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Implementing Digital Education Strategy Phase II Report (Deliverable D4.2)

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Project consortium

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- Center of Excellence in Educational Innovation, Tallinn University (TLU), Estonia.

- Information and Communication Technology Education, University of Education, Winneba (UEW) Ghana.

- Mathematics and ICT Education, University of Cape Coast (UCC), Cape Coast, Ghana.

Notices

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- University of Education, Winneba (UEW) -Partner

Executive Summary

The rapid advancement of digital technologies has had a profound effect on higher education globally, including in Ghana. The University of Cape Coast (UCC) and the University of Education in Winneba (UEW), both located in Ghana, recognizing the importance of digital literacy in enhancing research, teaching, and learning, have been at the forefront of this transformation in the country.

This report looks closely at both UCC and UEW digital literacy and infrastructure development. Given the issues surrounding the COVID-19 epidemic, both organizations have made tremendous progress in their digital transition. The current infrastructure is also described in terms of the current levels of digital competency and infrastructure and concludes with some recommendations for future investment to further increase digital literacy and educational outcomes. A major issue emerging from this review is that while considerable progress has been made to improve the digital infrastructure and uptake of digital technologies in both universities, more investment is required to develop home-grown technologies that suit the

unique needs of Ghana and also ensure system-wide utilization of existing infrastructure and support systems

1.0 Purpose and Scope
This report intends to analyse the current infrastructure, assess instructors' current digital competencies, chronicle the digital changes at UCC and UEW, and offer recommendations for future investments. Surveys, interviews, and assessments of the infrastructure carried out at both universities served as the basis for this report.

2.0 Digital literacy and infrastructure changes
a. University of Cape Coast
The former Computer Centre was founded by the UCC in 1975 as a departmental service unit. From then on, this became the Directorate of Information and Communication Technologies (DICTs), which was founded in 2015 by the UCC. The purpose of DICTs is to leverage ICT to support teaching, learning, research, and administrative activities. DICTS has four sections and units namely: E-learning and Knowledge Management, Network and Infrastructure Services, Training and Support Section and the Management Information Systems. Additionally, several policies developed/under review to ensure that UCC leverages the opportunities presented by the rapid advancement in this area. Over the previous five years, UCC has experienced a substantial digital shift. Important advancements consist of:

- ✓ Setting up of centres/sections/units: Post-COVID, the UCC has witnessed the setting up of a Centre for Computational Thinking (CCT) which houses a 20-node computational cluster and a computer laboratory with twenty (20) computers for use by students and faculty for the purposes of teaching, learning and research. There is also the Network and Infrastructure Section which used to be called the Computer Centre which is a dependable lighthouse providing the appropriate Information Communication Technology (ICT) services, computer information and computer management skills to the university and its surrounding communities

- ✓ **E-learning Platform**: UCC has a state-of-the-art Learning Management System (LMS) in place that facilitates blended learning, online courses, and virtual classrooms. When the institution switched to online instruction during the COVID-19 pandemic, this approach was essential. At the moment, the University's policy on the use of online platforms is 70:30, that is 70 percent face-to-face and 30 percent online. It must be noted that digital technologies are one of the key thrusts in the recently launched UCC Strategic Plan further highlighting the importance the management of the university places on effective integration of digital technologies in all aspects of its operations.

- ✓ **Faculty Training Programs**: To help instructors become more proficient with technology, the institution organised several workshops on digital literacy. More than 70% of academic staff members have taken part in these initiatives. The Centre for Teaching Support and the Training and Support Section were instrumental in ensuring that all faculty in the University received training on how to use the LMS to teach and also assess students.

- ✓ **Expansion of Digital materials**: UCC has made investments in online databases and digital libraries, giving professors and students access to a multitude of scholarly materials. For example, UCC has in place JSTOR, IEEE Xplore, ProQuest, and Project MUSE that give scholarly materials to both staff and students.

b. University of Education, Winneba

Recent major developments in digital literacy and infrastructure at UEW demonstrate the institution's dedication to raising educational standards and remaining competitive in the digital era. The adoption of smart classrooms with interactive whiteboards, fast internet, and video conferencing capabilities are important initiatives that have made it possible to use more dynamic and engaging teaching techniques. Furthermore, with more than 60% of the faculty taking part in these seminars, the creation of a Digital Literacy Unit has been crucial in educating staff and students on how to use digital technologies in the classroom. In addition, UEW has modernised its internet infrastructure to support these initiatives and provide dependable, fast connectivity on all campuses—including those located in remote places.

3.0 The current state of digital literacy and infrastructure

A crucial component of contemporary academia is the infrastructure and level of digital literacy in educational institutions, which reflect the changing demands of students and teachers in an increasingly digital society. The efficacy of an institution's efforts to incorporate technology into its instructional practices is contingent upon two key factors: the faculty's degree of digital literacy and the infrastructure's suitability. In order to improve digital learning environments, this overview looks at how universities like UCC and UEW are addressing these issues. It highlights the advancements that have been made as well as the areas that still need work.

At UCC and UEW, the current condition of digital literacy and infrastructure demonstrates both notable advancements and enduring difficulties. At UCC, the vast majority of academic staff members are technically proficient, but there is a discernible lack of fluency with more sophisticated digital tools—only 40% (346 out of 864) of them feel confident using them. About half of educators (432) routinely include digital aspects into their instruction, indicating a growing trend in the pedagogical integration of digital resources.

Similarly, there has been a noticeable increase in the use of digital tools for research at UEW, where 75% (280 out of 400) of faculty members are fluent in fundamental digital abilities. The incorporation of digital pedagogies is further advanced by the introduction of smart classrooms, which align with the trend of 55% of instructors using digital resources in their instruction. To fully realise the promise of their digital infrastructure, both organisations must overcome the barrier of improving digital literacy even with these developments.

4.0 Infrastructure at UCC and UEW

A crucial component of contemporary academia is the infrastructure and level of digital literacy in educational institutions, which reflect the changing demands of students and teachers in an increasingly digital society. The efficacy of an institution's efforts to incorporate technology into its instructional practices is contingent upon two key factors: the faculty's degree of digital literacy and the infrastructure's suitability. To improve digital learning environments, this overview looks at how UCC and UEW are addressing these issues. It highlights the advancements that have been made as well as the areas that still need work. The following are the strides made so far:

    a. University of Cape Coast
    ✓ **Internet connectivity:** UCC has invested (600,000.00 euros since 2020) in expanding its internet infrastructure, providing high-speed (25mb per user) Wi-Fi across all major campus areas. However, connectivity issues persist in some remote areas of the campus, as well as in affiliate Colleges of Education, Universities, and Campuses. UCC has also signed up to EDUROAM Services which makes internet accessible to both students and faculty, although coverage is currently not at 100 percent across campus.

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i. **Hardware and Software:** The university has equipped most classrooms with projectors and basic multimedia equipment. In all, there 79 lecture halls and out of these are 69 of them that are fully equipped with projectors and public address systems. Additionally, UCC provides faculty with access to essential software, although there is a need for more advanced tools for specialized disciplines. DICTs offers the following services; Ncomputing technology, Outdoor LED Billboards, and Campus Access Network.
ii. **Digital Libraries:** UCC's digital library has become a critical resource, offering access to a wide range of academic journals, e-books, and research databases. These resources can be accessed both on and off campus by all students and faculty with dedicated librarians offering both in-person and online support.
iii. **LMS:** Numerous teaching activities, including online lectures, debates, and assessments, are supported by UCC's LMS. The LMS was very helpful during the COVID era with the university moving all teaching online after training all faculty on the use of the platform. Students also received training with videos developed to provide further tutorials.

b. **University of Education, Winneba**
i. **Internet Connectivity:** UEW has significantly improved its internet infrastructure, with reliable high-speed Wi-Fi now available on all campuses. This has facilitated the effective use of online resources and digital tools in teaching.
ii. **Smart Classrooms:** The introduction of smart classrooms has been a major infrastructure upgrade, supporting a more interactive and engaging learning environment.
iii. **LMS:** UEW's LMS supports a wide range of teaching activities, including online lectures, discussions, and assessments. Though it could be improved, faculty and students like the system.

5.0 Outlook for Future Investment

The review has revealed one key thing which is that both universities are responsive to change as evident from the massive investments in digital technologies and staff over the years. Not only is the infrastructure being expanded but also, there are sustained efforts to develop and integration of digital technologies in all courses and programs. This push is commendable. However, there is a need for more investment, both human and infrastructure, considering that digital technologies change rapidly with new technologies.

a. **University of Cape Coast**
  α. **Infrastructural requirements**
i. **Upgrading Internet Connectivity:** Addressing connectivity gaps, particularly in remote areas of the campus, should be a priority. Here the remote campuses refer to our distance learning centres as well as affiliated Colleges of Education.
ii. **Expanding Digital Resources:** Investing in more advanced digital tools and software will be critical, particularly for research and specialized disciplines.
iii. **Enhancing Digital Literacy Training:** UCC and UEW would consider mandatory ongoing digital literacy training for faculty to ensure continuous improvement in digital competencies. This is already ongoing as a result of the support from the European Commission through the GOT Project.
iv. **Equipping Technical Support Team:** Both universities intend to employ and equip more technical support personnel so that they can support instructors as and when they have challenges.

b. **University of Education, Winneba**

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β. Infrastructural requirements

i. **Expanding Smart Classrooms:** Given the success of the initial smart classrooms, UEW is poised to expand this initiative to cover more departments and campuses.

ii. **Improving Technical Support:** As more instructors adopt digital tools, the university will need to enhance its IT support services to assist with technical issues and training.

iii. UEW would invest in research to better understand the digital literacy needs of its faculty and students, enabling more targeted interventions.

6.0 Recommendations

i. **Establish a Digital Innovation Hub:** Create a space dedicated to exploring and experimenting with new digital tools and teaching methods.

ii. **Increase Industry Collaboration:** Partner with technology companies to give faculty access to cutting-edge tools and platforms.

iii. **Develop a Comprehensive Digital Literacy Strategy:** This strategy would outline clear goals, timelines, and resources for enhancing digital literacy across the two universities.

iv. **Strengthen Partnerships with Global Institutions:** Collaborating with international universities and organisations can provide valuable insights and resources to support UCC and UEW's digital transformation.

7.0 Conclusion

At the Universities of Cape Coast and Winneba, there has been a notable advancement in the development of digital literacy and infrastructure. Both organizations need to keep spending money on digital tools, training, and support systems if they want to remain competitive in a world that is becoming more and more digital. Together, UCC and UEW can close current gaps and build on prior successes to enhance our educational offerings and better prepare our faculty and students for the future. This will mean that the capacity of faculty is continually developed so they can develop homegrown technologies and reduce the purchase of foreign technologies. The setting of a digital incubator would be a good step in this direction. Also, there should be regular training for faculty to sustain the gains made during the COVID-19 pandemic and ensure apathy does not set-in.

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