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How Digital Tech Can Help Fix Cambodia's Broken Education and Healthcare Systems

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Abstract

It is widely recognized that education plays the most important role in the social development of a nation and for this reason it has also been described as one of the best elements for nurturing the basic needs for human development and escaping poverty. With the advent of the Fourth Industrial Revolution, new technology solutions and opportunities have emerged, mostly for those countries focused on the development process. The Prime Minister of Cambodia, Hun Sen, aims for year 2050 to be the target date for Cambodia to become a developed country. In order to achieve this target, the first step must be to improve education. The percentage of the Cambodian GDP expenditure in education is still very low compared to other ASEAN countries, and standards for professional development are still partially or completely missing in many sectors. Another fundamental sector for a country is the healthcare system. In fact, education and healthcare are two fundamental variables of any society and Cambodia is still lagging behind in both of them. How can ICT step up and offer solutions for Cambodia? Is there a powerful digital technology solution that could address these problems? Online courses, more specifically, Massive Open Online Courses (MOOCs), have attracted the interest of many higher education institutions and educational firms around the world. Cambodia is approaching this only now, and the Minister of Education, Youth and Sport is urging universities to explore this solution. Improving education starts with teacher preparation. Improving healthcare starts with providing an appropriate preparation to its professionals, too. This paper wants to provide an overview of how MOOCs could benefit Cambodia in practice, in particular by enhancing the professional development of those who are most directly involved in providing education and healthcare.

Introduction

On April 30, 1999, Cambodia became the last member to access the Association of South-east Asian Nations (ASEAN). For the last few years, the country has been experiencing exceptional growth, and this is proven by its Gross Domestic Product (GDP) with an annual increase that has never fallen below 6.9% since 2011. But the history of Cambodia is long and filled with adversities. In 1863, Cambodia's King Norodom, sought help asking France to protect his country from being swallowed up by its powerful neighbors (Thailand and Vietnam). But what started as a protectorate soon developed into a colonial relationship that the king had not foreseen.³ France ruled over Cambodia until the kingdom declared its independence in 1953.

By the late 1960s, however, Cambodia was drawn into the Vietnam War and in 1975, the Communist forces known as the Khmer Rouge overthrew the pro-American regime led by General Lon Nol who had seized power five years earlier and who was supported by the American government. During those years, under the rule of the Khmer Rouge, almost 2 million people died. Not only were Cambodian intellectuals and professionals killed,⁴ but also nearly 80% of the country's university students. The ideology of the Khmer Rouge regarding education is perfectly summarized in a statement of a Khmer Rouge cadre, who said: "Under our system, we don't need to send our young people to school. The farm is our school. The land is our paper. The plough is

our pen. We will write by ploughing".⁵ Cambodia was left with the peculiar scenario of having experienced a decimation of its intellectual elite, leaving a crippling and unprecedented legacy of inadequately trained, or completely untrained, management personnel.⁶

In the '90s, some time after the Khmer Rouge regime and the liberation from the Vietnamese troops, the new administration re-emphasized expansion of the education system within the country, but "again without attention to the educational quality".⁷ Under peace agreements signed in Paris in 1991, Cambodia was placed under the protection of the United Nations until the election of 1993. Since then, Cambodia has been a monarchy ruled by a coalition government. Mainly through garment exports and tourism, Cambodia managed to become the sixth fastest-growing economy in the world between 1995 and 2017.⁸ The poverty rate dropped from 47.8% in 2007 to 13.5% only seven years later.⁹ "Despite these achievements, Cambodia still faces a number of development challenges, including the need for good quality public services, an improved business environment, better land administration, as well as natural resources management, environmental sustainability and good governance".¹⁰ One of the areas that still lags within the country is its education

3 David Chandler, *A History of Cambodia*, 4th Edition, 4th edition (Boulder, Colo.: Routledge, 2007).

4 David M. Ayres, *Anatomy of a Crisis: Education, Development, and the State in Cambodia, 1953-1998* (University of Hawaii Press, 2000), <https://www.jstor.org/stable/j.ctt6wr08t>.

5 Jan B. Y. Berkvens, "Developing Effective Professional Learning in Cambodia" (University of Twente, 2009), https://ris.utwente.nl/ws/portalfiles/portal/6081395/thesis_J_Berkvens.pdf.

6 Evan R. Gottesman, *Cambodia After the Khmer Rouge: Inside the Politics of Nation Building* (New Haven, Conn.; London: Yale University Press, 2004).

7 Berkvens, "Developing Effective Professional Learning in Cambodia."

8 The World Bank, "The World Bank in Cambodia: Overview," Text/HTML, World Bank, 2018, <http://www.worldbank.org/en/country/cambodia/overview>.

9 Ibid.

10 Ibid.

system. Cambodia's education system, in fact, is far behind compared to its ASEAN neighbor countries (Tan, 2007). This situation is explained by multiple factors, but for sure one of them is the preparation of the teachers. In Cambodia the preparation of high school teachers, mainly in the provinces, is very poor (Sem & Hem, 2016) and this is a result of the difficult years that Cambodia had to experience, with the consequence that teachers no longer belong to the intellectual elite and hold little status in the contemporary society (Kalyanpur, 2011). In 2005, primary school (up to grade 6) enrollment was at 92%, but this figure drastically drops when the secondary levels are reached (grades between 7 and 9).¹¹ "Girls become increasingly underrepresented further up in the education system", wrote Berkvens. "The Cambodian teacher pool is characterized by its great differences in the educational level". Berkvens continues writing that "in the early stages after the Khmer Rouge era, it was impossible to assign qualified and well-educated teachers to schools, simply because there were not many left". The new teacher candidates were simply those who had the ability to read and write.

Still, today, even if the situation improved after years of work by the Ministry of Education, Youth and Sport (MoEYS), the problem of educational quality still exists today.¹² As a result, the MoEYS set four education strategy plans from 2000 until 2018:

"First, the education strategic plan for 2000-

2005 focused on enrolment in primary school by 1. starting to cancel enrolment payments; 2. providing school funding using a formula that gave particular support to rural schools in poor areas, and 3. building primary schools across the whole country. Second, the education strategy strategic for 2006–2010 shifted the focus to improving education in secondary schools by 1. building lower secondary schools in all communes and secondary schools in all districts, and 2. giving scholarships to poor students to enable them to complete grade 9. Third, the education strategy strategic for 2009–2013 put a focus on improving internal efficiency by 1. Reducing repetition and drop-out rates; and 2. Strengthening institutions for decentralization. Fourth, the education strategic plan for 2014–2018 focused on 1. equality and the quality of education; 2. the response of education to the needs of the economy; and 3. effective management of MoEYS staff".¹³

It is undeniable that Cambodia has improved in the last decade. The real rapid growth in the country occurred during the period 1998–2007 when the per capita GDP doubled.¹⁴ However, Cambodia is still suffering from many problems and in fact "thirty-five% of Cambodians are still living in poverty, with the rural population making up the majority, according to estimates from the 2018 global Multidimensional Poverty Index (MPI) ".¹⁵ In the country, 13% of women and 6% of men

11 Berkvens, "Developing Effective Professional Learning in Cambodia."

12 Riccardo Corrado, Robert E. Flinn, and Patchanee Tungjan, "Can ICT Help Cambodian Students Become the Solution for Improving Education in the Country?," *Journal of Management, Economics, and Industrial Organization* 3, no. 2 (May 1, 2019): 1–15, <https://doi.org/10.31039/jomeino.2019.3.2.1>.

13 Ren Sem and Kosal Hem, "Education Reform in Cambodia: Progress and Challenges in Basic Education," *Regional Research Paper* (Parliamentary Institute of Cambodia, 2016), https://www.pic.org.kh/images/2017Research/20170523%20Education_Reform_Cambodia_Eng.pdf.

14 Hal Hill and Jayant Menon, "Cambodia: Rapid Growth with Weak Institutions: Cambodia's Rapid Economic Growth," *Asian Economic Policy Review* 8, no. 1 (June 2013): 46–65, <https://doi.org/10.1111/aepr.12003>.

15 Dara Voun, "UNDP Report Finds 35% of Cambodians Still Mired in Poverty," *Text*, Phnom Penh Post, September 26, 2018, <https://www.phnompenhpost.com/national/undp-report-finds-35-cambodians-still-mired-poverty>.

between the ages of 15 and 49 have no education, with four on ten women and a bit more than half of the men have a secondary or higher education.¹⁶ In addition to this, it is still common for girls to marry very soon in Cambodia. The legal age for marriage without parental consent is 18 and the legal age for marriage with parental consent is 16 for both males and females. However, the traditional practice of marrying off children before they are 18 is still widely practiced especially among ethnic groups.¹⁷ "Marrying at a very early age is equated with girls having value and being 'beautiful', 'good' and 'modern'. The community often discriminates against older girls and unmarried women and men tend to view girls over the age of 18 as being too old to marry".¹⁸ Half of the Cambodian women are married by age 18 and the median age at first marriage is around 21 years. Children born to mothers with no education are more than twice as likely to die before their fifth birthday than children born to mothers with secondary or higher education.¹⁹ Furthermore, women need to be empowered through education, employment opportunities, legal literacy, and the right to inheritance.²⁰ In Cambodia, half of the women and slightly more than 25% of men between the ages of 15 and 49 still agree that a husband is justified in beating his wife for at least one of the following reasons: burning food, arguing with him, going out without

informing him, refusing to have sex with him or asking him to use a condom during intercourse.²¹ Nearly everyone agrees that beating a wife is justified in the case of neglecting the children. In this scenario, less than half (43%) of children age 13–18 attend secondary school.²² The effect of providing people with an education does not merely improve their knowledge acquisition, but changes their neurological structure and cognitive skills.²³ During an interview with an illiterate person in Ghana, Professor David Baker asked him if one can get HIV from a blood transfusion. The man's answer was "not if you wear a condom". This shows that the man could not put together a working theory of that disease,²⁴ and how the absence of education can affect a person's way of thinking and understanding of basic concepts. From a study conducted by the Royal University of Phnom Penh (RUPP) in 2016, it was found that there is a correlation in Cambodian students between the probability of dropping out of school and: (1) how much they like going to school, (2) the degree of their educational aspiration and also that of their parents, and (3) the participation in a preschool experience, like kindergarten.²⁵ In addition to this, research revealed that guidance from parents, both in tutoring and counseling, represented important elements for lowering the dropout rate between the young Cambodian.²⁶ The study performed by RUPP

16 NIS - National Institute of Statistics, "Cambodia - 2014 Demographic and Health Survey," 2014, <https://dhsprogram.com/pubs/pdf/sr226/sr226.pdf>.

17 Unicef, "UNICEF Cambodia: Girls Not Brides – Ending Child Marriage in Cambodia," UNICEF Cambodia (blog), March 10, 2017, <http://unicefcambodia.blogspot.com/2017/03/by-chan-kanha-and-ream-rin-romas-is.html>.

18 Ibid.

19 Fatemeh Noughani and Jamileh Mohtashami, "Effect of Education on Prevention of Domestic Violence against Women," *Iranian Journal of Psychiatry* 6, no. 2 (2011): 80–83.

20 Fatemeh Noughani and Jamileh Mohtashami, "Effect of Education on Prevention of Domestic Violence against Women," *Iranian Journal of Psychiatry* 6, no. 2 (2011): 80–83.

21 NIS - National Institute of Statistics, "Cambodia - 2014 Demographic and Health Survey."

22 Ibid.

23 David Baker, *The Education Revolution, and Our Global Future*, Video, TEDx Talks, 2014, <https://www.youtube.com/watch?v=sv3CLr84UJU>.

24 Ibid.

25 Heng Kreng, Soth Sok, and Fata No, "A Case Study of Phnom Penh and Kampong Speu," <http://www.koicacambodia.org>, 2016, <http://www.koicacambodia.org/wp-content/uploads/2016/09/Report-of-School-Dropout-Survey.pdf>.

26 Ibid.

pointed out that “in rural areas [of Cambodia], peer pressure, lack of value for education among parents, low literacy among parents and youth, little job opportunities, and debt due to the repeated marriage of their children all represented as the pullout factors relating to school dropout.”²⁷

In a similar way to the education system, a lack of preparation for professionals in the medical field, together with a lack of resources, is also heavily affecting the healthcare system in the Kingdom.^{28, 29} Cambodia has a “pluralistic health system in which the main health infrastructure and public health care are delivered through the Ministry of Health (MOH), while the disparate private sector provides most outpatient curative care”.³⁰ In Cambodia, the healthcare system (HS) is organized into three different levels, which are central, provincial and operational district.³¹ In order to support a failing healthcare system, a strong preparation, national standards, and continuous professional development are fundamental for professionals operating in the medical field. And MOOCs can represent a very useful tool to support professional development in this field.

Cambodia is on the right path towards improvement but there are still so many problems to address and resolve. Education represents a key factor for moving in the right direction. Improving education starts with teacher preparation, and this is what we are going to discuss in the following sections of this paper.

Teachers in Cambodia: An Overview

It is widely recognized that education plays the most important role in the social development of a nation.³² Sivakumar and Sarvalingam described education as one of the best elements for nurturing the basic needs for human development and to escape from poverty.³³ In Cambodia, the education system is still behind and in fact, a 2010 comparison study between the South East Asia countries, showed that Cambodia spent the equivalent of only 2.6% of its GDP on education, lower than Laos (2.8%), Indonesia (2.8%), Thailand (3.8%) and Vietnam (6.3%) (Figure 1). In 2017, only around 18,000 teachers in Cambodia were found to be university graduates, 51,820 teachers were upper secondary graduates, 19,267 lower secondary school graduates and finally, 1,779 teachers have only attended primary school.³⁴ Furthermore, the average salary for teachers is very low in Cambodia, affecting the motivation of teachers or even the interest in becoming a teacher. In October

27 David Sen, “Medical School Entrance Exam Conditions Change,” *Khmer Times*, October 2, 2017, <https://www.khmertimeskh.com/84031/medical-school-entrance-exam-conditions-change/>.

28 Cristina Maza, “Failing Medical Students Ask Hun Sen for Help,” *National, Phnom Penh Post*, 2016, <https://www.phnompenhpost.com/national/failing-medical-students-ask-hun-sen-help>.

29 David Sen, “Medical School Entrance Exam Conditions Change,” *Khmer Times*, October 2, 2017, <https://www.khmertimeskh.com/84031/medical-school-entrance-exam-conditions-change/>.

30 DPHI, “Health Information System Master Plan,” Master Plan (Phnom Penh, Cambodia: Department of Planning and Health Information (DPHI), 2017), <http://hismohcambodia.org/public/fileupload/carousel/HIS-MasterPlan-Nov2017.pdf>.

31 Ibid.

32 Lay Sovanak and Lim Vouchsieng, “The Challenges of Higher Education for Rural Students in Urban Universities in Cambodia,” *University of Cambodia*, 2018, 13.

33 Dr. M Sivakumar and Chikkaiah Naicker College, “Human Deprivation Index: A Measure of Multidimensional Poverty BY,” *Munich Personal RePec Archive*, 2010, 55.

34 Riccardo Corrado, Robert Flinn, and Patchanee Tungjan, “Can ICT Help Cambodian Students Become the Solution for Improving Education in the Country?,” in *Proceedings of the International Conference on Management, Economics, Business and Social Sciences (ICMEBSS 2018, Phnom Penh: Zaman University, Cambodia, 2018)*, 248.

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2016, the Prime Minister of the Kingdom of Cambodia Dr. Hun Sen announced that the minimum wage for teachers would be increased.³⁵ Thus, all teachers should have more motivation in performing their job to the best of their abilities (Ros 2016). It is undeniable that low salary affects the motivation of teachers and thus the quality of their activity is affected. While pay is not offered as a significant motivating factor for wanting to become a teacher, it would be a mistake

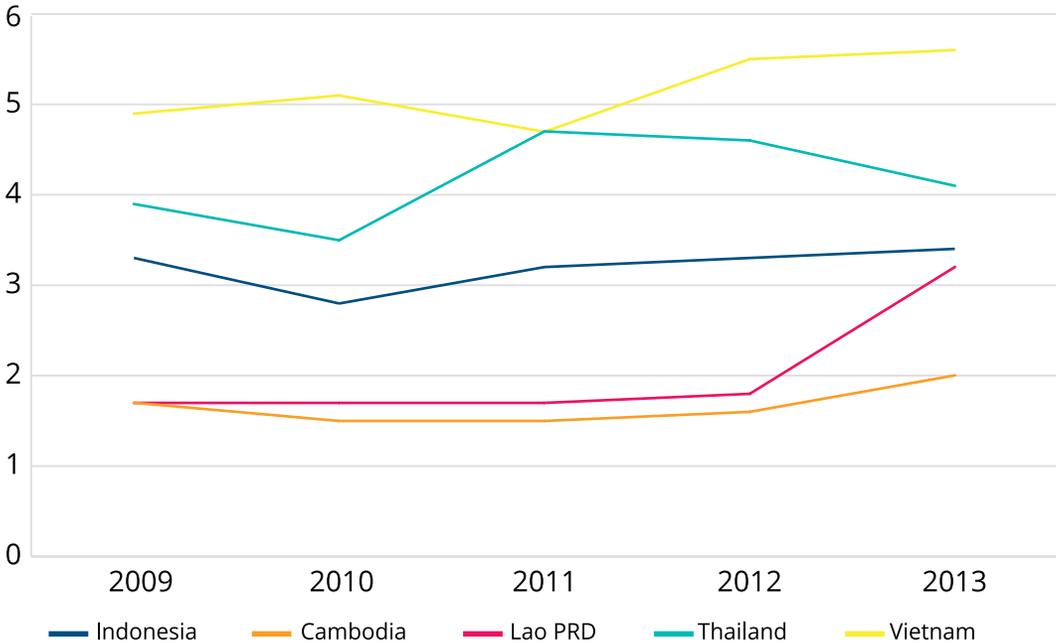


Figure 1: Percent of the GDP Expenditure on Education

to overlook the importance of any regular salary for educators³⁶. As a consequence of the history of inadequate salaries of educators, Cambodia has experienced a spread of informal school fees, which refers to “the payments given by families to some teachers for services ranging from the sale of snacks and bike parking to extra tuition and the return of study records”.³⁷ In 2007 the situation in Cambodia was embarrassing. Teachers earned, on average, between \$30 and \$60 per month, in accordance with qualifications, number of shifts and experience³⁸ and with wages at their current levels, teachers really struggle to survive. On the other side, students, when families could afford it, turned to shadow-education. Even now, qualified teacher scarcity is a core problem, with an average student-teacher ratio of 51:1 in primary school. Thus, placing teachers in remote areas remains a challenge and affects the most disadvantaged students.³⁹ In

³⁵ Sotheary Pech, “Minimum Wage for Teachers to Be \$230 by April,” Khmer Times (blog), October 3, 2016, <https://www.khmertimeskh.com/news/30315/minimum-wage-for-teachers-to-be-230-by-april/>.

³⁶ VSO, “Teaching Matters: A Policy Report on the Morale of Teachers in Cambodia” (VSO, 2008), https://www.vsointernational.org/sites/default/files/valuing_teachers_cambodia__teaching_matters_tcm76-22690.pdf.

³⁷ Ibid.

³⁸ Ibid.

³⁹ Luis Benveniste, Jeffrey Marshall, and M. Caridad Araujo, “Teaching in Cambodia” (Ministry of Education, Youth and Sport Royal Government of Cambodia, 2008), <http://documents.worldbank.org/curated/en/161351468020945260/>

2016 the Education Minister Dr. Hang Chuon Naron confirmed that “for primary school teachers, the monthly salary will increase to at least \$200, and [for] high school teachers, salaries will increase to at least \$250. University teachers will see increases up to \$300 this year, all of which represent minimum wages”.⁴⁰ The situation is improving but it is still not enough.

While analyzing teachers in Malawi, Zambia, and Papua New Guinea, for example, Fry found that teacher’s performance in contributing to learning is strongly influenced by teacher motivation, which is fragile and declining.⁴¹ Furthermore, Fry discovered that even if there is a strong link between teacher motivation and performance and education quality, teacher motivation is a critically ignored factor in education management and policy formulation at all levels.⁴² Policymakers and stakeholders, even if aware of the connection between teacher motivation and quality of the teaching activity and thus, of the learning experience for the students, are not addressing the problem and do not take action in order to meet the needs and requests of the teachers.

“The whole art of teaching is only the art of awakening the natural curiosity of young minds for the purpose of satisfying it afterward”, said the poet Anatole France. But if the teacher is not motivated, the results of his art will lack in quality. Sambonin and Liu

(2017) within the sphere of extrinsic motivation for Cambodian teachers, listed four factors: incentive factors, family support factors, academic support factors, and school environment factors. Incentives are mainly based on remuneration, promotions, and awards. A correct balance between these factors can positively benefit and boost the motivation of teachers. Family support is viewed as the capability of the teacher to support her/his family and at the same time, to support the education of her/his children. This attention to the education of the children is somehow a logical consequence of the role of educators who are teachers-parents. A third important component of the teacher’s motivation lies in the school environment. Sambonin and Liu (2017) list in this category the management and leadership, physical environment, working hours and academic support. The most important element of this last category is professional development (PD). Effective professional development enables educators to develop the knowledge and skills needed to address students’ learning challenges.” To be effective, PD requires thoughtful planning followed by a careful implementation with feedback to ensure it responds to educators’ learning needs.⁴³ “Teacher learning and development is a complex process that brings together a host of different elements and is marked by an equally important set of factors, and teachers continue to be both the subjects and objects of learning and development”.⁴⁴ Unmotivated and unprepared teachers are the problems to be addressed and solved if Cambodia wants to close the gap with the more

pdf/448500WP0Box3210KH0Teachers11Final1.pdf.

- ⁴⁰ Chanveasna Ros, “Public School Salaries Set to Increase,” Khmer Times (blog), January 11, 2016, <https://www.khmertimeskh.com/news/19814/public-school-salaries-set-to-increase/>.
- ⁴¹ VSO, “What Makes Teachers Tick: A Policy Research Report on Teachers’ Motivation in Developing Countries” (London, UK: VSO, 2002), <http://www.bibalex.org/Search4Dev/files/288470/119513.pdf>.
- ⁴² Ibid.

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- ⁴³ Hayes Mizell, *Why Professional Development Matters*, 2010, https://learningforward.org/docs/default-source/pdf/why_pd_matters_web.pdf.
- ⁴⁴ Beatrice Avalos, “Teacher Professional Development in Teaching and Teacher Education over Ten Years,” *Open Journal of Social Sciences* 5, no. 2 (January 1, 2011): 10–20, <https://doi.org/10.1016/j.tate.2010.08.007>.

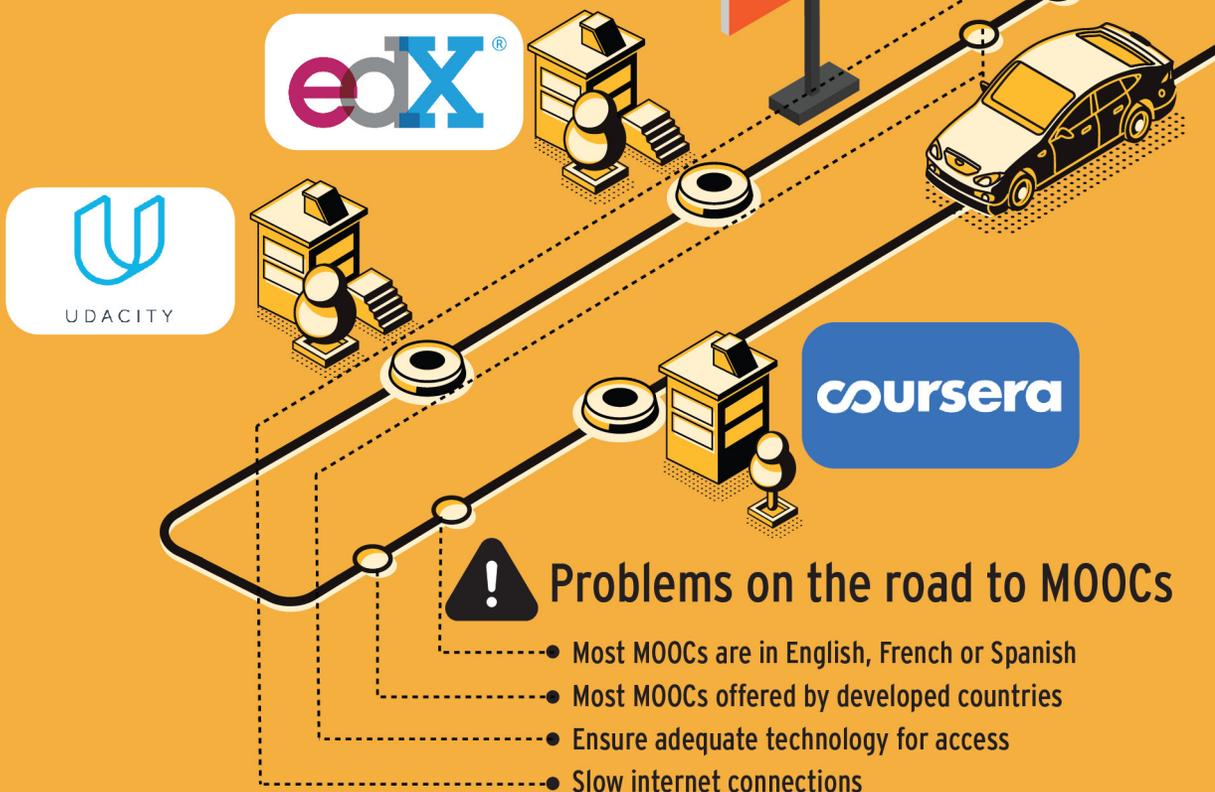
Riding Online Courses Destination: A Bright Future

Online courses, more specifically Massive Open Online Courses (MOOCs) have attracted the attention of universities and policy makers around the world, with the promise of democratizing education. Cambodia could use this opportunity, driving the implementation of MOOCs in formal and informal education with ad hoc policies, to support and improve the education and healthcare sectors.

Benefits of MOOCs highest among healthcare professionals in developing countries.

900 Universities around the world offer 11400 MOOCs.

Destination



Why MOOCs?

- ✔ Professional development for teachers and health care professionals.
- ✔ Online courses and FREE.
- ✔ Life-Long Learning: Improves skills and teacher quality.
- ✔ Quality education even in rural areas.
- ✔ Improve capabilities of workers in the healthcare system.
- ✔ Follow up and assessment of patients that live too far away to visit the doctor.

Almost 14 million mobile internet connections in 2019.

117% mobile subscription in Cambodia.

Today

What are we facing without MOOCs?

- ✘ Lack of preparation of teachers and healthcare professionals.
- ✘ Only 2.6% of GDP spent on education.
- ✘ Absence of standard and quality control frameworks.
- ✘ Bad health care, especially in rural areas.

Content and Storyline: Riccardo Corrado, Ph.D.
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developed countries and reach the goal that Prime Minister Hun Sen set for the Kingdom: becoming a developed country by 2050.⁴⁵

Facing the beginning of a new era, called the Fourth Industrial Revolution (4IR), the role of information communication technology (ICT) is more important than ever, and it can provide an important means for motivating the teachers and, at the same time, supporting their PD. "ICT applied to education are all those technologies, including the computer, Internet, broadcasting technologies and any others that can facilitate the delivery of instruction and the learning process itself and at the same time promote international collaboration and networking in education and professional development".⁴⁶ Learners who do not have access to technology and are unable to make use of technological resources are at a clear disadvantage.⁴⁷ Why not use CT as a powerful tool for the education of educators?

Professional Development for Teachers Using Massive Open Online Courses (MOOCs)

In the Universal Declaration of Human Rights adopted in 1948 it is written: 'Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental

freedoms.' Lifelong learning is an important factor for modern economies⁴⁸ and PD for teachers is a fundamental element for assuring a continuous and everlasting quality of the education. A Status Report on Teacher Development in the United States and abroad showed that rigorous training for teachers could positively affect the performance and outcomes of students.⁴⁹ "The use of ICT as a tool for responding to the challenges is one of the most sought-after topics regarding teacher training needs"⁵⁰ and indeed, teachers already make up a significant share of MITx MOOC participants,⁵¹ the MOOCs platform provided by The Massachusetts Institute of Technology (MIT). Ensuring good quality teaching, and a good learning outcome requires a new teaching methodology that teachers need to conduct in order to understand the learning process and pedagogy. Furthermore, teachers should be able to "respond to the needs of their students and the demands of their disciplines", and be able to "develop strong connections between students' experiences and the goals of the curriculum".⁵² "Efforts to improve student achievement can succeed only by building the capacity of teachers to improve their instructional practice and the capacity of school systems to promote teach-

45 Seangly Phak, "'Developed' by 2050: PM," Text, Phnom Penh Post, June 7, 2013, <https://www.phnompenhpost.com/national/%E2%80%98developed%E2%80%99-2050-pm>.

46 Corrado, Flinn, and Tungjan, "Can ICT Help Cambodian Students Become the Solution for Improving Education in the Country?," 2018.

47 Glenda Barlow-Jones and Duan van der Westhuizen, "Digital Literacy in the 21st Century: Fact or Fiction?," in Proceedings of EdMedia + Innovate Learning, (EdMedia + Innovate Learning, Association for the Advancement of Computing in Education (AACE), 2013), 12-17, <https://www.learntechlib.org/primary/p/111925/>.

48 Norman Longworth, *Lifelong Learning in Action: Transforming Education in the 21st Century* (Routledge, 2003), <https://doi.org/10.4324/9780203465684>.

49 Linda Darling-Hammond et al., *Professional Learning in the Learning Profession: A Status Report on Teacher Development in the United States and Abroad* (National Staff Development Council, 2009).

50 Jonatan Castaño-Muñoz et al., "Who Is Taking MOOCs for Teachers' Professional Development on the Use of ICT? A Cross-Sectional Study from Spain," *Technology, Pedagogy and Education*, October 19, 2018, 1-18, <https://doi.org/10.1080/1475939X.2018.1528997>.

51 Daniel Seaton et al., "Teacher Enrollment in MITx MOOCs: Are We Educating Educators?," SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, October 27, 2014), <https://papers.ssrn.com/abstract=2515385>.

52 Darling-Hammond et al., *Professional Learning in the Learning Profession*.

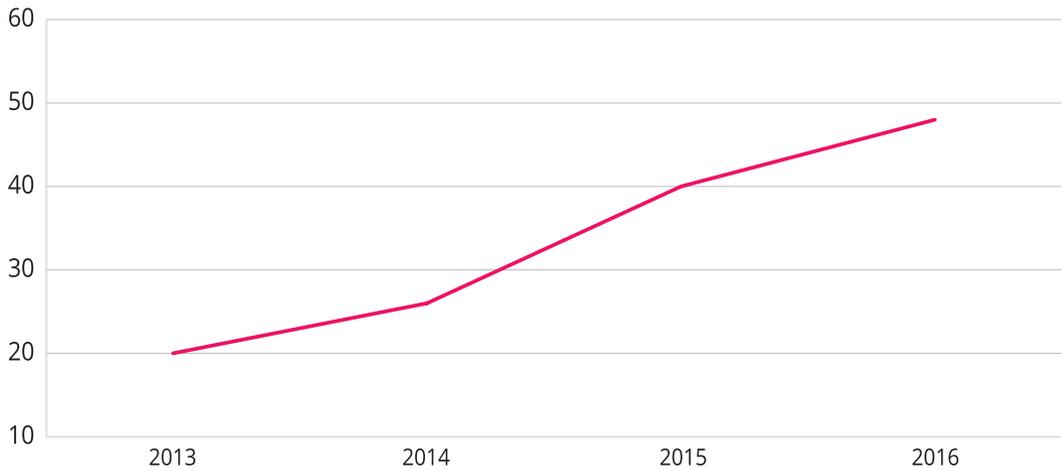


Figure 2: Percentage of Cambodian Who Own at least One Smartphone

er learning”.⁵³ MOOCs have become an interesting channel for teachers’ professional development as they have the ability to remove participation barriers⁵⁴ by, for example, giving teachers the opportunity to attend a training course that may not conform to what they expect to learn without wasting time or money,⁵⁵ or a course that is held at a place or time not accessible to the teacher. Nowadays teachers are extremely busy with work commitments and with their personal life, and thus, little time remains for them to dedicate to professional development. Having online resources to use anytime, anywhere, can represent the key for facilitating PD.

“The increasing amount of insights about digital consumption and infrastructure provide an intrinsic outlook of ICT development and capacity for digital economic activities in Cam-

bodia”.⁵⁶ The penetration of smartphones and the Internet in Cambodia is overall positive. The percentage of Cambodians who own at least one smartphone is 48% (Figure 2), up almost 140% from 2013, when 60% of urban residents had at least one smartphone, whereas the figure for rural residents was only 42%. In 2017 there were 8.5 million Internet users and 19 million mobile subscribers, in a country with a population that barely surpasses 16 million inhabitants.⁵⁷ Furthermore, the ownership of smartphones increases in accordance with the education level, from 27% of those with no formal education to 82% of university students and graduates (Phong, Srou, and Solá 2016).

In July 2018, Mr. Vutha, spokesman for the Telecommunication Regulator Cambodia (an independent public legal entity which performs its functions and duties by autonomous administration and regulation) said that “we want [internet coverage] nationwide by 2020

⁵³ Ibid.

⁵⁴ Castaño-Muñoz et al., “Who Is Taking MOOCs for Teachers’ Professional Development on the Use of ICT?”

⁵⁵ Patricia Gómez Hernández, Carlos Monge López, and Alba García Barrera, “Challenges about MOOCs in Teacher Training: Differences between On-Site and Open University Students,” in Macro-Level Learning Through Massive Online Open Courses (MOOCs) (IGI Global - Disseminator of Knowledge, 2016), 306, <https://doi.org/10.4018/978-1-4666-8632-8.ch069>.

⁵⁶ Kanika Montha, “Cambodia’s Journey to Become a Digital Economy: The Current Landscape,” in Economic Transformation in Cambodia and Abroad, Digital Insights 1 (Phnom Penh, Cambodia: Konrad-Adenauer-Stiftung, Cambodia, 2018).

⁵⁷ Ibid.

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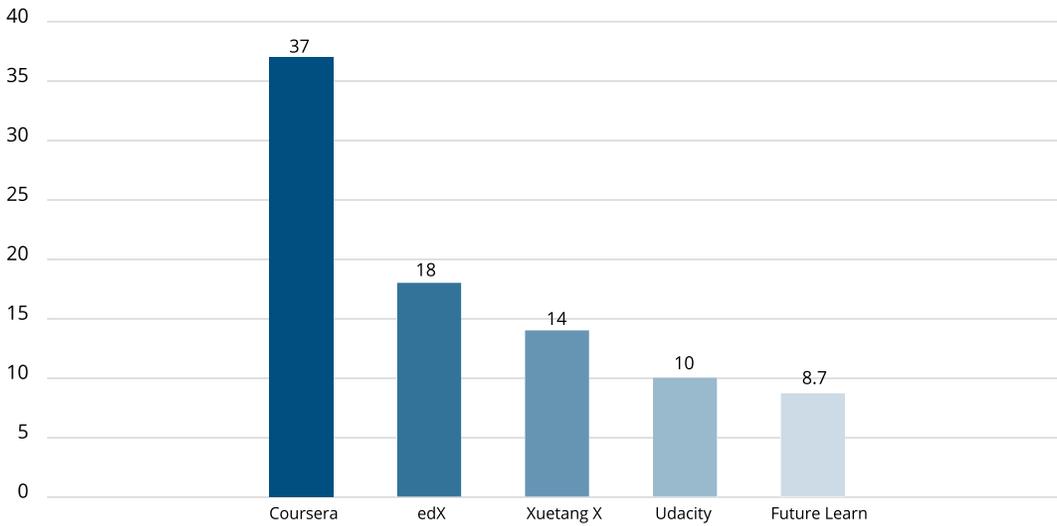


Figure 3: Numbers of users (in millions) in 2018 per platform (data taken from www.class-central.com)

to 2023". In 2016 the Ministry of Posts and Telecommunications (MPTC) confirmed that the telecommunications backbone has been extended to over 26 thousand kilometers,⁵⁸ a remarkable achievement for a country the size of Cambodia. If connections continue to spread to rural areas, there will be more users connected to the Internet" (Chan 2018). In fact, while only one in four rural farmers own smartphones, that number is much higher among younger people, that represents around 80% of the smartphone owners. And, although phone usage in Cambodia is lower than the global average, the use of social media through smartphones is higher than the global average.⁵⁹

What has been described above underpins the idea that ICT and online courses could be used to address the problem of teacher PD,

even for teachers located in the rural areas, and this could represent the right path to follow for the Kingdom of Cambodia. "Nation-wide Internet coverage is not enough to become a digital economy" and "facilitating the growth of new tech-savvy entrepreneurs and tech companies"⁶⁰ is fundamental for Cambodia. This needs to start with creating tech-savvy teachers. MOOCs seem to provide the perfect solution to meet these needs. The hype around MOOCs has increased in the last few years. Brown (2016) wrote: "The current language of crisis, disruption, democratization, and re-imagination in the age of the MOOCs reflects a kaleidoscope of competing and co-existing perspectives with different images of the past, present, and future". "MOOCs have drastically changed the way we learn as well as how we teach. The main aim of MOOCs is to provide new opportunities to a massive number of learners to attend free online courses from anywhere all over the world. MOOCs

⁵⁸ Ibid.

⁵⁹ Desyre Foo, "GROWTH IN CAMBODIA'S MOBILE PENETRATION CHANGING TO HOW..." Geeks in Cambodia (blog), June 25, 2018, <http://geeksincambodia.com/growth-in-cambodias-mobile-penetration-changing-to-how-countrys-farmers-get-information/>.

⁶⁰ Montha, "Cambodia's Journey to Become a Digital Economy: The Current Landscape."

have unique features that make it an effective technology-enhanced learning model in higher education and beyond.⁶¹ Many online platforms already exist that provide access to thousands of MOOCs (Figure 3).

In recent years, we experienced an overall growth of users in the major MOOCs platforms (Figure 4). By the end of 2018, over 900 universities around the world had announced or launched 11,400 MOOCs, with around 2,000 new courses added to the list in the last twelve months.⁶² On top of the growth in the usage of online courses, MOOCs are already seen as a good way to widen access to teacher PD for those instructors who have difficulties in accessing traditional teacher PD.⁶³ There is a sense conveyed that MOOCs herald a new type of innovative pedagogy, which fundamentally challenges centuries-old teaching methods”.⁶⁴

MOOCs can be used not only for teacher PD but also for the PD in other central areas of the country, such as the healthcare system, which is lagging behind compared to the majority of Cambodia’s neighboring countries. Among the four countries in the Mekong region, Thailand has the best living and work conditions, followed by Vietnam, the Lao PDR, and only at the last position we find Cambodia.⁶⁵ It is important to deeply consider all the possibilities that ICT can offer to Cambodia in order to be able to investigate how to use specific technologies to support the growth of the country.

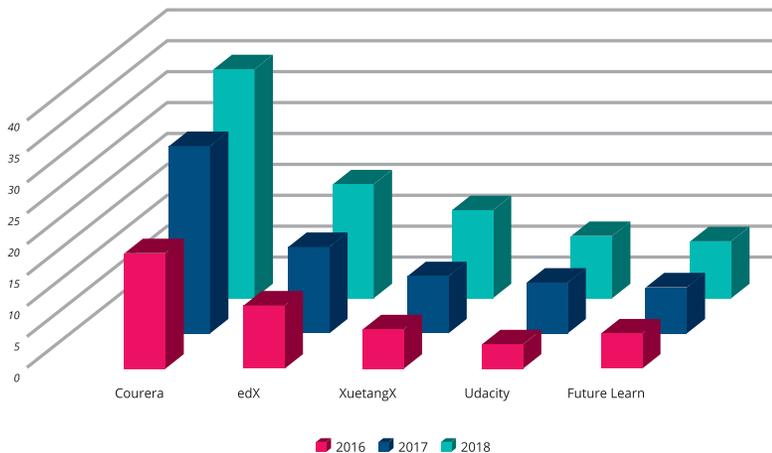


Figure 4: Grow of the number of users (in millions) per platform during the three years period 2016 – 2018 (data taken from www.class-central.com)

- 61 Ahmed Mohamed Fahmy Yousef et al., “A Review of the State-of-the-Art,” in Proceedings of the 6th International Conference on Computer Supported Education (6th International Conference on Computer Supported Education, Barcelona, Spain, 2014), 12, <https://pdfs.semanticscholar.org/be7a/158fc6355c6999cb1d77d760c8ddb4ab9120.pdf>.
- 62 CLASS CENTRAL, “Year of MOOC-Based Degrees: A Review of MOOC Stats and Trends in 2018 — Class Central,” Class Central’s MOOC Report, January 7, 2019, <https://www.class-central.com/report/moocs-stats-and-trends-2018/>.
- 63 Castaño-Muñoz et al., “Who Is Taking MOOCs for Teachers’ Professional Development on the Use of ICT?”
- 64 Mark Brown, MOOCs as Social Practice: A Kaleidoscope of Perspectives, Wenner-Gren International Series (London: Portland Press, 2015).
- 65 Kanjane Phanphairoj and Ritzmond Loa, “Comparison of the Determinants of the Health Service System and the Health Status of the People in the Greater Mekong Subregion (GMS),” Current Psychiatry Reviews 13, no. 4 (December 2017): 246–51, <https://doi.org/10.2174/1573400513666170720145042>.

A New Opportunity for Professional Development and for Supporting the Healthcare System

There is a vast series of public health technical research documents developed by the Pan-American Health Organization which found a strong correlation between economic growth and regional health.⁶⁶ In recent years, health financing policy in Cambodia has focused on reducing the barriers to utilizing services, particularly amongst the most vulnerable Cambodians.⁶⁷ "Based on positive evaluations of early programs, the Cambodian government has emphasized the need for sustained and expanded participation of the community in health care".⁶⁸ Health expenditure per capita is defined as "the amount that each country spends on health, for both individual and collective services, and how this changes over time can be the result of a wide array of social and economic factors, as well as the financing and organizational structures of a country's health system".⁶⁹ Cambodia is still lagging behind compared to the majority of its neighboring countries and as a matter of fact the poor conditions of hospitals and the limited number of licensed healthcare professionals force many people to seek medical treatment

abroad.⁷⁰

In addition to this, a large share of the population in Asian countries still use traditional medicine.⁷¹ Traditional medicine is defined as "the sum total of the knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness".⁷² The majority of the rural population in Laos, for example, relies on local medicinal shopkeepers and informally trained health workers that the shops support, commonly used because they are a cheaper available resource compared to treatment at urban centers.⁷³ Also in Cambodia, traditional Cambodian medical practices are widely used. "They share with Chinese medicine three explanatory models of disease: supernaturalistic theory, naturalistic theory, and maintenance of 'hot/cold' ('yin/yang') balance.⁷⁴ Four forms of therapy are delivered by medical and 'para'-medical personnel: spirit offerings, dermabrasion, main-

66 Andres Aguayo-Rico, Iris Guerra-Turrubiates, and Ricardo Montes de Oca-Hernández, "Empirical Evidence of the Impact of Health On Economic Growth," *Issues in Political Economy* 14 (2005): 17.

67 Tim Ensor et al., "Impact of Health Financing Policies in Cambodia: A 20 Year Experience," *Social Science & Medicine* 177 (March 1, 2017): 118–26, <https://doi.org/10.1016/j.socscimed.2017.01.034>.

68 Marco Liverani et al., "Improving Access to Health Care amongst Vulnerable Populations: A Qualitative Study of Village Malaria Workers in Kampot, Cambodia," *BMC Health Services Research* 17, no. 1 (May 8, 2017): 335, <https://doi.org/10.1186/s12913-017-2282-4>.

69 OECD, "Health Expenditure per Capita," November 4, 2015, 164–65, https://doi.org/10.1787/health_glance-2015-59-en.

70 World Health Organization, *The Kingdom of Cambodia Health System Review*, vol. 2, 5 vols., Health Systems in Transition (Manila : WHO Regional Office for the Western Pacific, 2015), <http://iris.wpro.who.int/handle/10665.1/11356>.

71 Karl Peltzer et al., "The Utilization of Traditional, Complementary and Alternative Medicine for Non-Communicable Diseases and Mental Disorders in Health Care Patients in Cambodia, Thailand and Vietnam," *BMC Complementary and Alternative Medicine* 16, no. 1 (March 8, 2016): 92, <https://doi.org/10.1186/s12906-016-1078-0>.

72 Mark J Richman et al., "Traditional Medicine" (World Health Organization, January 12, 2010), <https://www.degruyter.com/view/j/jcim.2010.7.1/jcim.2010.7.1.1194/jcim.2010.7.1.1194.xml>.

73 Sadia Ali, "Healthcare in the Remote Developing World: Why Healthcare Is Inaccessible and Strategies towards Improving Current Healthcare Models," *Harvard Health Policy Review* 16, no. 1 (2016), <http://www.hhpronline.org/articles/2016/11/10/healthcare-in-the-remote-developing-world-why-healthcare-is-inaccessible-and-strategies-towards-improving-current-healthcare-models>.

74 Richman et al., "Traditional Medicine."

taining ‘hot/cold’ balance, and herbal medicines”.⁷⁵ Furthermore, older people are left out from medical care. In order to make healthcare more suitable for them, efforts need to be directed towards rural areas. “Interventions should include improving management of non-communicable diseases at the primary care level, together with a reconfiguration of social health protection schemes to increase the inclusion of older people” (Jacobs, de Groot, and Antunes 2016).

Over the years, improved access to healthcare services for the poor and disadvantaged groups of Cambodia helped reduce inequities in health. “Delivery at home by unskilled birth attendants is classically predominant among women without an education, who are farmers, or who live in the rural areas or outside the capital city”.⁷⁶ “Initiatives that offer active disease management strategies and promote patients and community participation appear more successful in increasing treatment adherence and decreasing the risk of financial hardship”.⁷⁷

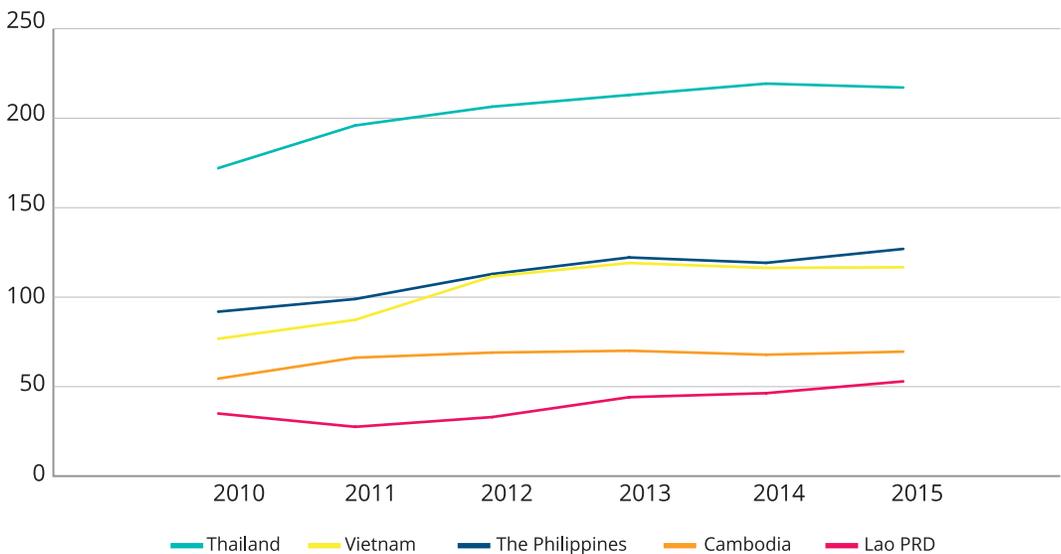


Figure 5: Health Expenditure Per Capita (in US\$) - Data retrieved from The World Bank

For instance, ICT can be used in many ways in order to address the need for improving this scenario. Medical information and technology (MIT) is a great means to help increase the capacity of health services and improve the health service system and health status of the people within a country.⁷⁸ ICT can be considered a tool to deliver information, which can be seen as “a message to inform people which is sent from a sender to a receiver in the form of documents or audible

⁷⁵ Ibid.

⁷⁶ Rathavuth Hong and Rathnita Them, “Inequality in Access to Health Care in Cambodia: Socioeconomically Disadvantaged Women Giving Birth at Home Assisted by Unskilled Birth Attendants,” *Asia Pacific Journal of Public Health* 27, no. 2 (March 1, 2015): NP1039–49, <https://doi.org/10.1177/1010539511428351>.

⁷⁷ Maryam Bigdeli et al., “Access to Treatment for Diabetes and Hypertension in Rural Cambodia: Performance of Existing Social Health Protection Schemes,” *PLOS ONE* 11, no. 1 (January 27, 2016): e0146147, <https://doi.org/10.1371/journal.pone.0146147>.

⁷⁸ Phanphairoj and Loa, “Comparison of the Determinants of the Health Service System and the Health Status of the People in the Greater Mekong Subregion (GMS).”

or visible communications to change the way the recipient perceives something or to have an impact on his judgment and behavior".⁷⁹ Improving cost-effectiveness, supporting access to information, bridging cultural gaps between different groups and increasing educational accessibility are only some of the numerous advantages that ICT can offer to the national healthcare system, but in this chapter we are going to focus mainly on one of them: what ICT, or more specifically, MOOCs, can do to support the professional development of informal and formal medical staff and thereby support overall the healthcare services within Cambodia.

Research proves that MOOCs can effectively improve the capability of workers involved in healthcare systems and support their professional development. In Wewer Albrechtsen et al.⁸⁰ the authors investigated the benefits for medical staff involved with patients affected by diabetes. The authors investigated the development in professionals, that followed and completed an online diabetes MOOC titled "Diabetes – a Global Challenge". This online course is characterized by instructor-guided lessons combined with quizzes and assignments, as well as the possibility to obtain an official certification of completion. The participants were encouraged to join online discussions in forums together with peers and instructors in order to be able to exchange comments, opinions, and knowledge. The medical staff involved in this research included healthcare professionals such as medi-

cal doctors, researchers, nurses, and medical students. The results showed that over 80% of the health care participants reported some educational benefits, such as improved knowledge about prevention and treatment therapies for diabetes and improved capacity in professional practice. Additionally, this research showed that among the almost 30 thousand participants, those coming from developing regions, such as Africa, the Caribbean, Central America, South America, Asia (excluding Japan) and Oceania (excluding Australia and New Zealand), gained more impact on their clinical practice compared to health care professionals from DEVELOPED countries regions. This is an example of how MOOCs may be considered really useful for developing countries like Cambodia, that still need more knowledge on prevention and treatment techniques, in order to improve clinical practice in their health care ecosystems. In one study performed among medical undergraduates in Egypt, students who actively participated in learning through MOOCs "showed a positive attitude towards the experience",⁸¹ highlighting the requirement for better time-management skills and faster Internet connection speeds. World Health Organization Hinari identifies countries with an average income below 12 thousand US Dollars, and "has created a network of publishers and institutions that make their medical teaching and journals freely available to those countries".⁸²

It should be said that even though MOOCs can be very useful for developing countries, there

79 Jahid Hossain Panir, "Role of ICTs in the Health Sector in Developing Countries: A Critical Review of Literature," *Journal of Health Informatics in Developing Countries* 5, no. 1 (2011): 12.

80 Nicolai J. Wewer Albrechtsen et al., "Health Care Professionals from Developing Countries Report Educational Benefits after an Online Diabetes Course," *BMC Medical Education* 17, no. 1 (May 31, 2017): 97, <https://doi.org/10.1186/s12909-017-0935-y>.

81 Omar A. Aboshady et al., "Perception and Use of Massive Open Online Courses among Medical Students in a Developing Country: Multicentre Cross-Sectional Study," *BMJ Open* 5, no. 1 (January 1, 2015): e006804, <https://doi.org/10.1136/bmjopen-2014-006804>.

82 Kieran Murphy and Peter L. Munk, "Continuing Medical Education: MOOCs (Massive Open Online Courses) and Their Implications for Radiology Learning," *Canadian Association of Radiologists Journal* 64, no. 3 (August 2013): 165, <https://doi.org/10.1016/j.carj.2013.06.001>.

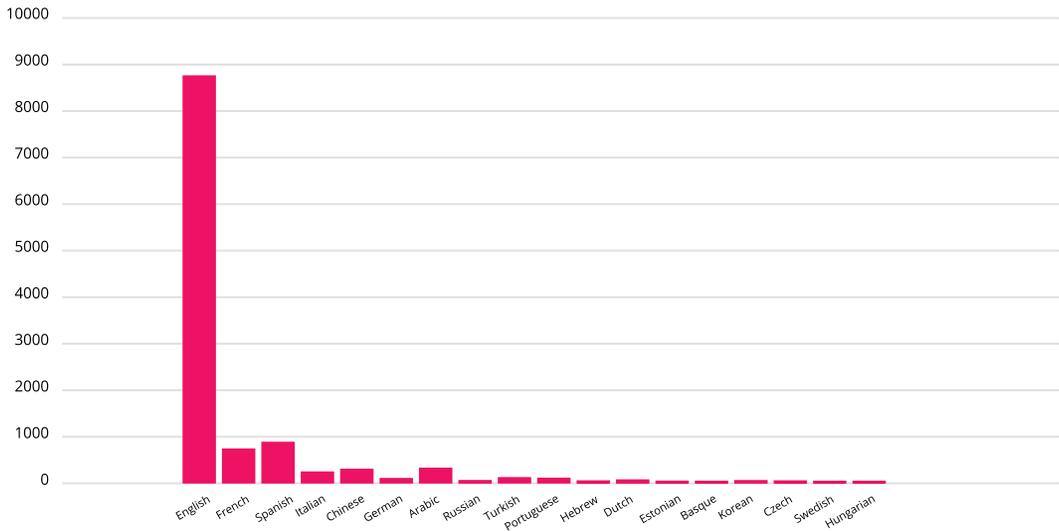


Figure 6: MOOCs by Language (data retrieved from CLASS CENTRAL)

are some serious limitations on their implementation in the countries that need them the most. One of them, for example, is the language barrier. In fact, the majority of MOOCs are provided in English, French or Spanish (Figure 4). In a world where, as estimated in 2009, two billion people worldwide are trying to learn English, Cambodia is gradually integrating itself into the regional and global economy,⁸³ but many Cambodians, mainly in the rural areas, are unable to follow MOOCs in English.

Furthermore, as far as MOOCs in healthcare and medicine are concerned, the majority of courses are offered by developed countries like the United States, United Kingdom or Australia, and only a few MOOCs were offered by developing countries such as China, the West Indies and Saudi Arabia.⁸⁴ This language barrier

could present an even harder limitation on non-professional workers in developing countries, such as caregivers, helpers, and even families of patients, who want to access useful information regarding health conditions by using MOOCs.

In addition to using MOOCs for professional development and for the knowledge improvement of informal caregivers, they can also be adopted in healthcare to assess patients. For instance, in Muñoz et al.⁸⁵ the authors showed how these online courses can be used as a tool to perform follow-ups and assessments of patients and participants of specific medical treatments. Following the course and completing specific assessments, as part of MOOCs, allows professionals to evaluate the effectiveness of the interventions on their patients. This solution addresses the problem of those participants who can't or don't want

⁸³ Bun Tharum, "The Importance of Speaking English," Newspaper, Phnom Penh Post, February 10, 2010, <https://www.phnompenhpost.com/lift/importance-speaking-english>.

⁸⁴ Liyanagunawardena Tharindu Rekha and Shirley Ann Williams, "Massive Open Online Courses on Health and Medicine: Review | Liyanagunawardena | Internet

Research," *Journal of Medical Internet Research* 16, no. 8 (2014), <https://www.jmir.org/2014/8/e191/>.

⁸⁵ R. F. Muñoz et al., "The Impact of Phone Calls on Follow-up Rates in an Online Depression Prevention Study," *Internet Interventions* 8 (June 1, 2017): 10–14, <https://doi.org/10.1016/j.invent.2017.02.001>.

to take part in official follow-up assessment sessions in clinics, due to problems such as long distances between their house and the medical facilities, the cost for transportation or simply lack of time. These present common issues for patients in developing countries, therefore professionals could use technology to obtain measures of clinical outcome at every visit to the intervention site so that they can at least report the last assessment score obtained from the participant.

MOOCs are an easily adoptable solution for professionals in the healthcare sector for assessing and following up with their patients, and could benefit both patients and care providers, especially in developing countries like Cambodia. There are some difficulties in implementing it, but there are strategies that can be used to help combat these challenges, including “developing access hubs at strategic central locations to provide the required technology and internet access” and “developing offline content delivery platforms to overcome slow internet connectivity”.⁸⁶

Conclusions

At the dawn of the Fourth Industrial Revolution, Cambodia needs to adapt to a rapidly changing world, especially if it is to meet the plan of Prime Minister Hun Sen for the Kingdom to become an upper-middle income

country by 2030, and a high-income one by 2050.⁸⁷ The healthcare and education systems are still lagging behind. Families that can afford it send their sons and daughters to study at universities abroad due to the lack of trust in Cambodian higher education. And the same happens with medical care. Those who can afford it travel to Singapore, Thailand or Vietnam⁸⁸ because the medical care within Cambodia is untrustworthy.⁸⁹ Cambodia must address these issues by building good education and healthcare systems. Heavy investments are required in these two fundamental sectors, and most importantly everything must start from providing high quality training to the new generation of professionals. Furthermore, professional development needs to support the continuous growth of educators and professionals involved in the healthcare sector in order to facilitate their lifelong development. To address this requirement, MOOCs offer the perfect digital technology driven solution. Institutionalizing PD for professionals through MOOCs as a requirement for their profession can be a feasible solution to support PD, as they are easy to access and relatively low cost. Changes in the regulations to include MOOCs among recognized forms of

⁸⁶ Tharindu Rekha and Williams, “Massive Open Online Courses on Health and Medicine: Review | Liyanagunawardena | Internet Research.”

⁸⁷ Xinhua, “Cambodia Aims to Become ‘Developed Country’ by 2050,” Xinhuanet, 2018, http://www.xinhuanet.com/english/2018-03/15/c_137041624.htm.

⁸⁸ Thmeythmey, “Why Do Cambodians Still Go Abroad for Medical Care?,” ThmeyThmey.com, accessed June 23, 2019, <https://thmeythmey.com/event/?page=detail&id=40530>.

⁸⁹ “Building Trust in Local Doctors and Healthcare,” Khmer Times (blog), August 21, 2016, <https://www.khmertimeskh.com/27012/building-trust-in-local-doctors-and-healthcare/>.

PD could make MOOCs more widely accepted for TPD⁹⁰ and their usage among teachers could become a normal approach to the PD of the teachers in Cambodia, whose role is to trigger curiosity and provide an effective and positive learning experience to the younger Cambodian generations. “It is the supreme art of the teacher to awaken joy in creative expression and knowledge” said Albert Einstein, and we need to do our best in order to support those actors directly involved in the process.

To conclude, though MOOCs present a great opportunity for Cambodia, it is also true that “open online courses are neither useless nor the salvation of higher-education”⁹¹ and of PD

in general, both for teachers and professionals involved in the healthcare sector. Thus, the adoption of MOOCs can’t and must not be seen as a panacea to all the problems in these areas. Major investments and structural changes are needed in both sectors, from the introduction of board exams and standards, which can help ensure minimum quality requirements, to other aspects such as boosting extrinsic motivation in the jobs through financial incentives to said professionals, as well as rural area development policies. But MOOCs are certainly a perfect digital technology driven solution to support constant PD and to facilitate the growth of high caliber professionals in the Kingdom of Cambodia.

90 Castaño-Muñoz et al., “Who Is Taking MOOCs for Teachers’ Professional Development on the Use of ICT?”

91 Andrew Ho et al., “HarvardX and MITx: The First Year of Open Online Courses, Fall 2012-Summer 2013,” SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, January 21, 2014), <https://papers.ssrn.com/abstract=2381263>.