

Medical education in Lao People's Democratic Republic: The challenges students face in accessing learning resources

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Abstract

Aim: To understand the needs and preferences of students at the University of Health Sciences (UHS) in Vientiane, Lao People's Democratic Republic (PDR) in relation to access to educational materials in order to develop a strategy for development of educational resources for students at UHS.

Methods: We conducted a cross-sectional semi-structured survey of 507 students, staff and post-graduate residents from a range of faculties at UHS regarding current learning resources, access to educational aids and online learning. Focus groups of survey participants were conducted for in-depth understanding of desired materials and challenges faced.

Results: There was an overwhelming request by students for greater access to learning resources. The main areas of difficulty include English language capacity, limited local language resources alongside poor internet access and limited competence in navigating its use. Students would prefer learning resources in their own language (Lao); many potential study hours are being consumed by students searching for and translating resources.

Conclusions: Students in Lao PDR describe multiple barriers in accessing appropriate resources for their learning. Scoping current access and needs through this research has enabled us to better plan investment of limited resources for educational material development in Lao PDR, as well as highlight issues which may be applicable to other low resource setting countries.

Keywords: *Medical Education, Student Preferences, University, Learning Resources, Low Resource Setting*

Practice Highlights

- At a time when information has never been more available, students in many non-English speaking countries and low resource settings face a daily challenge of information availability and inequity created by both access to technology and educational materials, which are not limited to Laos.
- For learning resources to be accessible for Lao students they need to be cost effective, language appropriate and device appropriate.
- Equipping teachers, who remain an integral tool in students learning, to face the challenges of learning resource access is vital given they face the same access barriers and must keep both their technical knowledge and teaching skills current.
- Rather than large scale development of new educational resources, there is a role of non-traditional education resource development through blogging, social media and curating of materials, alongside engaging students to empower them to access the materials they need.

I. INTRODUCTION

Lao People's Democratic Republic (Lao PDR or Laos) is a landlocked country bordering Myanmar, Cambodia, China, Thailand and Vietnam and remains classified as a

least developed country (LDC) (United Nations [UN], 2015). The history of the education and healthcare development plays an important role in the current education context for Laos with many different countries

contributing to development of these sectors (Dodd, Hill, Shuey, & Fernandes Antunes, 2009). Many of these stakeholders have ties with the University of Health Sciences (UHS), the sole university in the country responsible for training medical doctors through both bachelor level and post-graduate programs (Akkhavong et al., 2014).

Teachers at the UHS have largely completed medical training in-country. Limited English language capacity presents major difficulties in the ability to access up-to-date teaching resources (Milosavljevic, Vuletic, & Jovkovic, 2015; Pavel, 2014). From a geographical and linguistic perspective, the closest country involved in the Lao medical education system is Thailand, with Thai language having similarities to Lao and students and medical staff exchange occurring with Thai hospitals. Historically, the French colonial history of the country means French language is spoken among older generations and is still being taught in the medical school. More recently the importance of English as an international language has been emphasised (Pavel, 2014). The multiple languages spoken by different partner countries, combined with different approaches to medical issues creates challenges for students and staff at UHS above and beyond developing their medical competencies.

Compounding problems of language is the relative lack of learning resources in Lao language, with most text books available to students written in Thai or English. This reflects a wider paucity of written Lao language books in the general community and poorly developed reading culture which is slowly changing (Duerden, 2017). Even fewer relevant online resources exist in Lao language, meaning staff and students must navigate the vast array of online material without accompanying language capacity to distil or search information effectively. This situation impacts both the student's capacity to learn and the staff's capacity to teach.

Whilst there may be a range of available strategies for addressing these challenges for teaching and learning, with limited resources it is critical to understand what the best and most effective investments in educational resources might be. Yet there is little information available regarding the learning preferences and access to resources of university students in Laos, or more generally in other low resource settings. Previous studies in health science learning have mainly focused on social media use (Pimmer, Linxen, & Gröbriel, 2012), electronic learning (e-learning; Bediang et al., 2013), computer literacy (Bediang et al., 2013; Ranasinghe, Wickramasinghe, Pieris, Karunathilake, & Constantine, 2012) and clinical skills learning (Papanna et al., 2013;

Widyandana, Majoor, & Scherpbier, 2010). However, these studies do not cover a broad range of learning preferences, consider resources used for different content areas, nor consider issues of access more broadly. There were recent requests for e-learning tools in Myanmar (Bjertness et al., 2016). They highlight similar challenges in making appropriate learning and teaching material available in a country which may not have the capacity to meet the large, immediate demand for resources – but without the additional language challenges faced in Laos.

This study is the first to gather information regarding student learning preferences in Laos. We aimed to understand the current access staff and students have to educational resources, in particular online learning material and their learning preferences and needs. This information is paramount in aiding the university in their understanding of student and staff needs, in order to develop a systematic and appropriate strategy for educational resource development at UHS.

II. METHODS

A mixed-methods cross-sectional study of learning preferences and access to educational resources of staff and students at UHS was undertaken between May and November 2015. Research was guided by a phenomenological approach, which aims to examine 'the lived experience' of a person or several people in relation to a concept or phenomenon of interest (Liamputtong, 2009). A cross-sectional survey of staff and students was followed by focus group interviews. These two methods of data collection were designed to be complementary. The use of the surveys, representing views of a larger cross-section of the staff and student population, and focus group interviews, representing more in-depth understanding of the experience, allowed for concurrent triangulation (Castro, Kellison, Boyd, & Kopak, 2010).

The survey, consisting of fifteen questions, was developed by the researchers. The questions were designed with the intent to capture a range of information addressing the aims of the study. Questions related to current learning resources, access to educational aids and online learning and perceived educational resource needs. The survey was initially written in English, and then translated into Lao language for completion by participants. Participants included 183 fourth and sixth year medical students, 105 nursing, 72 dentistry, 64 pharmacy, 5 physiotherapy and 4 medical technology students, along with 53 medical residents and 19 faculty staff. Fifth-year medical students were not available due to external clinical rotation. Staff were included since any strategies to address educational resource availability would need to take into account the access and capacity of staff responsible for teaching.

Surveys were distributed to students in lectures and to faculty staff and medical residents in education meetings in the university and hospital respectively. Researchers explained the study, its anonymity and the voluntary nature of its completion to participants, in Lao language, and consent was implied by completion and return of the survey. Survey results were entered into an EpiData database then analysed using Statistical Package for the Social Sciences (Version 24). Categorical data were described according to the number and percentage of participants in each group. Comparison between groups was performed using chi-square.

Stratified sampling was used for the focus groups, with students volunteering from specific sub-groups after they had completed the survey. One focus group was conducted with each of the main student cohorts - medical, pharmacy, nursing and post-graduate medical. Students were provided with a written plain language statement, a verbal explanation, and opportunity to withdraw, then signed a written consent form.

Focus groups were conducted using an interview guide structured around three main questions - current learning materials and how these are accessed; main barriers to accessing learning material and; the learning material needs. Interviews were conducted in English with translation into Lao. Data were audio recorded and transcribed into written documents. The written Lao content was translated to the English language before analysis. Inductive qualitative content analysis was performed by the primary researcher (AK) to elaborate on the survey findings.

III. RESULTS

507 (61.3% female, 36.7% male) students and staff completed the survey from a total of 800 potential participants (response rate 63.4%). Almost half of the participants were older than 25 years of age (Table 1) and the vast majority (81.5%, 413/507) had been in the workforce before medical school. The majority (52.7%, 267/507) of participants were from provinces outside of the capital (Table 1). The largest student cohort was medical students (36.1%) followed by nursing students (20.7%) (Table 1). Faculty staff made up less than 4% of participants (Table 1) and there were no significant differences in their responses compared to students.

The majority (98.0%) of participants own smart phones, for example 18/19 faculty staff, 178/183 medical students and 97/105 nursing students. Smart phones are participant's main access to the internet, with less access to computers or tablets (Table 2). Over 90% of survey participants (478/507) reported barriers to internet

access, with 56.8% (288/507) not having access to internet in their home and very few having access in their educational institutions (Table 2). One hundred percent of faculty staff reported barriers to internet access compared to 95% of nursing and 93% of medical students. There are many barriers to internet access including cost (62.9%), speed (65.1%), language (41.0%) and a lack of understanding (8.1%), and these were also verified in focus group discussions. Sixteen of the 19 staff members said cost was a barrier compared to 114 of the 183 medical students and 67 of the 105 nursing students. Of the 19 staff members, 3 reported language as a barrier, compared with 69/183 medical students and 34/105 nursing students.

Variable	n (%)
Age	
<25 years	278 (54.8)
25-29 years	105 (20.7)
30-35 years	52 (10.3)
>35 years	49 (9.7)
Not specified	23 (4.5)
Sex	
Female	311 (61.3)
Male	186 (36.7)
Not specified	10 (2.0)
Origin	
City	164 (32.3)
Province	267 (52.7)
Not specified	76 (15.0)
Position	
Medical Students Yr 4+6	183 (36.1)
Nursing Students	105 (20.7)
Dentistry Students	72 (14.2)
Pharmacy Student	64 (12.6)
Medical Residents Yr 1-3	53 (10.5)
Faculty Staff	19 (3.7)
Physiotherapy	5 (1.0)
Medical Technology Student	4 (0.8)
Not specified	2 (0.4)

Table 1. Demographics of 507 study participants

A. Educational Resources

More than half of participants (294/507) access the internet daily for study purposes whereas 20.9% (106/507) access the internet monthly or less. Medical students and residents have a higher percentage of daily internet use (71%) compared with non-medical students (48%, $p < 0.001$) although there was no difference in smartphone ownership or internet at home. Around one third of participants used internet search tools, social media and text books for education daily (Figure 1). The social media applications used included Facebook (85.8%), WhatsApp (69.6%) and Line (42.6%).

	Total n (%)	Medical student n (%)	Nursing students n (%)	Staff n (%)
Technology Ownership				
Smart Phone	497 (98.0)	178 (97.3)	97 (92.4)	18 (94.7)
iPad	61 (12.0)	28 (15.3)	5 (4.8)	2 (10.5)
Tablet	35 (6.9)	16 (8.7)	4 (3.8)	1 (5.3)
Laptop	101 (19.9)	29 (15.8)	14 (13.3)	10 (52.6)
Personal Computer	284 (56.0)	104 (56.8)	43 (41.0)	13 (68.4)
Location of internet access				
Phone	487 (96.1)	175 (95.6)	96 (91.4)	18 (94.7)
Internet Café	96 (18.9)	38 (20.8)	13 (12.4)	4 (21.1)
University	51 (10.1)	15 (8.2)	10 (9.5)	8 (42.1)
Hospital	56 (11.0)	22 (12.0)	8 (7.6)	0 (0)
Barriers to internet access				
Cost	319 (62.9)	114 (62.3)	67 (63.8)	16 (84.2)
Language	208 (41.0)	69 (37.7)	34 (32.4)	3 (15.8)
No Computer	45 (9.1)	8 (4.4)	16 (15.2)	3 (15.8)
Lack of Understanding	41 (8.1)	8 (4.4)	12 (11.4)	0 (0)
Internet Speed	330 (65.1)	113 (61.7)	44 (41.9)	14 (73.7)

Table 2. Technology ownership, internet access and barriers among the study cohort of staff and students at The University of Health Sciences Lao PDR

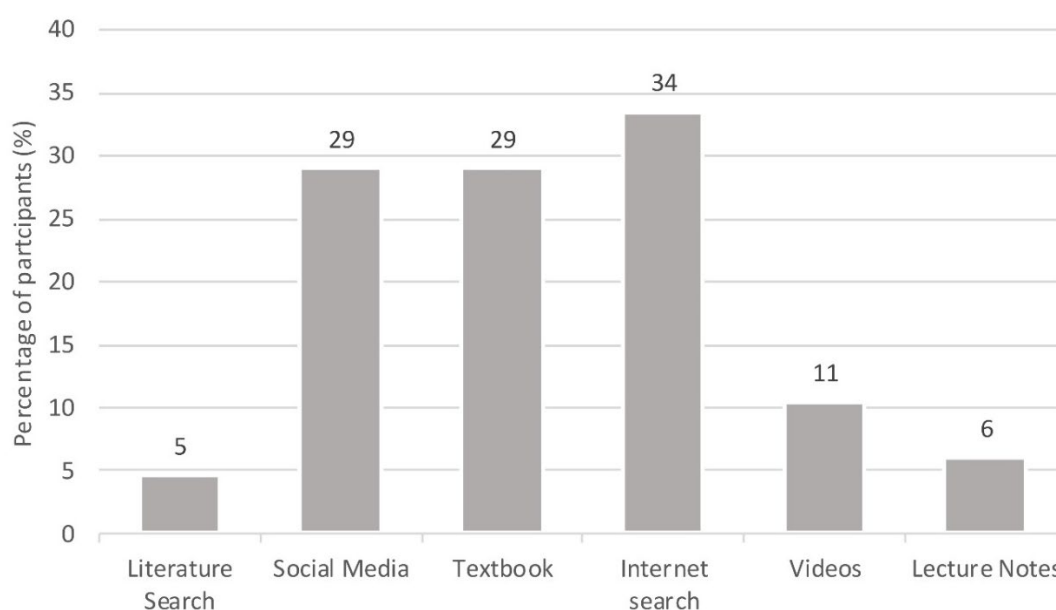


Figure 1. Percentage of students and staff at The University of Health Sciences Lao PDR using specific educational resources on a daily basis

Focus group participants most commonly described accessing learning materials via personal smart phones for internet searches. Internet site searches involved mainly the use of the google search engine and sites such as You-Tube or Wikipedia rather than formal searching for journal articles or other medical resources. Subscriptions for journal article access or peer reviewed medical information sites were scarce with cost again listed as a barrier and also a source of inequity.

“On YouTube we looking for procedures or listening to heart-sound. Sometimes looking for lecture.”

(Medical student)

Social media sites are used to share difficult or interesting cases, pictures or videos. Lecture notes were used frequently, either as handouts of digital presentations or photocopied projector slides, but were generally not available online.

With regard to learning specific skills including procedures, clinical examination and pathology traditional educational resources such as ward teachers and textbooks still dominate other modalities, including online learning (Figure 2). This is despite concerns raised by students in focus groups about the currency of knowledge available through these avenues.

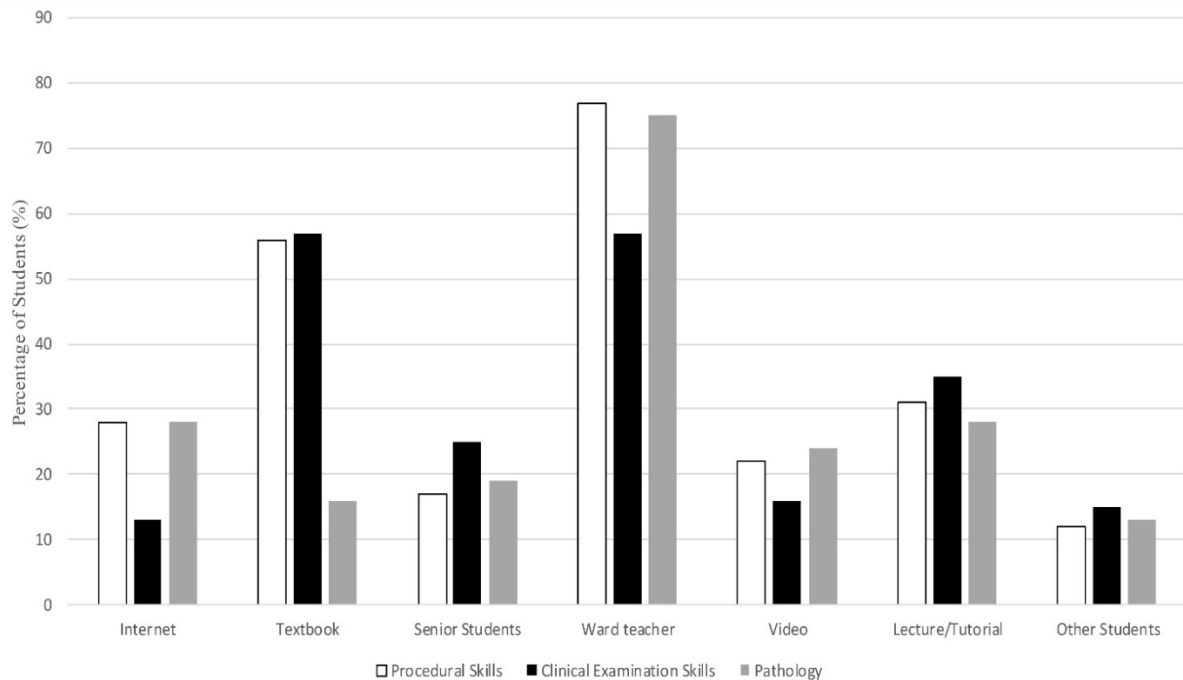


Figure 2. Use of educational resources for learning in specific content areas by students at The University of Health Sciences, Lao PDR

Focus groups described access to only a small number of appropriate books in the university library which were perceived to be “too old”, “not in Lao” and insufficient in number.

“...there is only one copy of the text we need.”

(Nursing student)

Personal ownership of books is limited to those who can afford it. These books are commonly shared between friends and are stated to be predominantly written in Thai language.

Focus groups described their ideal properties of learning materials as easy to access, in the Lao language and up-to-date. Access included availability to all students prior to the relevant lesson, availability on their smart phone despite often limited internet bandwidth, and being available offline when the internet was not available. Lao language books, guidelines and other resources are needed.

B. Language

More than 80% (413/507) of participants stated that all, or the majority, of their learning resources were in Lao language. The staff cohort had an overall lower percentage to this, with 53% (10/19) stating that all or the majority of their resources were in Lao. Very few to no Lao language resources were used by 7.7% (39/507) of participants. Lao was the most popular preference of learning resource language (38%), yet strong preferences

were also described for having the same resource in various combinations of Lao, Thai and English.

Focus groups described the difficulty of finding any Lao language learning materials. Students reported using mostly Thai language resources or English which was then translated through sometimes multiple steps.

“It is so hard to find Lao language. We put English into Google translate to make into Thai and then make this to Lao in our head.”

(Medical resident)

IV. DISCUSSION

Access to appropriate and adequate learning resources is a daily challenge for students and staff at UHS in Lao PDR with an overwhelming need for greater access to learning resources, which are up-to-date, in their local language and available both on and offline. The study highlights the rise of social media as a learning tool even in an environment where there are multiple barriers to internet access. At the same time there is still high use of traditional learning resources, including ward teachers and text books, for specific skills such as physical examination and procedures – even when other media, such as videos, may have potential advantages. Finally, the research illustrates the disadvantage caused by language capacity, in particular the inequity in access to resources due to second language skills with the same problems of access impacting on what staff teach.

Our study population is comparable to both the general Lao population and the UHS student population, with a response rate of over 60%. Most of the survey participants were from provinces outside of the capital city of Vientiane, which is consistent with the general Lao population (UN, 2015). Given the Lao population is relatively young compared to other countries (UN, 2015), it is notable that almost half of the participants were older than 25 years of age and many had worked between completing secondary school and commencing their university degree, demonstrating the financial strains that students must also contend with in order to complete their degrees.

Consistent with previous literature from low-income countries internet speed (Bjertness et al., 2016) and cost (Aboshady et al., 2015; Bjertness et al., 2016) are major challenges. The average internet download speed in Lao PDR is more than five times slower than the speed achieved in Australia (Thompson, Sun, Möller, Sintorn, & Huston, 2016). This is the average, with most students only being able to afford 2g or 3g internet for smartphones and therefore having much slower download speed making smartphone internet access impractical for learning. The cost of the internet for students was reported to be on average one US dollar per day which is a large relative expense compared to the Gross National Income (GNI) in Lao PDR of \$1740 USD/year (The World Bank Group, 2017a). With advances in technology and internet access globally it may be anticipated that there will be improvement in internet access, speed and affordability. Sustainable Development Goal 9.c states an aim to provide universal and affordable access to Internet in the least developed countries by 2020 (United Nations Department of Economic and Social Affairs, 2014). However, countries such as Lao PDR who would benefit significantly from these changes, also often lag behind other countries in how quickly they can access them, or how quickly these solutions become affordable to those who need them.

Not dissimilar to well-resourced countries (Arnbjornsson, 2014; Avcı, Çelikden, Eren, & Aydenizöz, 2015; Cartledge, Miller, & Phillips, 2013; Hollinderbäumer, Hartz, & Uckert, 2013) a large percentage of Lao students use social media applications for study. In a study by Guarino et al. (2014), in a high resource setting, the main reason for use of social media was logistical purposes. Our study population commonly use social media for sharing case-based information raising a clear concern regarding confidentiality in what is an unmonitored social media environment. In addition to this there is difficulty moderating the content or quality of shared information. In a country where access to evidence-based information is challenging, there is a

risk that false information and misconceptions are shared without correction. There is literature supporting the safe use of social networking in medical education (Cartledge et al., 2013; Cheston, Flickinger, & Chisolm, 2013). Whilst there is no existing policy within the Lao University on social media this study highlights the potential need for policy development. A university website or specific faculty or clinical websites could be better forums for sharing case-based information, but due to resource constraints these are presently not viable options. A final alternative is for learning resources to be made available through the social media platforms which are used and through which information is already shared.

Consistent with a previous study (Guarino et al., 2014) participants have stated a higher use of Google and Wikipedia over journal articles or other evidence based medical sites. The reason hypothesised in the study by Guarino et al. (2014) was possible diffidence of students, rather than access, which was commonly cited in our study. Along with ease of free access to Wikipedia, although not explicitly stated, Lao students may find the language accessibility of Thai and some Lao articles another motivating factor to use this site.

The preferred language for any learning resource in this context is understandably Lao. English is now recognised by the UHS as the most important second language for their graduates, and participants in our study recognise the need to access English language learning resources. However, the language competence of most students and staff means Lao resources remain vital, yet few exist. Our study highlights the time students are spending searching for and translating resources from other languages. In a country in which human resource capacity is still being built and the standard of high school and university education remains behind its regional neighbours (The World Bank Group, 2017b) - this is time that cannot afford to be lost. This is a potential source of inequity in medical education globally - whereby countries with the lowest English language literacy often have the greatest need for better educational resources, the least capacity to generate resources in their own language, and the largest gaps in education delivery. Addressing this deficit requires a strategic approach which optimises the impact and reach of any intervention, as well as the use of limited financial and human resources available to develop and translate materials and takes into account technological limitations.

There are multiple different strategies which could be considered to solve the problem of access to learning and teaching resources. One approach option is to translate

desired textbooks into Lao language and have these readily available to students and staff. However, this consumes substantial amount of resources and time and by completion the texts themselves may outdate quickly. Support for faculty to review the quality and currency of lecture material, which could then be made available online, would build capacity of teachers and allow what is taught to be visible. Work is already being done to improve free access to online journal databases and evidence-based medical websites but these efforts are still hampered by difficulties with language or internet access. Alternatively, non-traditional methods such as blogging to create key Lao language resources, lecture materials and provide clear summaries may provide a solution that is more efficient and more easily adaptable over time. Furthermore, inviting the students to collaborate on these materials may empower them to learn, as they are currently disempowered through language barriers and lack of access to educational materials. This would facilitate students with higher English language and computer skills to support their peers. The significant difference in daily internet use between the medical cohort and other groups would need to be taken into account for any resources. The greater daily internet use by medical students compared to other student cohorts did not reflect greater access to Information Technology (IT) or the internet. It may reflect greater IT skills among the medical cohort, or alternatively better understanding of the internet resources they can access, or usefulness of those materials.

Finally, the importance of teachers as facilitators of learning cannot be ignored. Students stated for all practical learning situations that ward teachers are the most used resource over text books and internet. Any e-learning resource created in response to this study must be seen as an adjunct to support teachers; to standardise and optimise the quality of teaching and learning content, facilitate information sharing but not replace teachers. Equipping teachers, who are vital learning resources for students, to face this challenge is paramount as they face the same challenges that students do in accessing information, acquiring second language skills and keeping both their technical knowledge and teaching skills current.

Potential limitations of the study include students feeling obliged to participate or unable to speak openly in focus groups due to involvement of UHS staff in the research team. We attempted to minimise this impact by using both quantitative and qualitative data methods to explore the same issues, ensuring students were given multiple opportunities to opt out of focus groups and keeping the focus group environment informal. Strengths of this

study include the high response rate of participants with a combination of quantitative and qualitative data collected. Focus groups were important for students as they created discussions that enabled students to discuss and compare challenges. They were also a learning opportunity as students heard from each other how they studied and the different resources available.

Despite these limitations our study clearly demonstrates an acute issue of access to local language resources for teaching and learning among staff and students at the sole institution responsible for training doctors in Lao PDR. Whilst Laos may be somewhat unique in its lack of available local language resources, both for the general as well as the medical population -the problem of availability of medical texts or resources in a local tongue exists among other non-English speaking countries (Sabbour, Dewedar, & Kandil, 2010). Many of these countries may also be low resource countries who are reliant on donor funds, and donor priorities to determine what is funded. Solutions such as investment in English language capability of students take time to generate change, rely on changes to the basic education system, detract from time spent on medical content, disadvantage students from lower socio-economic backgrounds and may not lead to better outcomes overall (Dearden, 2014). Furthermore, they create an imbalance when the English language capacity of the teachers may not receive the same investment. Solutions such as the increasing capacity of artificial intelligence to accurately translate online materials may be a more disruptive solution; but will also potentially require new approaches to appropriately integrating materials from diverse sources into curricula.

V. CONCLUSION

Our research highlights the daily challenges and the inequity faced by many non-English speaking countries in this time of exponential availability of information online. English language capacity, minimal local language resources and difficult access to information technology underpinned by the historical context of the Lao education system create enormous barriers for teaching and learning. For learning resources to be accessed sufficiently they need to be cost effective, language appropriate and device accessible. This will not only improve the learning for university students in Lao PDR, but the capacity of their teachers and also their future working selves in continuing professional development.

Notes on Contributors

Dr Annie L. Kilpatrick is a general paediatric trainee who worked as a paediatric clinical education fellow in Lao PDR in 2015 to 2016. She designed and conducted the

surveys and focus groups, retrieved data, performed calculations, interpreted results, conceived and wrote the manuscript.

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Dr Amy Z. Gray is a consultant paediatrician and senior lecturer. She designed and conducted surveys and focus groups, contributed to writing and editing the manuscript.

Ethical Approval

Ethics approval for the project was obtained from the Lao National Health Ethics Committee (2015.76.NIOPH.72.VIE) and The University of Melbourne Ethics Committee (1544310).

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Declaration of Interest

The authors report no declarations of interest.

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