

# A preliminary evaluation of eLearning, mLearning and online examinations at SONAM, Ho, Ghana

Draft Report, 20/01/2020  
Karsten Gareis

## 1 Background

### 1.1 SONAM-HITA Strategy for eLearning and mLearning

Based on its extensive track record in equipping Health Institutions across Ghana with information & communication technology (ICT) systems, German NGO Health Information Technology for Africa (HITA) proposed in 2017 to the School of Nursery and Midwifery (SONAM) at the University of Health and Allied Sciences (UHAS), Ho, Volta Region, to set up an eLearning and mLearning system that would optimally support teaching and self-learning throughout the school. This would complement the existing eLibrary but offer significantly enhanced performance suitable for full incorporation in teaching and the execution of online examinations at SONAM.

To this effect a Memorandum of Understanding was signed in 2017 between HITA and SONAM. The agreement comprised the share of responsibilities for provision, installation and maintenance of the equipment. HITA was to provide the equipment for one or several computer labs containing dozens of fully operational computer workplaces and networking infrastructure (both Ethernet LAN and wireless LAN). Initial installation was carried out jointly by HITA staff and SONAM's ICT staff.

The activity is fully congruent with the medium-term strategies of both UHAS and SONAM:

- One of the 10 strategic objectives of UHAS is “to invest in information technology platforms that enhance the ability of UHAS academic, research, teaching and learning communities to collaborate with each other and with global partners.”<sup>1</sup>
- Two of the six core values and philosophy are “applying innovative educational approaches and technologies (including distance learning) to enhance access to programmes with a focus to train high calibre nurses and midwives at all levels of education“ and “using modern information and communication technology (ICT) and other education tools to drive this programme wherever possible”<sup>2</sup>.

### 1.2 National Strategy for Licensing Examinations

In its 2015 Five-year Strategic Plan, the Nursing and Midwifery Council of Ghana (NMC) set out for “A-to-Z digitization of the licensing examination process”. To make progress on this objective, NMC has benefitted from funding and strategic support from the Netherlands Initiative for Capacity Development in Higher Education (NICHE), funded by the Government of the Netherlands. This way, Ghana strove to become only the third country in Africa (after Kenya and South Africa), as well as the first in West Africa to adopt a system of online examination to certify nurses and midwives.<sup>3</sup>

---

<sup>1</sup> <https://www.uhas.edu.gh/en/about-us/strategic-objectives.html>

<sup>2</sup> <https://sonam.uhas.edu.gh/en/about-us/sonam>

<sup>3</sup> <https://newsghana.com.gh/nmc-begins-online-licensing-examination-for-midwives/>

A first project “Introducing online Licensing Examinations for student nurses and midwives” to prepare for the establishment of online examinations commenced in 2014 and ran until 2018. It was operated by CINOP Global, a Dutch consultancy operating in the development sector.<sup>4</sup>

The online examination process was initially developed to run in three nursing and midwifery training colleges (NMTCs), and limited to Mental Nursing Licensing:

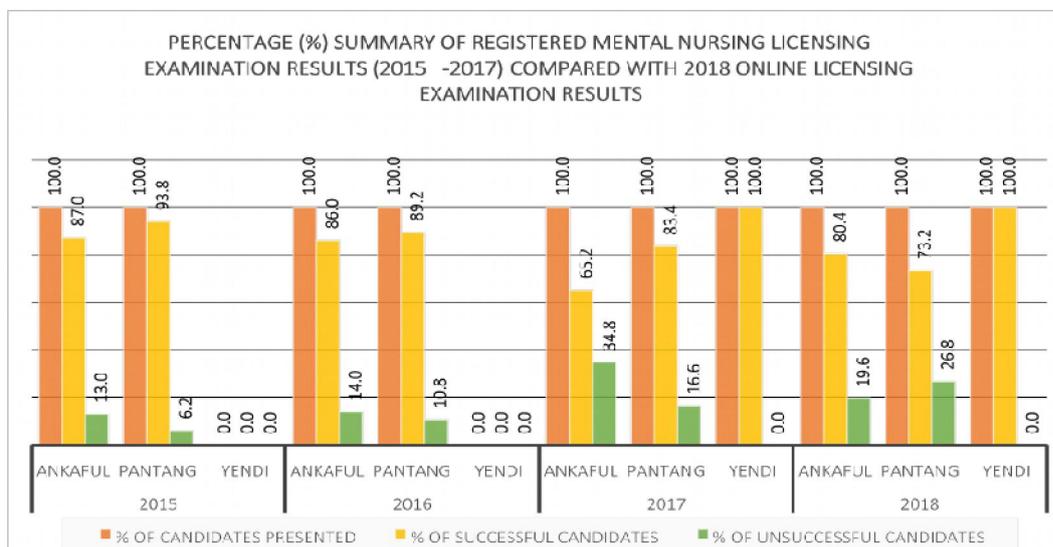
- College of Health Sciences, Yendi (Northern Region);
- Nursing Training College, Pantang (Greater Accra Region);
- Nursing Training College, Ankaful (Central Region).

A mere two “mock examinations” were conducted in all three schools before the first de facto online licensing examination, which took place on 3 September 2018. Training measures appear to have been targeted exclusively at practical examiners and assessors.

The online examination consists of four modules:

- A practical examination using a tablet (except for the care plans and the case study, which are still done paper based);
- A first exam consisting of 180 multiple choice questions (3 hours);
- A second exam consisting again of 180 multiple choice questions (3h);
- A third exam consisting of 100 multiple choice questions (1h40).

To avoid cheating, question items are randomised so that no candidate is shown the same questions in the same order. The practical examination makes use of rating by teams of two examiners each and are conducted using a tablet uploaded for the purpose with specially programmed apps; rating results are directly transmitted to the central system through a WiFi link.<sup>5</sup>



Source: <https://www.nmcgh.org/t3f/en/documents-forms?download=31:developing-and-implementing-online-licensing-examinations-for-nurses-and-midwives-in-ghana>

In addition, a state-of-the-art computer laboratory was set up at the NMC Head Office in Accra, intended for allowing schools that do not have sufficiently well-functioning computer laboratories (or none at all) of their own to use that of the Council.

<sup>4</sup> The total value of the grant awarded for both this and the related NICHE project “Capacity Building of Senior Staff on Strategic Management and Leadership Skills” was €1,067,250.

<sup>5</sup> [www.myjoyonline.com/lifestyle/2018/september-3rd/nursing-and-midwifery-council-conducts-first-online-students-examination.php](http://www.myjoyonline.com/lifestyle/2018/september-3rd/nursing-and-midwifery-council-conducts-first-online-students-examination.php)

It appears that no independent evaluation of the switch to online examinations at the three participating colleges was conducted. The mere fact that the pilot was successful from a technical and organisational perspective, combined with assumptions about benefits such as savings in time and effort, seemed to be have been sufficient for the decision to roll out online examinations to other nursing and midwifery programmes and colleges.

The follow-up NICHE project, “Strengthening the examination capacity of the Nurses and Midwives Council of Ghana” (2017-2021) is coordinated by CINOP Global together with the Kwame Nkrumah University of Science and Technology, Kumasi. Gradually, online licensing examinations have been rolled out to other training programmes:

- Registered Mental Nursing (September 2018)
- Six Post Basic Programmes (December 2018)
- Post NAC/NAP Midwifery Programmes (March 2019)
- Registered Community Nursing (September 2019)
- Registered Midwifery (currently in preparation for March 2020 dates)

After these, next in line are the Registered General Nursing programmes, for which online examinations are planned to be introduced in 2021. The plan presents a considerable challenge in terms of capacities because of the large numbers of students enrolled in these programmes.

From 2019 on the NMC invited any NMTC “that is ready” to participate in the online examinations. Readiness is determined by means of an on-site visit by the NMC, after which – if findings are positive – schools get accredited. Schools in the vicinity of an NMTC participating in the NICHE project have the additional option of sending their students there for the purpose of taking the examination.

According to data published by the NMC, 1,073 candidates from 22 NMTCs took part in the March 2019 online licensing examination for the Post NAC/NAP Midwifery candidates. The examinations took place in 13 accredited computer labs across Ghana. (<https://www.graphic.com.gh/news/general-news/ghananews-1073-candidates-prospective-midwives-complete-online-licensing-examination.html>). Since the total number of NMTCs offering Post NAC/NAP Midwifery programmes in Ghana is 39, only little more than half of all schools participated in the online examinations.

The remaining schools that do not yet have the capacity for letting sufficient numbers of students carry out examinations online (because their computer lab is too small or does not perform well enough, or teaching staff do not yet have the necessary skills) have the option of:

- continuing to hold examinations in the traditional, paper-based way;
- asking their students to travel to an accredited computer lab at a NMTC in the vicinity (or the NMC’s model computer lab, if Accra is within convenient reach).

At the time of writing, no national plan for rolling out online examinations to all of the country’s NMTC is in evidence.

## 2 Set-up of the Infrastructure for eLearning and mLearning at SONAM

### 2.1 Set-up of the infrastructure to enable eLearning, online testing and online examinations

For some years already, SONAM has been operating a so-called e-Library and a WiFi network, both of which available to students for self-learning. The capacity of both systems in terms of bandwidth and

workplaces was too small, however, to make a real difference to day-to-day learning and teaching at SONAM.

Against this background, SONAM and HITA agreed in 2017 to establish a powerful computer lab comprising 40+ workplaces plus ethernet and wireless networks in an effort to kick-start the mainstreaming of online modes of learning and teaching across the school. HITA donated the equipment consisting mainly of used but fully checked and reconditioned desktop PCs, monitors, printers and routers, in addition to brand new networking infrastructure. Installation of the equipment was carried out jointly by HITA and SONAM staff in spring 2018. The computer lab was set up in a former classroom. After initial training by the HITA experts, the SONAM ICT staff has taken responsibility for continuous maintenance, for which if needed they can call upon advice from HITA by means of a dedicated WhatsApp group. Bigger maintenance and repair tasks are tackled during the (at least) annual visits of HITA's team on the SONAM site.

### xxx Description of computer lab and (W)LANs

## 2.2 The HITA/SONAM Learning Management System

### 2.2.1 Set-up

For Learning Management System (LMS), Moodle was chosen due to its nature as a free, open-source application and the fact that it is by far the most widely used LMS in low-resource countries including Sub-Saharan Africa.

The HITA/SONAM Moodle platform was set up in summer 2018. Steps included:

- Installation of the Moodle software on the server
- Configuration and set-up of 20 selected courses deemed particularly suitable for the pilot
- Set-up of user accounts
- Assigning users to courses
- Assignment of two dedicated IT staff members to the HITA computer lab for providing hands-on support to Moodle users
- Introduction of the system to all faculty (~200)
- Half-day training sessions with all 13 faculty members participating in the pilot
- Half-day training sessions with all ~650 students taking the courses covered by the pilot
- Provision of on-site hands-on support to any user visiting the HITA lab

Based on the experience made with day-to-day operation of the computer lab, some adjustments were made in order to avoid performance problems. This concerned, in particular, upgrading the internal memory of desktop computers. Because of the ready availability of spare parts, many of which also donated by HITA, and the effort invested by the SONAM ICT team, it has been possible to operate the computer lab at full capacity since its inception.

The Moodle system was set up by the two members of team who have most knowledge about LMS. During this phase there were some problems with linking to content from the Internet, which had to do with the firewall. With the help of HITA staff these problems could be tackled.

In April 2019 the number of registered Moodle users was 675. This includes 13 lecturers (9 at the start of the pilot; 4 joined early in 2019) and 100/200/300 students (i.e. 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> year students) taking the courses selected for the pilot. Detailed log data is available for producing statistics about patterns of usage, etc.

Two persons were assigned in spring 2019 to oversee the HITA computer lab during usual operating hours. Their responsibility comprises looking after the equipment, i.e. to take care of security issues, to ensure that rules of conduct are followed (e.g. no use of the equipment for private purposes) and, most importantly, providing hands-on support to the users, both students and lecturers. Both had previous experience with Moodle as students (one of them back in 2008) but required some additional skills in taking the position of somebody who uses Moodle as a lecturer. They received training and advice from the core Moodle team, in addition to self-learning using online resources such as YouTube tutorials. Since then they have learned on the job (“We learn new things every day, e.g. how to deal with formatting problems”). Unfortunately, due to some reshuffling of personnel within SONAM in the second half of 2019, this position had become vacant by the time of the January 2020 observation; currently no single person is in charge of day-to-day support at the HITA computer lab.

### 2.2.2 Patterns of use in April 2019

To explore the use of both the HITA computer lab and the Moodle platform, the author carried out an observation in spring 2019 on site of the HITA computer lab.

At the time of the observation, taking tests online has become common practice in all of the courses covered by the pilot. Students, however, appeared to be less than enthusiastic because they seemed to lack the confidence in using computers as opposed to pen-and-pencil examinations. The lecturer used the occasion to remind students that they will need to acquire some proficiency in taking tests electronically, as the national end-of-semester examinations would be conducted online soon (it was eventually introduced at SONAM in the second half of 2019). He also appealed to a belief in progress (“Come on, times are changing. This is progress!”).

The lecturer had prepared the quiz (questions and response options) in advance using a text processor, based on the curriculum for the course in question. In the evening before the examination, he had uploaded them to the Moodle system, for which he visited the HITA lab, where he could make use of the support by the present members of the ICT team. He copied the questions to Windows Notepad, formatted them according to the rules of Moodle (e.g. removal of numbering) and then uploaded them to the system. During the process some problem occurred, as when Moodle did not import any text including special characters such as “-“. For this reason, some re-uploads were required before the quiz appeared as intended on the Moodle screen. Also, at this time the lecturer and the ICT staff discussed how to set the basic specifications for the quiz, such as duration, number of attempts allowed, number of questions displayed, shuffling of questions and response options. The latter was used to keep students from cheating by viewing the screens of their neighbours.

The scheduled time for the test could not be maintained due to a ~90 minutes power outage in the morning of the examination day. This required a rescheduling to the afternoon of the same day.

Because of the limited size of the computer lab, which currently has a capacity of 40, students had to take the exam in three shifts. The lecturer and two members of the ICT team remained present throughout the exams. They provided support on demand when some of the students faced any technical problem with the computer or Moodle system. This seemed to work extremely well, every student was able to take the exam as planned.

To avoid students using their smartphone to access the LMS (and take the exam) while outside of the computer lab, each shift of students was provided with a different, one-time password for being able to start the test.

When asked to log into the system, some students turned out to have forgotten their password. They had been asked to make sure they know their password by the day before the exam, and in case of doubts visit the computer lab and ask for a new password. Nevertheless, about five students per shift needed to be supplied with a temporary password immediately before start of each test session.

ICT staff confirm that students most often require support for password reset. They also ask many practical questions, “how to do this and that”, for which it is great to have hands-on support. According to the observations of the ICT staff quite a few students are also lacking basic computer skills.

Some students were found trying to cheat. One tried to take the exam two times after she was disappointed with her grade the first time around. The Moodle system did not allow her to do so, as it was programmed to allow only one attempt not only per student, but also per question. Another one tried to make use of screenshots taken by a student with his phone when taking the exam as part of an earlier batch, but was found out by the lab staff. A third one had opened a pdf of a textbook also accessible via the Moodle platform and tried to look up solutions to questions (this will in future be avoided by disabling user access to any other Moodle features apart from the quiz itself for the duration of the examination). Cheaters will receive some sort of punishment in line with university regulations.

After the time allowed for taking the test had run out, students automatically received their grade on Moodle. They were then asked to log out and leave the room, for the next shift to enter.

The lecturer was able to watch students’ performance in real time using the Moodle dashboard. After all course participants have completed the test, he was then able to download course results in the form of a spreadsheet file, which he then took with him for further processing on his own computer.

Typically, students use the laboratory only when taking part in quizzes or examinations. Some lecturers have also uploaded material related to their course available for download.

In principle, students can access the computer lab any time of the day during operating hours. In practice, however, it appears that the lab is often locked because none of the ICT staff is present (this was the case, in particular, in January 2020). Students need to seek permission to use the computers from the ICT staff (or lecturers if present) before they can sit down and log onto a PC.

No progress has yet been made with setting up a central online library consisting of eBooks and articles. The university subscribes to a number of online journals / databases and the rights to distribute online versions of some textbooks have been secured.

### 2.2.3 Developments since April 2019 and the immediate future

The first national online licensing examinations coordinated by the NMC were conducted at SONAM in August 2019. In preparation of the event, an NMC team visited the SONAM facilities and awarded the required accreditation. The team voiced some concerns that it would be too easy for students to cheat by viewing the neighbour’s screen – a result of the crowded seating arrangement in the current computer lab.

To address this challenge, the plan is to equip the existing eLibrary at the Dave site with 100 networked computers. For this some of the cabling and preparatory work had been done by the end of 2019, with the exception of provision of the required number of pieces of furniture. HITA provided desktop computers and monitors in January 2020. Once operational, the Dave computer lab will

increase SONAM's capacity for eLearning and conducting online examinations considerably, also because it offers much more space per workstation.

SONAM's first experience with online licensing examinations was a success. As the examinations took place at the very same time in many NMTC across Ghana, and data were sent in real time to the NMC headquarters in Accra, there were some minor issues with the speed of data transmission. The reason for these appeared to be the limited capacity of the NMC server to process the data simultaneously.

Since a sufficient number of tablets was not available at SONAM, the practical part of the examination was carried out in the traditional way.

In the medium future, UHAS may become an examination centre that will also serve the students enrolled in smaller NMTCs around the region. This would mean students will be bussed from all around the region to SONAM to take the end-of-semester examinations. Related training of student users and lecturers would also need to be done on site at UHAS. The conditions are good for SONAM to become a centre of excellence for online training which is acknowledged nation-wide.

A first taste of how this will look like was given in autumn 2019 when SONAM's facilities were successfully used for the purpose of an online examination by students from the nearby Ho Technical University.

There are no plans yet to use Moodle Mobile in addition to the standard Moodle platform. The current platform can, however, also be accessed by students via their own mobile computer or smartphone. Access is only available on the campus (in April 2019 this concerned only the part of the campus where the lecture halls are located). This problem was addressed by the HITA team in January 2020.

### 3 Findings from interviews with teaching staff

The author conducted interviews with seven members of the teaching staff who already make use of the Moodle system within the courses they teach (April 2019 and January 2020), and in addition with five members of the SONAM ICT team (April 2019).

The teaching staff report that they use the Moodle platform heavily for examinations/quizzes. One lecturer reports that he has an exam the day after in which 105 pupils would take part. They would enter the lab in three shifts as the computer lab only has around 40 workplaces. To avoid allowing students to cheat by viewing the screen of the neighbour, both questions and response options are shuffled automatically. To avoid students to gather information from others who have already taken the test, users do not receive information whether their responses were correct, but only the grade for the whole test. The use of smartphones during the stay in the computer lab is prohibited.

#### 3.1 Perceived benefits

Time-savings are reported as significant resulting from use of the system for testing/quizzes. While correcting paper-and-pencil tests takes a lot of time due to the large size of the courses, once a quiz on Moodle has been operated, grades and statistics are produced by the system and can be printed out easily.

Lecturers report that it took some effort at the beginning to get used to how the system works. In particular, understanding the formatting (notepad), spacing and numbering posed a challenge. "It

gets easier, however, each time you work with the platform. By now we are used to it and do not need much time anymore for uploading a quiz and processing results”.

### 3.2 Technical challenges

Electricity outages pose a problem. A generator serving the entire Trafalgar campus has been purchased but is not yet operating. At the day of an examination, there was a “lights off” for about two hours, which meant both the lecturer and student had to postpone preparation and execution of the test. In addition, usability of the HITA lab and the eLearning system is also affected by frequent internal connectivity problems and on-and-off Internet provision by providers Vodafone and MTN.

Lecturers could not access the system from their offices due to WLAN coverage problems, which arose some months after implementation. This means that they had to visit the HITA lab to upload quizzes and other content. While this has the advantage that support is available on-site from the ICT team, it reduces flexibility. Measures were taken in January 2020 to ensure that HITA mobile network covers the whole campus again, after which this problem should evaporate.

### 3.3 Non-technical challenges

The largest course taking part in the pilot is ~250 strong, which means that with only a 40-seat capacity of the lab, it can take a long time until all students have been able to take the test.

Uploading content sometimes proved to be burdensome: Difficulties arose when trying to format questionnaires and designing tests. Problems also arose when trying to import material from the web, e.g. from YouTube. ICT staff confirm that the main task for which they are called upon by lecturers is to help with formatting (spacing etc.) and embedding of content.

In general, lecturers report that they do not use the Moodle platform to the maximum yet, but mainly for examinations and to some extent for distributing course material. Regular coaching is perceived as necessary to enable tutors to update and enhance their skills and subsequently to use more and more features of Moodle. For example, training would be needed for ways how to properly integrate content from websites, YouTube etc. Once this becomes common practice, it would bring additional major benefits.

### 3.4 Satisfaction with training/support received

The training consisted of a first orientation session with the pilot group as well as an introductory presentation to which the whole faculty was invited. The orientation session lasted a few hours and took place in the HITA lab, where participants could log into the account created for each of them by the Moodle team.

Day-to-day support is provided by the ICT staff present at the HITA lab. Lecturers voice great satisfaction with this support. The ICT team working at the lab seemed to take good care of security as well. The interviewees wonder whether more should be done to keep motivation of the lab support team high in the medium to long term.

The ICT team states that at the moment they seem to be able to provide all training users ask for. All lecturers taking part in the pilot were trained in batches; some of them still need some fresh-up; which will be provided. The capacity in terms of personnel is sufficient. One challenge reported is that lecturers need to make available some time as well; there is the perception that some of them find it hard to free themselves up for training. A lot of one-on-one training appears to be needed as well.

### 3.5 Training needs

Students received some initial training from the ICT team, but many of them still appear to lack the experience for using computers confidently. This is confirmed by research conducted by Osman (2017) and by the author (xxx). One way to improve the exposure of students to computers would be for the Academic Office to factor in a regular day for eLearning as part of the academic schedule for each semester.

Lecturers participating in the pilot feel that, if use of the Moodle platform was made mandatory for the whole faculty, it would be well accepted. While there are a few (mostly older) lecturers who might not yet be ICT-confident enough to use it without a larger amount of training, most of the faculty are young and eager to work with computers.

The ICT team members report that, once the number of users of the Moodle system has grown beyond the extent of a pilot project, user support needs to be made more efficient, i.e. less dependent on hands-on support. Paper and online tutorials will need to be prepared to help in dealing with FAQs. Some routine issues can be automated. Powerpoint presentations could be designed to enable self-learning. Moreover, some non-ICT staff should be engaged as trainers as well, using a train-the-trainer approach.

### 3.6 Acceptance by students (majority/hard-to-reach) as perceived by tutors

Lecturers report that students seemed not enthusiastic about taking quizzes online, since this involved more effort for them compared to taking a test the traditional way, i.e. via paper and pencil. They appear to not yet being used to the system and therefore appear to lack confidence in using the system. Some are “begging for the old system”. Motivation is an issue, as some students find it hard to adapt to the change. For some who are not that ICT-savvy it takes a long time to get used to working on a PC.

By now most students do not seem to see much tangible benefit from the new system. They mostly use the HITA lab on schedule, i.e. for taking quizzes/exams or other PC-based activities which are part of the course. Lecturers expect that, once students feel confident in using the system and can use it whenever they want, they will feel more motivation for using the Moodle system.

As the online platform is so far used only for examinations and testing, students can get accustomed to using it before they will have to take the national end-of-semester exams online, which started in August 2019. There is general agreement that students need to get exposure to online working as early as possible.

### 3.7 Ideas for future improvements/enhancements/applications

A university policy on eLearning, such as it is in place at more advanced universities, has not yet been established at UHAS. Lecturers comment that, before the platform will be rolled out to all students and courses (and other UHAS Schools), such a policy should be agreed upon.

Storing teaching material / content such as electronic textbooks, video clips centrally on the SONAM server and making it available via Moodle would be strongly welcomed. A lecturer of the course on professional midwifery states that there is a lot of content available from open access sources online, including video content. Concerning textbooks, licenses would need to be acquired. UHAS subscribes to a number of databases of academic articles that could also be made available this way. Co-operation with the UHAS eLearning unit at the permanent site would be useful for this purpose but has not yet become common practice.

For the documentation of their own practical experience (mandatory internships e.g. at a hospital), students currently use a booklet issued by the NMC. This is used by lecturers in the process of assessing the performance of their students. This procedure is prone to causing problems as students sometimes lose the document or fail to deliver it to the lecturer when requested. One lecturer voices the idea to let students document their practical experience in an electronic document placed on the Moodle platform. This would greatly increase efficiency on the part of lecturers and, to a lesser extent, also students.

Using the platform also to allow users to upload self-created content or content derived from third sites is another area lecturers consider worth exploring. They report that students share content anyway using their smartphones (e.g. via Whatsapp groups), but once the platform was used for this purpose lecturers could control the content for quality.

## 4 Discussion

The number of accredited nursing training institutions in Ghana is currently 119, and still growing. Only a small share of these are currently in a position to conduct online licensing examinations. The remaining schools are asked to send their students to the nearest accredited computer lab.

In practice this means that students are required to travel long distances over often unsafe roads. Christmas and Gross (2019), in their recently published “Analysis of the Introduction of Digital Nursing Licensing Examination in Ghana, follow that “the process will not be fair to the hard to reach schools, which are coincidentally the most resource-limited institutions. [...] The students who are in hard to reach schools will have to travel long distances, seek for accommodation, try to get used to an unfamiliar environment while[sic] preparing and writing the examination in a computer laboratory they have not used before”.

A more significant problem of the current practice is lack of exposure to computers before taking the online licensing examination. This implies issues of fairness and, more generally, a risk that ICT is introduced in the health training institutions sector which emphasizes procedural efficiency rather than empowerment of both students and lecturers.

The current plan of the NMC merely foresees that students get the chance to take part in a mock examination<sup>6</sup>. This appears unlikely to be carried through in the case of schools located far away from an NMTC with an accredited computer lab. Moreover, available evidence suggests that training provided to both students and tutors is insufficient.

The implementation of online licensing examinations in Ghana has been enabled by a grant from the government of the Netherlands. Once this source of funding will dry out, i.e. after the end of the current NICHE project in 2021, the system of health training institutions in Ghana will need to find novel ways to complete and maintain the task of equipping the country’s many NMTCs for participation in online examinations. At the time of writing there appears to be no plan on the part of the NMC how this challenge can be met.

Against this background, the experience of SONAM, the largest NMTC in the Volta Region, demonstrates how an alternative route might look like. The implementation plan for eLearning and mLearning at SONAM includes full integration of online modes of learning within the day-to-day

---

<sup>6</sup> “The Council would collaborate with various schools for candidates to try their hands on the demo questions in their schools computer labs before the main exams takes off” Source: <https://www.nmcgh.org/t3f/en/faq-online-examinations> (retrieved 2020-01-22).

training practice of students and lecturers. The Moodle system is already used extensively for conducting quizzes and exams throughout the semester, which is a means for providing students with the exposure to computers needed for the workplaces of the future. Additional, innovative ways to continuously train students and staff in the effective use of ICTs are currently being discussed.

Moreover, the plan of SONAM and HITA foresees that the School will transfer expertise in eLearning and mLearning to the surrounding NMTCs, many of which are in very peripheral locations. Rather than simply opening up SONAM's computer lab to the students of other schools, the plan is for SONAM to act as a centre of excellence. Its role will be to empower all NMTCs, their staff and students to exploit the full potential of online modes of training and learning.

The piloting of low-cost means of equipping second tier NMTCs with the required ICT infrastructure is an integral part of this plan. In this regard, low cost can mean to make optimal use of existing ICTs including students' smartphones.

# Sources

Christmals, C.D. and Gross, J. (2019) 'An Analysis of the Introduction of Digital Nursing Licensing Examination in Ghana', *International Journal of Caring Sciences*, 12(3): 1892-1897. Retrieved from: [www.internationaljournalofcaringsciences.org/docs/63\\_christmals\\_special12\\_3.pdf](http://www.internationaljournalofcaringsciences.org/docs/63_christmals_special12_3.pdf)

Erkert, T., Gareis, K., Glätzner, M. and Kaba, R. (2018) 'mLearning in Nursing and Midwifery Education: Are Ghana's Students Ready?', paper presented at IST-Africa 2018, Gaborone, Botswana. URL: [www.researchgate.net/publication/325645454\\_mLearning\\_in\\_Nursing\\_and\\_Midwifery\\_Education\\_Are\\_Ghana's\\_Students\\_Ready](http://www.researchgate.net/publication/325645454_mLearning_in_Nursing_and_Midwifery_Education_Are_Ghana's_Students_Ready)

Ghana News Agency (2018) 'Nursing and Midwifery Council conducts online students' examination', online article, 4 September, URL: [www.ghanaweb.com/GhanaHomePage/NewsArchive/Nursing-and-Midwifery-Council-conducts-online-students-examination-682259](http://www.ghanaweb.com/GhanaHomePage/NewsArchive/Nursing-and-Midwifery-Council-conducts-online-students-examination-682259)

Graphic Online (2019) '1073 prospective midwives complete online licensing examination', online article, 25 March, URL: <https://www.graphic.com.gh/news/general-news/ghananews-1073-candidates-prospective-midwives-complete-online-licensing-examination.html>.

Nursing and Midwifery Council of Ghana (NMC) (2019) 'List of Approved Institutions and Programmes – December 2018', [www.nmcgh.org/t3f/en/documents-forms?download=32:december-2019-accredited-schools&start=20](http://www.nmcgh.org/t3f/en/documents-forms?download=32:december-2019-accredited-schools&start=20)

Nyante, F. (2018) 'Developing and Implementing Online Licensing Examinations for Nurses and Midwives in Ghana', paper presented at eLearning Africa conference, Kigali, Rwanda, 26-28 September. URL: [www.nmcgh.org/t3f/en/documents-forms?download=31:developing-and-implementing-online-licensing-examinations-for-nurses-and-midwives-in-ghana](http://www.nmcgh.org/t3f/en/documents-forms?download=31:developing-and-implementing-online-licensing-examinations-for-nurses-and-midwives-in-ghana)

Osman, H. (2017) 'Nursing Students' Experience with Information Literacy Skill', *Yangtze Medicine*, 1: 157-168. URL: <https://doi.org/10.4236/ym.2017.13016>