Journal of educational equipment: Education management, Volume 1, Issue 282 (February 2023)
ISSN 1859 - 0810

Applying the effective digital transformation tools in training at HUST in Covid19 era

Nguyen Dac Trung[1], Nguyen Thi Thu Giang[2], Nguyen Thi Huong Giang[1]
[1] School of Engineering Pedagogy, Hanoi University of Science and Technology
[2] Network Information Center, Hanoi University of Science and Technology
Received: 04/1/2023; Accepted: 6/1/2023; Published: 9/1/2023

Abstract: *The paper introduces a system of criteria to assess the level of development toward the digital university of a higher education institution and demonstrates this based on the results of the digital transformation in the management and training process at Hanoi University of Science and Technology. Based on the characteristics and components of a digital university, the research team has designed survey criteria with the aim of developing Hanoi University of Science and Technology into a digital university. The criteria were built into an online survey by using Google Forms to collect feedback from students who took part in the Soft skill course in the first semester of the school year 2020-2021 at Hanoi University of Science and Technology (HUST). Specifically, the Soft Skill course was run as a blended learning format based on several digital transformation tools of HUST such as the student information system (SIS), learning management system (LMS), Microsoft Teams, and the online-examination system. The survey and evaluation results of this research show that HUST achieved the starting point according to the Assessment Model for Digital University*

Keywords: *Digital Transformation #Effectiveness of Digital University #Learning Management System*

I. Introduction

Digital transformation is referred to as the overall and comprehensive change of individuals and organizations in general (enterprises, corporations, etc.) in terms of lifestyle, working methods, and production-based digital technology platforms [1]. Digital transformation has quickly become a top priority for many organizations and businesses operating in different fields. the effectiveness of digital transformation is increasingly bringing great value to the organization owner, its customers as well as society. Hanoi University of Science and Technology considers digital transformation as one of the breakthrough solutions for fundamental innovation and international integration, especially digital transformation in training. Thematic resolution of the 15th Party Executive Committee on the digital transformation of HUST has identified the following points of view: Digital transformation is an urgent issue, a particularly crucial factor creating the sudden development of HUST. Actually, in training, the effective applications at HUST had seen considerable growth, particularly since 2019 with the onset of the COVID-19 pandemic, which has limited face-to-face teaching methods. Lecturers and students have had to adapt to the restrictions imposed on physical interaction and transform to online and synchronized learning forms which need support from digital transformation tools effectively. Following the trend of digital transformation, HUST puts the highest political determination to successfully convert arguments and become a "Digital University". Lecturers and students are at the center of the digital transformation process and are the most prioritized beneficiaries of the digital transformation of HUST. The digital transformation process at HUST has been implemented in the following main areas of work.

1.1. Digital transformation in training management

The management and training information system with information network infrastructure plays an important role in improving the efficiency of training information exploitation, and student management as well as promoting administrative reform of HUST. The management information system in formal university training has been built and put into use since 2007 to serve training under the K52 credit-based learning system. At the time of operation, the new training management software has some main functions such as: student database management, study registration, and graduation registration. However, due to the increasing number of student accounts, HUST has built a new information system, which is a training and student affairs portal at the

address ctt-daotao.hust .edu.vn. This portal provides a web-based interface to cater to a wide range of users for example faculty managers, students, parents, and off-campus users. The portal integrates a large amount of data related to training (undergraduate, and graduate learner's information) and student work at the university; integrates applications with lookup functions, training data extraction, and other services that are personalized according to user purposes. This application ensures availability and flexibility, allowing students to choose/register for their courses in order to accumulate credits appropriate for their future careers (on the dk-sis.hust.edu.vn). In addition, for staff and lecturers, HUST has also built a Teaching and Project Management System (https://qldt.hust.edu.vn/), which provides all information of each teacher, their scientific research works, published articles, classes in each semester, etc., It brings a flexible way for teachers to actively manage and use their private information more convenient. Moreover, student learning management system, and score management systems are crucial needed ones for support in training. The above systems are combined and operated by data integrating mechanism to ensure the smoothness of connection and sharing data from students to lecturers as well as educational managers.

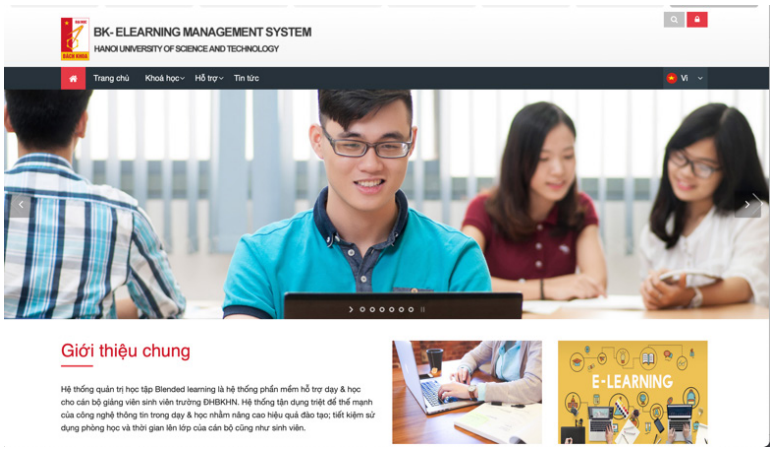

Fig. 2. Online learning management system at HUST

Besides digital transformation in training management, digital transformation in teaching and scientific research activities is also highly valued by Hanoi University of Science and Technology. A high-speed Wi-Fi network is covered throughout the school, helping staff and students connect to the Internet quickly and conveniently, helping staff and students increase their ability to study and work online. The system of online studios and classrooms has also been developed to meet the increasing demand for interaction between lecturers and students, sharing documents, meeting the needs of learning anytime, anywhere. The Information Network Center deployed the LMS/LCMS which is the online learning environment where lecturers and students can share make their online discussion sessions and share learning resources and online learning activities. With those available online learning systems, since 2017, HUST has decided to deploy a blended learning methodology to further diversify teaching forms, make the most of the campus' information technology infrastructure, and most importantly meet the flexible learning needs of students. Currently, most of the faculties in the school have courses on the online learning system and are taught in the form of Blended learning. The survey results at the end of each course have demonstrated the effectiveness of the new learning methods, as well as the online learning systems.

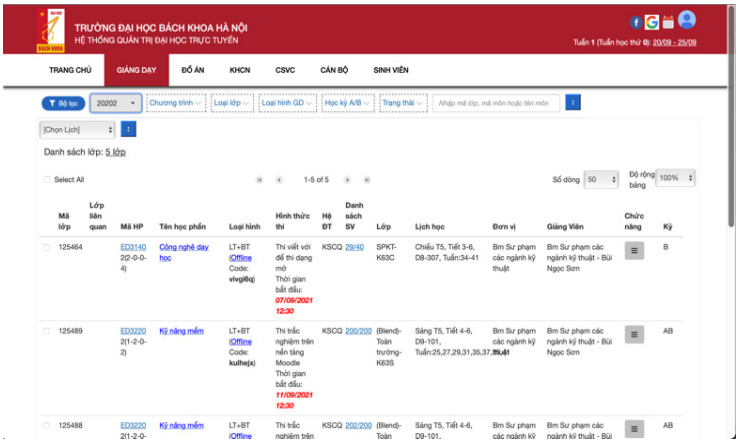

Fig. 1. Online Management System of Hanoi University of Science and Technology

1.2. Digital transformation in teaching and scientific research

Additionally, all students and school staff are provided Office 365 accounts, which serve several

license-efficient online tools such as Outlook, and Planer. In which, lecturers can build easily their synchronous online courses via the MS Teams platform. Specially, In the Covid-19 era, an online assessment system was quickly deployed to support a hundred of thousands of online exams with the Safe Exam anti-cheat tool. All of the above applications have contributed to ensuring that the teaching and learning activities of the whole school are deployed smoothly in the context of the Covid epidemic, and at the same time increase the initiative, flexibility, and adaptability to many different learning conditions for the whole system.

II. Applying an effectiveness of Digital University Model in training at Hanoi University of Science and Technology

2.1. Survey criteria

HUST has been equipped with the following facilities, infrastructure, and application of information and communication technology:

I.1 Multimedia classroom system with basic information, sound, and image presentation equipment (projector, screen, speaker system, microphone)

I.2 System of computer rooms

I.3 Laboratories and workshops

I.4 Traditional libraries (only providing printed books and learning materials) have corresponding library management software systems

- HUST has applied information and communication technology for teaching and training

I.5 Portal (website), email system of the school

I.6 Student management software system (study registration, learning results)

I.7 Electronic training portal providing Online, Blended Learning courses of Faculties/Institutes in the University

I.8 Training management software system (teaching assignment, timetable, scientific research statistics...) for teaching staff

I.9 School-wide wireless Internet access system

I.10 Computer-based test-assessment system

I.11 E-library providing domestic and international documents and databases for teaching and scientific research

I.12 Types of digital learning materials (electronic lectures, teaching films, teaching software, digital simulation)

I.13 Basic and specialized software (copyrighted) for specialties such as Office 365, software to support Internet collaboration (MS Teams, Zoom...), calculation and simulation software, design, graphic processing…

2.2. Survey results

The percentage of students who have used digital university-oriented information technology equipment and infrastructure reflects the level of student participation according to digital university criteria:

Criteria	Frequency	Percentage (%)	Hierarchy of use by learners (No. 1: >90%; No. 2: 80%-90% No. 3: 70%-80%;No. 4: 60%-70%)
I1	397	95.89	1
I2	310	74.87	3
I3	336	81.15	2
I4	310	74.87	3
I5	382	92.27	1
I6	369	89.13	2
I7	375	90.57	1
I8	316	76.32	3
I9	307	74.15	3
I10	253	61.11	4
I11	255	61.59	4
I12	258	62.31	4
I13	359	86.71	2

It can be seen that HUST has simultaneously deployed hardware systems (Internet network, learning content development studios...), software systems (Moodle learning management system, Office 365 applications such as Teams Meeting..., and online examination system), and at the same time, have developed teaching programs and forms (online teaching, teaching Blended learning) to meet many different teaching conditions and requirements. However, the level of use of learners is not uniform.

In the past time, all HUST staff and students are always ready to participate in the digital transformation process, orienting to build a smart university and a smart digital university. This is not only reflected in the University's increased investment in infrastructure and technology for training but also in fostering activities using online learning systems for teaching staff. students, deploying teaching and learning in different forms based on information technology, deploying the semester exam through the online exam support system...

(Xem tiếp trang 94)

cần chú trọng hơn nữa tới công tác xây dựng ngân hàng câu hỏi dùng cho kiểm tra, thi; ngoài việc cập nhật, chỉnh sửa ngân hàng câu hỏi theo kế hoạch chung của nhà trường, giảng viên cần chủ động cập nhật đánh giá ngân hàng câu hỏi để điều chỉnh câu hỏi phù hợp. Khắc phục tình trạng giảng viên đưa quan điểm chủ quan của cá nhân trong khâu làm đề thi, đồng thời yêu cầu giảng viên cùng thảo luận, phản biện và xây dựng hệ thống ngân hàng câu hỏi dùng chung trong giảng dạy môn Tin học tại nhà trường.

3. Kết luận

Hoạt động kiểm tra, đánh giá kết quả học tập của học viên là một khâu quan trọng trong quá trình đào tạo. Để đảm bảo kiểm tra, đánh giá người học được chính xác, khách quan thì công tác xây dựng, sử dụng, quản lý ngân hàng câu hỏi là cần thiết. Ngoài ra, giảng viên trong đơn vị cần chú trọng làm tốt công tác xây dựng, sử dung, quản lý ngân hàng câu hỏi, tham gia tích cực, có hiệu quả vào việc nâng cao chất lượng công tác giảng dạy, nghiên cứu khoa học của nhà trường, góp phần giúp công tác kiểm tra đánh giá trở nên khách quan, minh bạch, chính xác, đáp ứng yêu cầu công tác giáo dục và đào tạo của nhà trường trong tình hình hiện nay./.

Tài liệu tham khảo

1. Ban chấp hành TƯ (2013), *Nghị quyết số 29NQ/TW ngày 4/11/2013 của BCH TW Đảng Khóa 11 về "Đổi mới căn bản, toàn diện giáo dục và đào tạo"*; Hà Nội

2. Nông Duy Trường, *Dạy học theo Benjamin Bloom, [trực tuyến]*. Đọc từ: http://icevn.org/vi/node/994 [truy cập ngày: 16/7/2010].

3. Đỗ Anh Dũng, Trần Thị Thúy (2020), *bài báo "Xây dựng hệ thống câu hỏi trắc nghiệm khách quan trong kiểm tra, đánh giá kết quả học tập học phần "tiếng anh 1" của sinh viên học viện cảnh sát nhân dân"*, Tạp chí Giáo dục - Học viện Cảnh sát nhân dân, Số 486, 9/2020)

Applying the effective digital transformation... *(tiếp theo trang 64)*

III. Conclusion

Digital transformation in higher education is not only the task of the school, or the state, but the responsibility of many stakeholders in the digital age. Digital transformation in higher education is not only an investment in digital technology infrastructure but also requires a drastic change in thinking, management, teaching and learning to adapt to the change in training technology. With the support of advanced technologies, there will be many breakthroughs in the field of teaching in the digital age, the concepts of Smart University and Digital University will gradually be realized through many different stages of development. Universities need to be determined based on the actual situation to prepare appropriate development strategies, especially the human factor, to ensure sustainability in this digital transformation. Through the above survey and evaluation results, it is possible to find that HUST achieved the starting point according to the Assessment Model for Digital University.

IV. References

[1] Ministry of Information and Communication, "Manual for Digital Transformation", Hanoi, 2018.

[2] D. C. Brooks and M. McCormack, "Driving Digital Transformation in Higher Education," EDUCAUSE, Louisville, June 2020

[3] K. Wetzel, B. Reinitz and S. Grajek, "7 Things You Should Know About Digital Transformation," Educause, 2018.

[4] K. Sandkuhl and H. Lehmann, "Digital Transformation in Higher Education – The Role of Enterprise Architectures and Portals," in Digital Enterprise Computing, Bonn, Köllen Druck Verlag GmbH, 2017, pp. 49-60.

[5] V. D. N. Tikhomirov, "Development of strategy for smart University," in Open Education Global International Conference, Banff, Canada, 2015.

[6] D. Rico-Bautista, C. D. Guerrero and C. A. Collazos, "Smart University: A vision of technology adoption," Revista Colombiana de Computación, vol. 22, no. 1. January – June 2021, pp. 44-55, 2021.

[7] V. Uskov, J. Bakken, A. Pandey, U. Singh, M. Yalamanchili and A. Penumatsa, "Smart University taxonomy: features, components, systems," in Smart Education and e-Learning, Springer, 2016, p. 3–14.

[8] C. Heinemann and V. L. Uskov, "Smart University: Literature Review and Creative Analysis," in Smart Universities Concepts, Systems, and Technologies, Springer International Publishing AG, 2018, pp. 11-44.