social networking sites and extended their offline communities, or when they shared images and videos via their mobiles in ways that were not previously possible. The students explained, for example, how they exchanged multimedia materials in their communities and stressed the importance of these materials for themselves and their friends.

- *[We show the picture] to flat mates. "This is the case I have seen." [...] The whole batch gets it. [...] We proudly show it to the others. (04)*

ICT, in general, and Facebook sites, in particular, also allowed the learners to access new social communities, beyond local borders, that were not linked to existing offline communities. Some of the participants indicated that they participated in international medical groups, and some of them reported using Facebook to prepare themselves for postgraduate career opportunities abroad.

Division of labour: towards learner-centeredness

Contradictions in the AS have also resulted in an "altered division of labour". Although teacher-oriented education (still) characterised formal educational contexts, the learners were at the centre of the new and emerging activities. In contrast to the previously mentioned statements made by teachers about students' uncritical and non-reflective use of ICT, the teachers also acknowledged positive changes with respect to the "division of labour", as indicated in the following statement by a teacher:

- *There has been a dramatic change. We don't have to teach everything now. It's not teacher based learning. It is student based learning. We just tell them and guide them. We give them topics. We tell them to look up and search those topics on the internet and we ask them to verify them from the textbooks. If they find something new and interesting they can ask us. The students are helping us. They are stimulating us to study more. It's a two-way conversation. And the students are also contributing. (08)*

Changes were not restricted to one or more communities within an AS; they also played out across different systems and altered the distribution of knowledge between students, residents and teachers. For example, transformations in the AS of undergraduates impacted the "knowledge gap" between postgraduate and undergraduate students.

- *These days internet is available and even bachelor students are interested. They come with the latest information even before us. (03)*

The use of internet technologies by postgraduates, in turn, has affected the behaviour (or activities in the AS) of teachers and faculty members, as illustrated in the following statement:

- *So it [the teaching] is more based on our own experience and the textbooks that we follow. But the postgraduates have been used to the internet research from the start. The teachers have to follow the same way. There's no way out. (07)*

Mobile phone-based internet access was in particular crucial for students. While teachers and faculty also used their mobiles, they preferred to access the internet by means of their laptops.

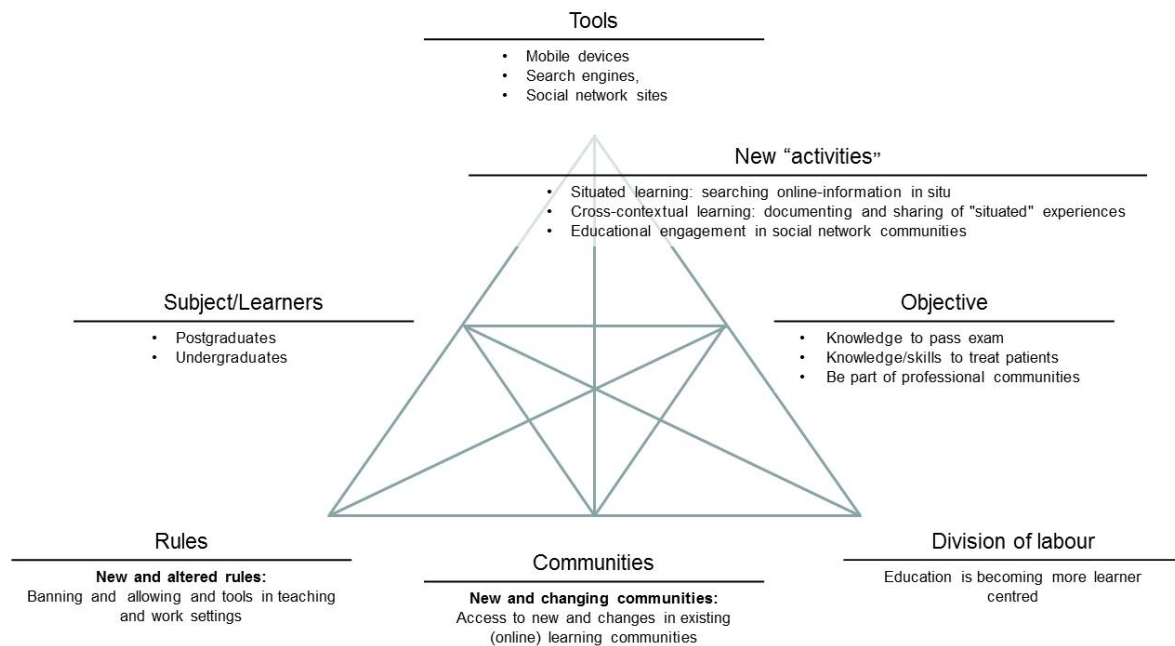


Figure 2 AS regarding the adoption of ICT as tools for learning in medical education in developing countries

4 Discussion

4.1 Situated, cross-contextual learning and educational engagement on social network sites in informal learning contexts

The fact that we found hardly any evidence for "formal" e-learning in the case context is not atypical for (medical) education in developing countries, where the use of such educational practices is troubled by inadequate infrastructure and a lack of media literacy. In this light, it was even more surprising to observe to what extent, at what scale and how quickly learners have adopted electronic mobile devices, such as mobile phones and small laptops, as new cultural tools, and how they have appropriated these devices for educational purposes in informal learning contexts. The research yielded three tool-mediated "activities" (or, as we would prefer, "practices") that enhanced students' situated and cross-contextual learning and professional participation in ways that were not previously possible.

By using mobiles to search for ad-hoc information, students supported the "situated" learning experiences that arose within the immediacy of a given situation, such as during the treatment of patients. In this sense, mobile devices facilitated interaction and sense-making between individuals and their environments in the "*flux of on-going activities*" (Nardi, 1996b). These tools encouraged the students' learning not only in, but also beyond and across individual situations. The ability to capture

audio and video materials enabled learners to document and share their "situated" experiences and enhanced their learning "across multiple contexts" (Sharples et al., 2007), such as lecture halls, hospitals, hostels and homes. In this sense, the tools supported the learners in accumulating (learning) experiences and knowledge across activities, places and times and within and across contexts marked by fluidity, instability and fragmentation (Pachler, 2009), which are typical characteristics of medical and clinical education. However, tool-mediated learning and sharing of experiences were not restricted to local contexts. Facebook, which was mostly accessed by means of mobile devices, allowed students to participate in professional communities that ranged far beyond regional borders. Students engaged with educational content within a community of practitioners that included medical students and professionals across developing countries.

4.2 Transformation arising from informal, learner-centred contexts

Notably, learners are at the centre of the new and emerging activities. The identified tool-mediated activities were most frequently applied in personal, informal learning contexts. These activities also affected formal learning environments through, for example, the documentation of multimedia material in lecture halls. Similarly, we have shown that transformation spread beyond single AS to mutually influence the AS of students, residents, teachers and faculty. This is consistent with studies from other areas that have reported how students and postgraduates stimulated the learning of medical teachers (Balmer et al., 2008) and caused changes in clinical cultures (Bleakley, 2002). In this sense, the adoption of new tools increased the agency of the learners— "the capacity to deal with, and to impact on socio-cultural structures and established cultural practices" (Pachler et al., 2010a). This is all the more remarkable because in the Nepalese culture teachers have a central role and students rank them much higher in the social hierarchy; for example, they "*have been «trained» not to ask questions*" (Lemone, 2005). Similarly, these findings underline that formal learning environments, such as lecture halls and teachers, are "*no longer the gatekeepers of knowledge and the personal expertise*" (Pachler et al., 2010b).

4.3 Practical considerations

We have shown how medical students in a developing country adopted mobile (internet) technologies for educational purposes in informal learning contexts in the context medical education. This engagement does not necessarily lead to better ways of learning, but it raises a number of questions in relation to what Varpio et al. called "varying levels of competence with each tool" (2008) for AS or what might be considered a broad notion of media literacy, including the access, analysis, evaluation and creation of messages (Livingstone, 2004). Ethical aspects and issues of privacy must be considered when learners share clinical experiences through social network sites or when they create content by recording images and videos in clinical settings. Such issues are by no

means limited to developing countries but are also prevalent in "Western" nations (Wishart, 2009, MacDonald et al., 2010). Taking clinical images with cameras and mobile phones for learning and teaching is considered a non-therapeutic function of clinical photography and is not directly relevant for the patient's health (Berle, 2008). Accordingly, students and medical professionals should be encouraged to obtain explicit, written consent for unidentifiable images (Bhangoo et al., 2005). In view of this widespread and frequent phenomenon, it has been recently called for the integration of a code of ethics for clinical photography in codes of practice. These codes should include methods of acquisition, storage and retrieval and should also take issues of both copyright and the use of (private) mobile phones and video cameras into account (Berle, 2008). When using information from social network sites or from the internet in general, learners should be sensitised to the evaluation of trustworthiness as well as to a critical appraisal of messages (rather than a "copy and paste" mentality). Similarly, students must be supported in their purposeful use of such resources to facilitate their learning rather than becoming distracted. This challenge is not restricted to the contexts observed in this study (Bugeja, 2006). We suggest that the new 'activities' should not be ignored or restricted in formal educational settings (as in the evidence in our case study). As emphasised by Pachler et al. (2010b), these activities must be systematically addressed, acknowledged, and aligned with formal educational contexts. As noted by Cole and Engeström, these questions must be addressed before new and emerging activities are transformed into institutionalised cultural practices with "*radically longer half-lives*" (Cole and Engeström, 1993). Such issues should not be addressed at the level of individual teachers; they must be part of the medical curricula at institutional and national levels.

4.4 Limitations and further research

Although we have been unable to discuss new and emerging tool-mediated practices in great detail, we were able to identify and critically discuss pivotal developments and aspects of their systemic implications in the context of medical education in developing countries. We invited interested students to participate in the focus groups. This sampling strategy might have led to bias in the data. Our research was also limited by a single period of data collection and a focus on a single cultural setting. However, there are indications in the literature that ICT supports the transformation of health systems in other geographic and cultural areas (Abdul et al., 2011). Cultural historical activity theory has served as an appropriate starting point for the focus of this analysis, but a much wider range of theoretical concepts is necessary to explain the phenomena at hand. Accordingly, we propose that further research should a) expand the geographical and cultural scope (exploration of other states or continents, such as Latin America; b) increase the methodological breadth and depth (quantitative surveys to reach more participants and participatory observations and ethnological

approaches to produce more detailed analyses of the activities); c) theoretically triangulate the findings (e.g., by using theories from the field of mobile learning (Pachler et al., 2010a) and informal/non-formal learning (Eraut, 2000) or social network sites (Merchant, 2011) to enhance and broaden the theoretical basis; and d) examine changes over a longer period of time to account for long-term development.

5 Conclusion

We attempted to provide a fresh perspective on the important role of technology in informal learning contexts for medical education in developing countries. We have shown how, in a very short time, students have adopted mobile technologies, such as mobile phones and small laptops, as cultural tools for educational purposes in ways that were not previously possible. Mobile devices allow learners to enhance (a) situated learning and cognition, by immediately connecting virtual information sources to the students' situated experiences; (b) cross-contextual learning, or learning across multiple contexts by documenting and sharing situated experiences in the form of images and videos; and (c) engagement with educational content in social network communities. By placing the students and residents at the centre of the new learning activities, this development has begun to affect the overall system of medical education in the context observed in this study. To better harness this potential, learners should be supported in their critical and reflexive use of these technologies. This is linked to the development of broad media literacy, including the evaluation and creation of content as well as the consideration of ethical and privacy issues.

6 Notes on contributors

At the time of the study CP, SL and UG were members of the learning.lab/Institute for Information Systems at the University of Applied Sciences Northwestern Switzerland. AKJ was Professor of Dermatology at Nepal Medical College, and GB, Prof. emerit. and former Dean of the Medical Faculty of the University of Zürich, contributed as e-learning specialist.

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8 Declaration of Interest

The authors report no declarations of interest.

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10 Appendix: semi-structured interview guide

- University: practices/activities:
 - Could you describe a "normal" day/week during a semester? What are typical activities? (Where do you live? how (often) do you (and your colleagues) go to the classes?)
 - Describe a "normal" lecture at the university. (Teaching methods, student participation)?
 - Are there any differences between you and your colleagues, teachers and patients due to gender, religion, social-caste or any other?
 - If you had three wishes with regard to your university: What would you change? Why?

 - Learning:
 - How do you (and your colleagues) learn?
 - How do you (and your colleagues) prepare for an examination?
 - If you had three wishes with regard to your learning activities: What would you change? Why?

 - Computer use:
 - How do you (and your colleagues) use computers in your daily routines? For what purposes do you use computers?
 - What kind of programs/software do you use?
 - Do you always have access to computers?
 - Do you have wireless access to the internet; for how many hours per day and at which time of the day
 - Do you own a computer?
 - Where do you work with computers? (Home, universities, other places). why/when not? (technical infrastructure)
 - Do you feel competent in using computer and internet?
 - If you had three wishes with regard to your computer use: What would you change? Why?

 - Where do you have your computer skills from?
-

- Did you join computer training?
 - When?
 - How many hours all together?
 - Was this training helpful for your computer skills?
- Docents/Teachers
 - Do you have non-Nepalese teachers?
 - In which disciplines?
- Practical skills:
 - Do you have patient-contacts during your study in the 1., 2., 3. and 4th year?
 - Do Nepalese patients easily allow to be investigated by students? What are particular difficulties?
 - Are there any obstacles from gender, from religion, from social-castes or any other?
- Learning material
 - Do you easily have access to learning material, like books scripts or any print material?
 - Is the material you find in your library useful to students?
 - Would you welcome tools for distant learning? Examples are live-video-transmission of lectures from India or other countries; lectures recorded on DVDs etc.?
 - Would you welcome distant learning tools from the internet?
 - Are you familiar with distant learning tools?
- Language skills
 - Do you (and your colleagues) normally use English learning material?
 - How fit do you think you are in English?
 - If you had one wish with regard to your language skills: What would you change? Why?
- Final comments
 - Have we missed anything important? Do you like to add anything?

