

Evolving Adoption of eLearning Tools and Developing Online Courses: A Practical Case Study from Al-Baha University, Saudi Arabia

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Abstract—eLearning or online learning has gained acceptance worldwide, particularly after the Covid-19 pandemic. Although the pandemic has forced the shift towards this learning mode, there is still a continuous need to improve instructors' cognitive and practical competencies to effectively design and deliver online courses. In this paper, a practical case study from Al-Baha University, a Higher Education Institution (HEI) in Saudi Arabia, is presented, showing the development stages of eLearning at the university and how effective utilization of eLearning tools through a structured methodology in a short time, with minimum resources, has helped to improve the teaching and learning experiences for both instructors and students at the university before the pandemic. Various standards and research techniques have been adopted to develop and assess the methodology and its viability of implementation in other higher education institutions. The findings show the methodology's effectiveness and how it helps Al-Baha University smoothly adapt to the online shift at the onset of the pandemic. The methodology is presented to and gained acceptance and recommendation for application in other HEIs in Saudi Arabia from the committee of eLearning and distance education deans in Saudi Universities in March 2023. It also receives the Anthology Middle East award for community engagement in November 2023.

Keywords—eLearning; ICT competencies; Higher Education Institutions (HEIs); Learning Management System (LMS)

I. INTRODUCTION

A commonly accepted definition of eLearning is challenging to find [1], [2], yet it can be described as the utilization of different modes of technological tools for the purpose of education, whether these tools are web-based, web-capable or web-distributed [3]. Online learning is a term commonly used to describe education that occurs only via the web without face-to-face contact [3]. With various eLearning adopted terms and styles, it is broadly accepted among academic institutions and across all educational fields [4], [5].

More recently, due to the Covid-19 pandemic at the end of 2019, educational institutions had to move from conventional learning to digital and online learning as part of the health crisis management [6]. Although eLearning and its tools and practices were widely accepted around the globe before the pandemic, as previously stated, many Higher Education Institutions (HEIs) and faculty members in many countries were not ready for the shift to online teaching once the

pandemic occurred [7]. The low level of experience among instructors in adopting new teaching formats and the time constraints to make the shift immediately were affecting the readiness of these institutions [8]. This has led many HEIs to speed up the process of adopting eLearning tools without structured long-term planning [9].

The role of teachers in schools and instructors in HEIs during the pandemic was significant to ensure the continuity of teaching and learning [10]. Recent research shows that instructors in HEIs after the pandemic have appreciated blended and online learning, which allows them to combine the strengths of these teaching styles with the face-to-face style [9]. Jelinska et al. [11] pointed out that teachers with prior experience in dealing with online teaching tools were the best at coping with the challenges faced during the transition of the pandemic and were the most engaging. Similarly, Divjak et al. [12] state that instructors who had prior experiences adopting innovative teaching styles, such as flipped classrooms, before the pandemic had more successful experiences with online teaching implementation during the pandemic. However, instructors' adoption of online tools in HEIs before the pandemic was not pervasive [8]. This has significantly affected their experiences with online teaching during the shift to online mode. The focus should then be on continuous investment and enhancement of Information and Communications Technology (ICT) and eLearning competencies of instructors in HEIs to ensure long-term adoption and adaptation of different teaching and learning styles in HEIs. König et al. [13] emphasize the importance of professional development of digital competencies for teachers to adapt to online teaching. Gameil et al. (2023) [14], in their study findings, pointed out that huge investments must be made to train teachers to improve their instructional designing competencies in terms of cognitive and practical perspectives. They highlighted the issue that employing digital learning platforms after the pandemic requires paying more attention to improving the skills of teachers to cope with the radical changes in the teaching landscape.

Similarly, Svetec et al. [15] state that although instructors in HEIs realize the importance of digitalization support, they are not fully aware of the significant role of digital technologies in enhancing teaching and learning experiences. The enhancement of these experiences and the ability to reach a high level of quality in education are common strategic objectives in HEIs that are sometimes misaligned with

available technologies and the actual roles of instructors in these institutions. Jans (2009) [16] also states that teachers and lecturers may have learned and worked with many hardware and software tools; they, however, still require more didactical skills on how to use Learning Management Systems (LMSs) effectively, and longer courses are required to improve their eLearning competencies. According to Jans (2009) [16], eLearning and blended learning tools can only be learned by experimenting with them. Alshammari (2020) [17] also investigated instructors' behavioral intentions to use LMSs in a higher education institution in Saudi Arabia through several factors, such as age, gender, experience, etc., and found a causal relationship between experience and behavioral intention of LMS usage.

This practical case study paper describes a methodology implemented at a higher education institution in Saudi Arabia to elevate the usage of LMS through structured development and delivery of online courses while considering the enhancement of instructors' ICT and eLearning competencies. The methodology is developed following the framework devised by the authors and introduced in the paper [18]. In short, the framework consists of seven iterative stages that assist HEIs in elevating the usage of eLearning technologies by adopting them systematically, ensuring the involvement of related organizational components from alignment and Enterprise Architecture (EA) perspectives.

The following sections in this paper present background information about eLearning in Saudi Arabia in general and at Al-Baha University in particular. Then, the problems that motivate developing the structured approach to elevate the usage of eLearning technologies and develop and deliver online courses are revealed following the framework of Alzahrani et al. (2023) [18]. After that, the approach and its application and findings are described and discussed. Final thoughts and future work are stated by the end of this paper.

A. eLearning in Saudi Arabia

One of the fundamental characteristics of the HE system in Saudi Arabia is that it is centralized in terms of control and educational support [19]. This means that the Ministry of Education (MoE) and several specialized quality assurance and assessment centers are responsible for planning, coordinating, and supervising the kingdom's higher education sector. However, in recent years, the HE system has undergone tremendous reforms, unifying all efforts toward achieving Saudi Vision 2030 [20].

During the last two decades, the government of Saudi Arabia has invested enormously in ICT and digital transformation. According to the Digital Government Authority [21], the cumulative investment size in digital transformation in Saudi Arabia from 2022 to 2025 is expected to reach 25 billion USD. These massive investments in digital technologies contribute towards achieving the government's strategic plan "Vision 2030", where Saudi Arabia aims to be a global technology hub. According to published statistics from [21], Saudi Arabia was ranked second worldwide in digital competitiveness by the European Centre, ranked eleventh among the G20 for digital governance by the Japanese WASEDA ranking, and ranked 1st in the ESCWA indicator for

the availability of digital services, and 19 agencies were awarded Enterprise Architecture Certification from the Digital Government Authority. Proudly, Al-Baha University was among these agencies. There is no doubt that Saudi Arabia has achieved these numbers regarding digital transformation and digital capabilities since it is the largest ICT market in the Middle East and North Africa (MENA) region [22].

The education sector, in particular, receives the largest segment of the government expenditure [22]. Statistics from the same authority show a 100% digital transformation of teaching and learning activities during the pandemic in schools and HEIs through available platforms of "Madrasti" and LMS. Over 350 million virtual classrooms were created during the pandemic, and similarly, large numbers for other activities, such as homework, discussion boards, online exams, etc., were achieved. All have been achieved through a cooperative approach from involved stakeholders and under direct supervision from the Ministry of Education (MoE) and according to the regulations and standards of the National eLearning Centre (NELC).

Abdulrahim et al. [22] state that research on online learning in Saudi Arabia emphasizes the importance of having a strategic direction for its implementation and ensuring that instructors are trained to design and deliver online teaching effectively. Moreover, course design and technology gaps are among the main limitations that face adopting digital learning in Saudi Arabia [23]. Similarly, Alharbi [24] indicates that although there is a broad acceptance of the usefulness of digital learning in Saudi Arabia, there is a lack of knowledge and skills among students and instructors.

B. eLearning at Al-Baha University

Al-Baha University is now 17 years old and was established in late 2006. It has 16 faculties spanning six different geographical areas covering the vast region of Al-Baha province (11,000 square km) southwest of Saudi Arabia. It has a current enrolment of 17748 students, 1536 instructors and 776 employees. The university offers 28 undergraduate programs, 17 master programs, and nine programs for higher diplomas. The number of students is increasing annually from only 13,793 in 2008 to nearly 18000 in 2023.

Colbran et al. (2013) [25] studied the adoption of educational technologies among Saudi universities. They found the lack of IT infrastructure, training, and support, as well as websites and software problems, to be the main inhibitors of the successful adoption of educational technologies in the country. However, Saudi Universities have been transforming dramatically in adopting digital technologies along with the enormous investments and support from the government, especially during the last five to eight years. For example, since 2016, Al-Baha University has undergone tremendous changes in adopting and embracing digital technologies and providing services to its key stakeholders, namely students and instructors. By late 2018, the transformation had extended to reform the utilization of eLearning tools at the university after conducting a gap analysis and being aware of the challenges as described next.

The following sections are arranged in the following manner: First, the issues that drive the development of structured approaches to improve the use of eLearning technologies and the creation and delivery of online courses are discussed. Then, the approach is explained, along with its application and findings. Finally, concluding thoughts and future work are presented.

II. AWARENESS OF THE PROBLEM

Following the proposed framework of Alzahrani et al. (2023) [18], it states that being aware of the challenges that face underutilization of eLearning technologies and linking them with the strategic vision and objectives of HEIs are crucial steps towards effective and continuous usage of these technologies by involved stakeholders. It also suggests having an ecosystem to drive eLearning projects to realize strategic goals and assist in attaining them.

Al-Baha University -similar to other public universities in Saudi Arabia- was given a quota of thirty thousand licenses from the Ministry of Education (MoE) to access an LMS in 2012. This number of licenses is renewed every five years through a national agreement initiative to facilitate and spread the adoption of eLearning tools among students and instructors in these universities.

Although the number of students and instructors at Al-Baha University has never reached this number, the MOE was generous in providing more licenses for any expected future growth in the number of users. Surprisingly, the number of active users using the LMS was less than 0.5%, including students and instructors. This number was revealed in the middle of a running semester in December 2018. The number of registered students and instructors was close to 20000, interacting through 6500 study sections. This number was considered a wake-up call for the university and its management to start a new era of adopting and utilizing eLearning tools effectively.

A gap analysis was conducted to examine early adopted approaches that the university has carried out to embrace the adoption of eLearning tools. The outcomes revealed that the university has:

1) *Fifty-five* developed Electronic Courses (eCourses) that were invested in and transformed from conventional courses to eCourses from 2013 to 2015, following instructors' preferences and available content. Some of these developed eCourses are used only once and never used afterward. Others are used two or three times and similarly put on the shelf. This happens due to the absence of development standards and the intensive customizations applied to these eCourses. Like many other universities in the region during the early 2000s, converting traditional courses to eCourses was the mainstream regardless of its drawbacks [26].

2) *Very limited* attempts to adopt eLearning tools with currently available LMS.

3) *High* resistance to change among students and instructors with negative attitudes towards eLearning.

4) *Many* training sessions and workshops were conducted to explain the functionalities and tools of the LMS, but the follow-up was extremely weak, so what has been learned usually goes missing with less practice in place.

Taking these outcomes into consideration, an eLearning ecosystem named 'Rafid' is created, which consists of a set of components that are linked to the strategic goals of Al-Baha University, aiming to have a holistic transformation and better utilization of eLearning tools at the university.

III. RAFID ECOSYSTEM

"Rafid" is an Arabic word translated as "assistant/ helper/ supporter." It appeared everywhere at Al-Baha University in December 2018 in a ceremony attended and supported by the university's top management. It was a flag of change in students' and instructors' experiences about online teaching and learning. The word Rafid was used to indicate an eLearning ecosystem and change management approach that involves LMS, virtual labs, analytics tools, methodology for developing online courses, etc., that were all made available to assist, help, and support teaching and learning activities at the university (see Fig. 1). The message was clear to the main stakeholders of the university that Rafid ecosystem is found to assist you in your journey of teaching and learning at the university.

One of Rafid's ecosystem components is the Course Development Lifecycle (CDLS), which, in short, is a methodology that takes instructors on a journey of developing and delivering an online course through a structured approach. It was specifically designed to change the mindset of students and instructors towards embracing eLearning tools through teaching and learning processes.

Four stages are defined in the CDLC. These stages are presented in Fig. 2.

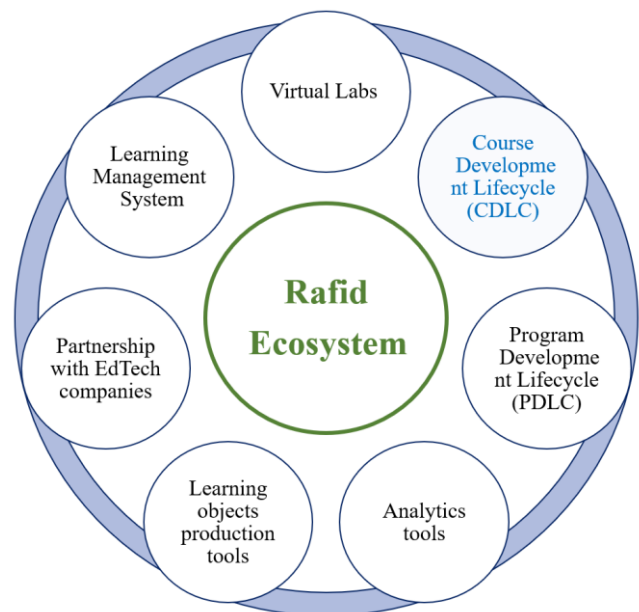


Fig. 1. Rafid ecosystem at Al-Baha university.

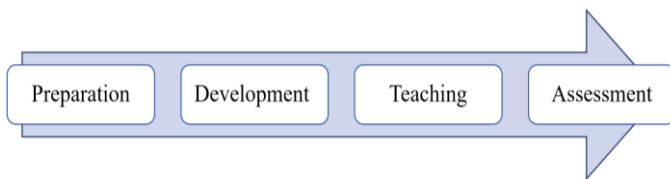


Fig. 2. Course Development Lifecycle (CDLC).

In the first stage, instructors are selected to participate in the process of CDLC based on a nomination process carried out by their faculties according to their ability to allocate 20 hours per week for this project. It was also recommended to nominate instructors who have preliminary ICT competencies such as accessing and browsing the Internet and using some of the main Microsoft Office programs such as Word and PowerPoint to some extent. Once all candidates are nominated, teamwork from the Deanship of eLearning and IT (DeIT), which specializes in course designing and multimedia development, is assigned. Systems and labs are also prepared, the project plan and timeline for course development and delivery are then set, and this stage ends up with a Service Level Agreement (SLA) contract signed by the DeIT from one side and the candidate (i.e., the instructors) from the other side to ensure the commitment of both sides.

In the second stage, participants develop their online courses following best practices and international standards such as Quality Matters (QM) standards for course design. Participants and assigned team members certified in online course design and delivery carry out this stage step-by-step. Assigned team members provide continuous feedback to participants to enhance every aspect of their online courses. This stage focuses on designing and enriching course contents with various resources, creating learning objects, assessment pools, and activities that ensure the engagement and collaboration of students in a standardized and effective learning environment. A master course template (i.e., an online course template structured according to best practices and standards of designing online courses made available for participants on LMS to have hands-on experience while developing their courses step-by-step). In other words, it facilitates developing standardized online courses through what is being learned from the methodology and the assigned certified team member. This course is then made available to students once the development and assessment of fulfilling the requirements are achieved. Several master courses are created and customized according to the nature of the content each faculty delivers at the university.

Once the course is developed, it is revealed to associated students, and the third stage, course delivery, begins. As the name of this stage indicates its objective, the participants deliver their developed online courses to students according to best practices that ensure the instructors' effective, coordinated, and assistant role in delivering online courses.

In the fourth and last stage, an assessment of previous stages is conducted by participants and students. Questionnaires and one-to-one interviews are carried out to find out the strengths and weaknesses of the project and the proposed methodology, more specifically.

Part of the methodology is an online course specifically developed and made available to participants on the LMS to go through the whole experience the students will receive once their online courses are available. This course also helps manage the entire project and lay down the foundations of eLearning and its tools by providing the required materials. Tasks mandatory for participants to complete are also done through assignment tools in the LMS. The project also activates tools such as wikis, discussion boards, groups, virtual classes, etc., where only questions, inquiries, and support needs are accepted and handled through these tools. This is to embrace usability and to show real-life utilization of such tools.

Online (must-attend) workshops provided to participants during the project include forming accurate and measurable learning objectives, designing roadmaps, enhancing and enriching course content with various multimedia content, creating question bank(s), importing and exporting questions, managing tests and assignments and finally delivering effective online courses.

Advanced (optional) online workshops are also offered to participants to expose them to different available techniques and tools that can help them streamline their course design and delivery. Examples of provided workshops include how to use video editing tools and how to build effective presentations through Adobe Suite, Camtasia, Xmind, MindMeister, Microsoft PowerPoint, Prezi, Canva, Kahoot, SurveyMonkey, Mentimeter, Google Docs, and Microsoft OneDrive.

IV. APPLYING CDLC METHODOLOGY

In one academic year, 99 instructors have participated and effectively experienced how to develop and deliver online courses following international standards in the field. This was done during two academic semesters in 2019, starting with 24 instructors and then moving to another 75. Participants were from 15 faculties and across different disciplines.

Upon completing the development and delivery of their online courses, they received recognition and certificates from the university president in a rewarding ceremony. They are then recognized as "Rafid ambassadors" in the change management process. They were passionate about passing the message to other instructors and voluntarily engaged in providing support to others in their free time without hesitation, especially during the Covid-19 pandemic.

Similarly, several students were trained to use LMS effectively as student users. We named them "Rafid Friends" and they also started spreading the message of how easy it is to use LMS and its tools to support the learning process at the university. They then provided help and support to other students whenever needed. These students voluntarily shoot videos of themselves using the system, designing brochures and infographics to spread awareness of the LMS and its tools. All these approaches and techniques were undertaken to change the mindset towards eLearning and its tools among students and instructors at the university.

V. OUTCOMES AND FINDINGS

Ninety-nine instructors who participated in this project were asked and thankfully completed an online open-ended

questionnaire and attended a 30-minute online interview each. These research tools were designed to receive feedback from the participants about the following:

1) An overview of the project in general and the level of satisfaction with the components and the defined stages of the developed methodology used in the CDLS project. This also measures the tendency to reengage in the same experiment again and to recommend it to other instructors, how the whole experiment was useful to them, and how it impacted the teaching and learning practices for them and their students. The outcomes are shown in Fig. 3 and measured on a 5-point Likert scale, with five being very satisfied and one very unsatisfied.

2) Participants have learned 46 skills during the project, which enhanced their ICT and eLearning competencies by adopting eLearning tools during the design and delivery processes undertaken throughout the project. The enhancement of ICT and eLearning competencies is not limited to these skills. However, they are drawn from best practices and international standards such as Quality Matters. From the participants' perspective, the importance of these skills is measured as a percentage, with 100% being very important. Fig. 4 shows the outcomes of this assessment (see Table AI in Appendix A for details of the skills).

3) The ability of participants to implement the learned skills mentioned in the previous point. Participants were asked to provide feedback about the easiness of implementing the defined set of skills. They all agree that they can implement each of the mentioned skills with a percentage close to 100%, except (providing online classes through the LMS to students, recording online classes that are being delivered through LMS

and making them available to students, allowing students to communicate through online classes that are created for them, 75%, 70, 60%) accordingly.

4) The ability of participants to teach/support others to carry out similar tasks. Participants confirm that they can teach/help others carry out similar learned skills with a percentage exceeding 95% for each skill.

The findings of the interviews conducted with the participants are illustrated in Table I, which outlines the advantages, disadvantages, and recommendations for improving the project of designing and delivering online courses through a developed approach.

A designed open-ended questionnaire is inserted in the developed ninety-nine courses after obtaining permission from the instructors who deliver them, and students who are registered in these courses are asked to fill out this questionnaire. The questionnaire consists of 40 questions asking students about their new eLearning experience. They were given three options against each question as to whether they agree to a great extent, to some extent, or a little extent. A total of 1800 responses were collected from students, and the outcomes are shown in Fig. 5 (see Table BI in Appendix B for details of the skills).

Students are also allowed to express their attitudes about the eLearning experience they have engaged in throughout the project through three open questions at the end of the questionnaire. Questions are focused on gathering feedback about the positive and negative aspects of the experiment as well as any recommendations for future improvements. Responses in each category exceed 100, but the most repeated answers are illustrated in Table II.

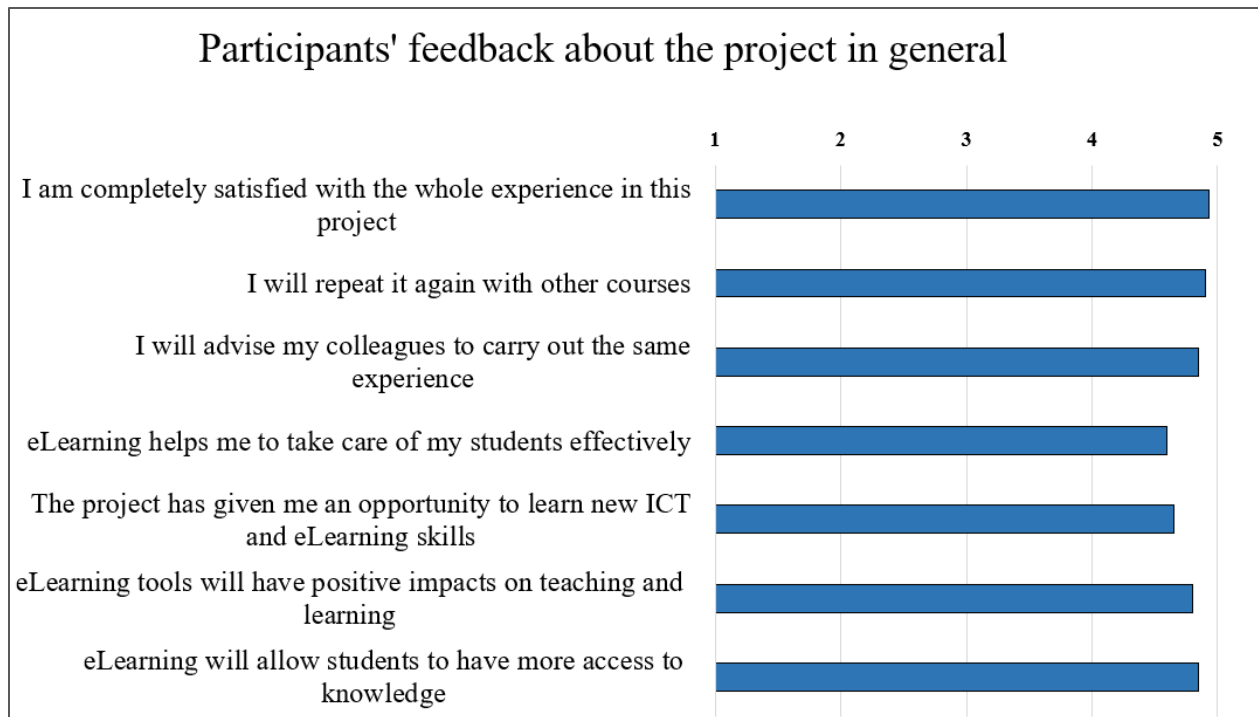


Fig. 3. Feedback about the project in general from ninety-nine participants.

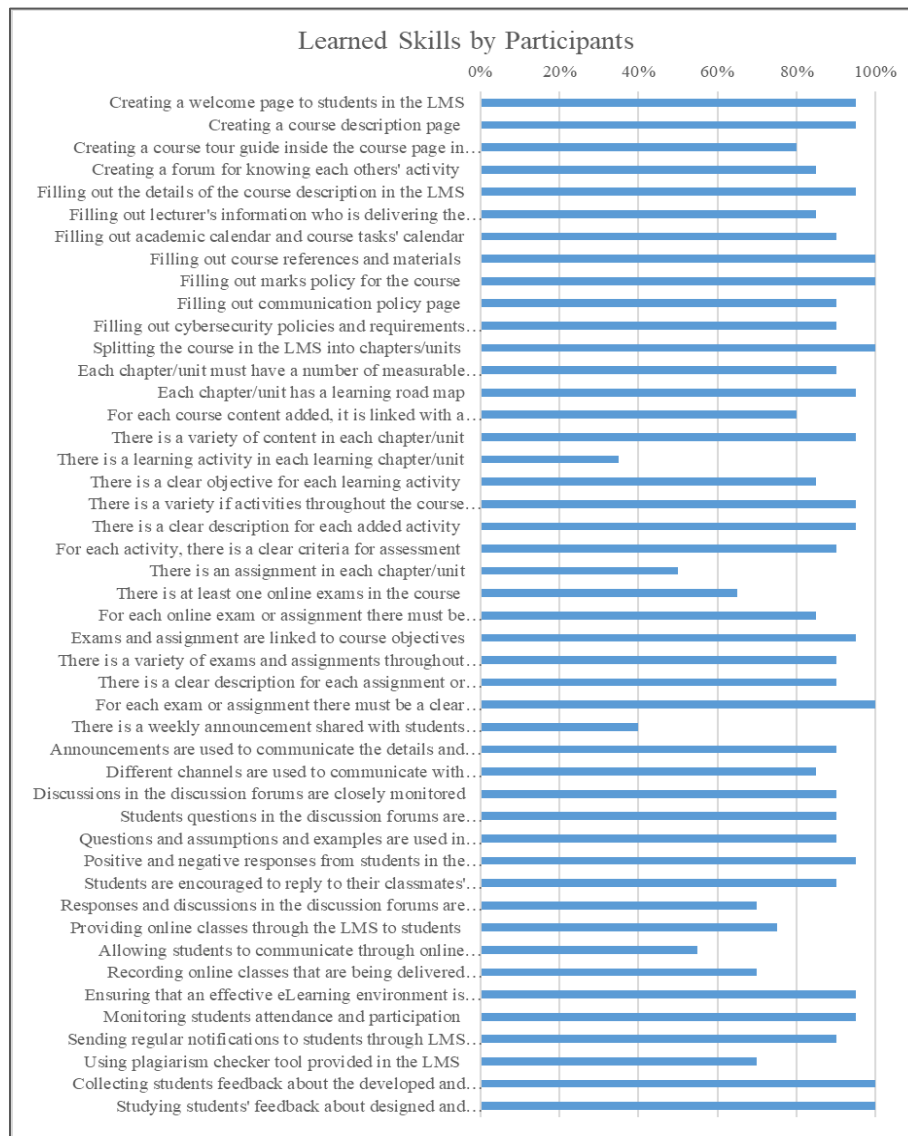


Fig. 4. The importance of each learned skill by participants from their perspective.

TABLE I. ADVANTAGES, DISADVANTAGES, AND RECOMMENDATIONS FOR IMPROVEMENTS FROM PARTICIPANTS

Advantages	Disadvantages
<ul style="list-style-type: none"> - Clarity of the training course and the flow of steps in each defined phase. - Quick responses and problem-solving from the assigned team members. - Accuracy of follow-up and assessment forms. - Quality of provided training and trainers. - The master course was generally excellent, saving participants time and effort in developing required courses and motivating some participants to continue with the project. - Realizing the benefit of having a road map for each chapter/unit to guide students in the learning flow of the chapter/unit. 	<ul style="list-style-type: none"> - Difficulty engaging in the project and its assignments at the beginning. - Difficulty attending courses and workshops with many assignments while having other administrative roles at the university. - Lack of sufficient labs to conduct online exams on some campuses. - Sometimes, some campuses have Internet and Wi-Fi coverage weaknesses. - There was not sufficient training for students. - Lack of visual content in the training course. - Insufficient time for required assignments. - Sometimes, it was challenging to deal with and modify the content inside the master template in the LMS, especially tables.
Recommendations for improvements	
<ul style="list-style-type: none"> - Considering the peculiarity of engineering materials. - The project tasks should begin a long time before the semester commences. - A separate e-exam system from LMS should be afforded. - Strengthening the training course with more videos so that it is more of a self-learning course. - Providing participants with a timetable that defines all steps that are required. - There should also be training for students on how effectively they can engage in online learning. - Allow more time for participants to submit the required tasks. - Providing access to virtual experiments and virtual labs in science courses. 	

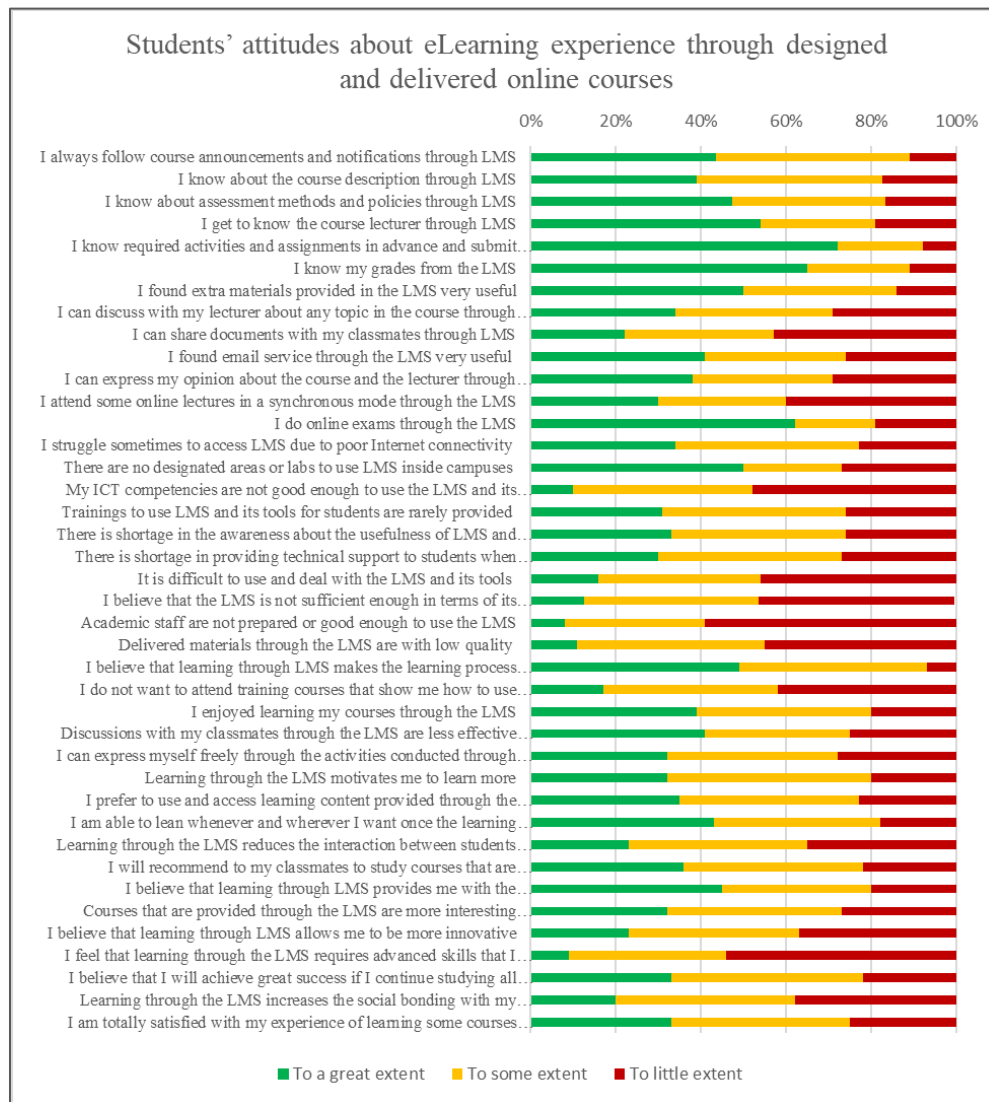


Fig. 5. Students' attitudes about the eLearning experience through designed and delivered online courses.

TABLE II. POSITIVE AND NEGATIVE ASPECTS AND RECOMMENDATIONS FOR IMPROVEMENTS FROM STUDENTS' PERSPECTIVE

Positive Aspects	Negative Aspects
<ul style="list-style-type: none"> - Easy access to course materials at anytime and anywhere. - Learning has become more flexible. - Easy access to assessments and grades. - Ease of communication and interaction with the course lecturer. - Faster in terms of understanding and accessing information. - Availability of multiple learning materials that support the main subject of study. - Learning through the LMS is fun and motivating for students, which increases students' interest in receiving more information. 	<ul style="list-style-type: none"> - Not all instructors use it. - The number of activities has increased exponentially. - Technical problems sometimes occur, such as (poor Internet connectivity). - Missing assignments and exam submission dates through the LMS due to less familiarity. - Lack of clarity regarding some assessments, such as (time for submitting assignments, grades, etc.). - Most online exams are based on objective questions, and there is no opportunity to express answers that the instructors can understand. - There are no alert notifications in the mobile application that are linked to the LMS. - Not all functionalities are supported or available in the LMS smartphone application.
Recommendations for future improvements	
<ul style="list-style-type: none"> - Enhancing the mobile application version of the LMS. - Forcing all instructors to use it in all courses at the university. - Provide students with some training, specifically regarding online exams. - Prepare locations with strong Internet connectivity for students to use the system effectively at the university campus. - Providing technical support 24/7. - Provide more training to some instructors to use the LMS effectively with students. 	

Different lessons were learned from the feedback of both students and instructors, and new opportunities were opened to enhance the project in general. Still, this project's most valuable outcome was spreading awareness of eLearning and its tools among students and instructors at Al-Baha University. From only 136 active users and 88 active study sections on the LMS in December 2018, the numbers have increased dramatically to reach 3573 users and 2888 study sections, respectively, after one academic year. This growing number of users represents 35% of the total number of users of the system and 44% of study sections that should be active on the LMS system at that time.

We have utilized the feedback received from this project and have transitioned to a higher-level project where we began designing and providing online courses based on an entire study program level. In this project, an agreement is signed with the dean of selected faculties to have a partnership project targeting the development and delivery of an entire program through their instructors and with the help and support of the specialized team from DeIT. This project confirms the importance of having an iterative approach in embracing eLearning technologies in HEIs, which is suggested in the framework of Alzahrani et al. (2023) [18]. Through this extended and enhanced project, 84 online courses were developed with the faculties of CS and IT (department of Computer Science) and the faculty of Business Administration (department of Marketing), 40 and 44 online courses, respectively. This also helped the growth of the number of users of the LMS, reaching 10163 active users and 3620 active study sections, representing 47% of total expected users and 55% of total active study sections at the university at that time. These numbers were reached before the pandemic of Covid-19 occurred, which helped the university enormously to cope with the healthcare restrictions and the compulsory shift to fully online learning. Instructors who have participated in this project and have been trained very well to use eLearning tools have become trainers to support others in effectively using eLearning tools during the pandemic. We have recorded 210 activities performed by 75 trained instructors during the early months of the pandemic. These activities range from providing videos on how to use eLearning tools to reaching a neighbor during the lockdown period and assisting them in setting up an online exam on the LMS.

Besides enhancing the ICT and eLearning competencies of the instructors at the university, which can be utilized to develop more courses, the developed courses are reusable. 6 of the 24 developed courses in the first semester are reused by the instructors who developed them. Seven other developed courses are voluntarily made available and reused by other instructors. In addition, more than 60 virtual classes were delivered by instructors during the first semester of the project, sending a message to other instructors throughout the university that delivering lectures can be done differently outside the university boundaries.

Before this project, male instructors used to travel to female students' campuses to deliver lectures through video conferencing dedicated rooms. These rooms are entirely locked now and have never been used after the pandemic due to the effectiveness of virtual classes through the LMS. During the

first semester of this project, it was also the first time official mid and final exams were carried out electronically through the LMS. This has never happened throughout the history of the university.

There was also a significant increase in the use of the university's official emails among students and instructors, along with the implementation of the project. This is because students receive emails about any new announcements from the LMS, and instructors were also advised to use official emails in all correspondence with students. The number of active email users at the university once the project started was only 2032. This number doubled in one semester only, reaching 3880 active email users.

It is important to note that some recent research argues that attending traditional in-person classes leads to better academic performance than taking online courses [27], [28]. Nevertheless, eLearning tools have transformed the education industry by significantly benefiting students and instructors. Adopting these tools has allowed learners to access information anytime, anywhere, and at their own pace. Meanwhile, instructors have been able to deliver interactive and engaging content to their students from the comfort of their homes. Although eLearning has many benefits, we firmly believe that in-person classes supported by advanced eLearning technologies offer the best possible education now and in the future. This is also supported by recent findings of Chen et al. (2023) [29].

VI. FINAL REMARKS

The perception of eLearning among Al-Baha University's students and instructors has been positively transformed through the implementation of this comprehensive project, as evidenced by increasing numbers. This project aims to have an effective holistic alignment of eLearning technologies with the strategic scene of Al-Baha University that seeks to enhance the quality of teaching and learning through ICT adoption. This is supported by the framework the authors suggest in Alzahrani et al. (2023) [18]. Although the quality of online courses delivered does not measure the success of this project, it has changed perceptions towards eLearning among critical stakeholders at the university. With the great support of the university's top management, the project was delivered as planned. However, the quality of delivered online courses is iteratively measured by the end of each project implementation cycle as a long-term plan for course evaluation and enhancement.

This project aims to promote the adoption of eLearning in higher education, with a particular focus on students and instructors, while considering other groups such as employees, senior individuals, and different age groups for future projects. The project discussed and the elaborated case study can benefit academic institutions seeking to engage instructors in online course development and delivery processes with minimal costs. All participants in the project at Al-Baha University have shown enthusiasm and a sense of responsibility for enhancing their students' learning and teaching experiences. Some members of Saudi universities' eLearning and distance education deans committee suggest implementing a monetary

reward system for project participants to achieve better results, especially after the pandemic.

VII. FUTURE WORK

While implementing our CDLC methodology during the Covid-19 pandemic, we observed the unique aspects of course design and delivery in the faculty of medicine. This is expected as the field of medicine requires specific attention due to the application of various teaching methods and the practical nature of the field. As a result, we studied ten different teaching methods and devised an approach for each method to shift it from face-to-face delivery to either blended hybrid or fully online teaching. We will present and discuss our findings in future work.

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APPENDIX A

TABLE AI. LIST OF LEARNED SKILLS BY PARTICIPANTS

1	Creating a welcome page to students in the LMS
2	Creating a course description page
3	Creating a course tour guide inside the course page in the LMS
4	Creating a forum for knowing each other's activity
5	Filling out the details of the course description in the LMS
6	Filling out lecturer's information who is delivering the course
7	Filling out academic calendar and course tasks' calendar
8	Filling out course references and materials
9	Filling out marks policy for the course
10	Filling out communication policy page
11	Filling out cyber security policies and requirements requested by cyber security department
12	Splitting the course in the LMS into chapters/units
13	Each chapter/unit must have a number of measurable learning objectives
14	Each chapter/unit has a learning road map
15	For each course content added, it is linked with a chapter/unit objective
16	There is a variety of content in each chapter/unit
17	There is a learning activity in each learning chapter/unit
18	There is a clear objective for each learning activity
19	There is a variety of activities throughout the course chapters/units
20	There is a clear description for each added activity
21	For each activity, there is a clear criteria for assessment
22	There is an assignment in each chapter/unit
23	There is at least one online exam in the course
24	For each online exam or assignment there must be specified objective(s)
25	Exams and assignment are linked to course objectives
26	There is a variety of exams and assignments throughout the course
27	There is a clear description for each assignment or exams included
28	For each exam or assignment there must be a clear criteria for assessment
29	There is a weekly announcement shared with students through LMS
30	Announcements are used to communicate the details and updates about the course
31	Different channels are used to communicate with students such as LMS and emails
32	Discussions in the discussion forums are closely monitored
33	Students' questions in the discussion forums are answered in acceptable range of time (24hrs max)
34	Questions and assumptions and examples are used in discussion forums
35	Positive and negative responses from students in the discussion forums are monitored
36	Students are encouraged to reply to their classmates' questions in the discussion forums
37	Responses and discussions in the discussion forums are summarized
38	Providing online classes through the LMS to students
39	Allowing students to communicate through online classes that are created for them
40	Recording online classes that are being delivered through LMS and making them available to students
41	Ensuring that an effective eLearning environment is maintained throughout the semester
42	Monitoring students' attendance and participation
43	Sending regular notifications to students through LMS and emails
44	Using plagiarism checker tool provided in the LMS
45	Collecting students feedback about the developed and delivered course
46	Studying students' feedback about designed and delivered course

APPENDIX B

TABLE BI. STUDENTS' ATTITUDES ABOUT eLEARNING EXPERIENCE THROUGH DESIGNED AND DELIVERED COURSES

1	I always follow course announcements and notifications through LMS
2	I know about the course description through LMS
3	I know about assessment methods and policies through LMS
4	I get to know the course lecturer through LMS
5	I know required activities and assignments in advance and submit them through LMS
6	I know my grades from the LMS
7	I found extra materials provided in the LMS very useful
8	I can discuss with my lecturer about any topic in the course through LMS
9	I can share documents with my classmates through LMS
10	I found email service through the LMS very useful
11	I can express my opinion about the course and the lecturer through questionnaires made available through LMS
12	I attend some online lectures in a synchronous mode through the LMS
13	I do online exams through the LMS
14	I struggle sometimes to access LMS due to poor Internet connectivity
15	There are no designated areas or labs to use LMS inside campuses
16	My ICT competencies are not good enough to use the LMS and its tools
17	Trainings to use LMS and its tools for students are rarely provided
18	There is shortage in the awareness about the usefulness of LMS and its tools
19	There is shortage in providing technical support to students when needed
20	It is difficult to use and deal with the LMS and its tools
21	I believe that the LMS is not sufficient enough in terms of its capabilities
22	Instructors are not prepared or good enough to use the LMS
23	Delivered materials through the LMS are with low quality
24	I believe that learning through LMS makes the learning process much easier
25	I do not want to attend training courses that show me how to use the LMS effectively
26	I enjoyed learning my courses through the LMS
27	Discussions with my classmates through the LMS are less effective and less valuable
28	I can express myself freely through the activities conducted through the LMS
29	Learning through the LMS motivates me to learn more
30	I prefer to use and access learning content provided through the LMS than any other options
31	I am able to lean whenever and wherever I want once the learning content is made available through the LMS
32	Learning through the LMS reduces the interaction between students and lecturers inside classrooms
33	I will recommend to my classmates to study courses that are provided through the LMS
34	I believe that learning through LMS provides me with the opportunity to think critically and reach conclusions
35	Courses that are provided through the LMS are more interesting than other traditionally delivered courses
36	I believe that learning through LMS allows me to be more innovative
37	I feel that learning through the LMS requires advanced skills that I do not have
38	I believe that I will achieve great success if I continue studying all my courses through the LMS
39	Learning through the LMS increases the social bonding with my classmates
40	I am totally satisfied with my experience of learning some courses through the LMS