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The Attitude of Second Year Pharmacy Students towards Lectures, Exams and E-Learning

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***Abstract*—**There is an increasing trend toward student-centred interactive e-learning methods and students' feedback is a valuable tool for improving learning methods. The aim of this study was to explore the attitude of second year pharmacy students at the University of Babylon, Iraq, towards lectures, exams and e-learning. Materials and methods: Ninety pharmacy students were surveyed by paper questionnaire about their preference for lecture format, use of e-files, theoretical lectures versus practical experiments, lecture and lab time. Students were also asked about their predilection for Moodle-based online exams, different types of exam questions, exam time and other extra academic activities. Results: Students prefer to read lectures on paper (73.3%), use of PowerPoint file (76.7%), short lectures of less than 10 pages (94.5%), practical experiments (66.7%), lectures and lab time of less than two hours (89.9% and 96.6 respectively) and intra-lecture discussions (68.9%). Students also like to have paper-based exam (73.3%), short essay (40%) or MCQ (34.4%) questions and also prefer to do extra activities like reports (22.2%), seminars (18.6%) and posters (10.8%). Conclusion: Second year pharmacy students have different attitudes toward traditional and electronic leaning and assessment methods. Using multimedia, e-learning and Moodle are increasingly preferred methods among some students.

***Keywords*—**Pharmacy, students, lecture, exam, e-learning, Moodle.

I. Introduction

TRADITIONAL lectures as a pedagogical tool were introduced when access and sharing of knowledge among distantly located subjects were limited. Therefore, teacher with the relevant qualification, training and experience was the centre of educational process. This concept has been challenged in the last two decades with the introduction of the internet, new generations of portable computers, laptops and tablets as well as multimedia and online learning management systems (LMS). Therefore, there is an increasing trend toward transcending from traditional didactic, teacher-focused teaching to more student-centred methodologies that actively engage students in the learning process [1]. Several factors influence students learning including attitude, motivation, genuine interest and classroom interaction. Classroom interaction is considered a potential area for focus in attempting to improve the learning environment [2]. Different forms of interactive teaching techniques have been introduced to complement the traditional long lectures and enhance students learning outcomes. These forms include, but are not limited to problem solving, short lectures, small groups learning, demonstration, case study, blended learning and online learning [3].

One of the methods to enhance classroom interaction and students, and the learning outcome is e-learning. The term e-learning covers a broad spectrum of pedagogical tools and approaches that continue to evolve to meet the needs of students and educators [4]. E-learning is a method of teaching and learning using electronic media; it is also referred to as web-based learning, online learning, distributed learning, computer-assisted instruction and internet-based learning [5].

Due to place and time flexibility, e-learning is increasingly adopted by universities and students. Various web pages, PowerPoint files, images, videos, and interactive materials can be uploaded into e-learning platforms [6]. Advantages such as accessibility, ease of use, time and place flexibility, diversity of content, collaboration, freedom of navigation, high quality medical images and the possibility of repeat practice are among the reasons mentioned for their preference [2]. E-learning has also become a necessary tool, and the platform most commonly used is the LMS. Despite its advantages, the primary drawbacks to online learning are technical issues like availability of computers and access to internet, training and student isolation [2].

Some students miss the interaction in a regular classroom, whereas self-directed learners are more successful in online education. Another new system that is being used widely these days is blended learning where teacher teaching multimedia classes are combined with e-learning technology [5]. Blended learning is an alternative to fully online learning, which is an integrated combination of traditional learning with web-based online approaches, the combination of media and tools deployed in the e-learning environment and the combination of number of pedagogical approaches. Implementation of blended learning brings strengths and overcomes weakness of either traditional methods or e-learning [7]. Student feedback is an integral part of the educational process, assessment and improvement of learning outcomes, and currently there are limited published papers that explore students' attitudes towards lecturing, exams, e-learning and blended learning techniques in Iraqi universities. Therefore, the aim of this study was to investigate the attitudes and practice of second year pharmacy students at the University of Babylon towards lectures, exams and e-learning.

II. Method

In this cross-sectional study, second year pharmacy students at the University of Babylon were surveyed for their attitude and practice toward lecturing, exams and e-learning in May

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2017. A 26-question paper questionnaire, which was divided into three sections, was designed for the study to collect data from students. The first section explored students' attitudes and practices towards content, formats and times of lectures as well as laboratory experiments. The second section of questionnaire assessed students' preferences for the types of exam questions and exam timings. The third section addressed students' attitudes and practices towards e-learning, use of digital files and multimedia for learning as well as their attitudes towards Moodle-based online exams. The questionnaire was distributed randomly among students, who were not required to provide personal information to minimize recall bias.

SPSS 24.0 (SPSS, Chicago, IL) and Microsoft Excel 2016 (Microsoft Corporation, Seattle, WA) software for Windows were used for data entry and for statistical analysis. The results were expressed as numbers and proportions. Chi-square test was used to assess the difference between proportions, where $P<0.05$ was considered statistically significant.

III. Results

A total of 120 questionnaires were distributed randomly among second year pharmacy students; 30 students did not participate in the survey, and thus, the final sample consisted of 90 students (participation rate of 75%). In this survey, females constituted 77.8%, while males formed 22.2% ($P<0.001$). The majority of respondents were living in the Hilla (67.8%) or Babylon districts (16.7%) ($P<0.001$).

Regarding students' preferences for lectures, the majority of students (73.3%) prefer to read lectures on paper, compared to 24.4% who prefer combined paper and electronic form, while only 2.2% prefer completely electronic files; these differences were statistically significant ($P<0.001$) (Fig. 1 A). Most students prefer to have MS PowerPoint alone (38.9%) or in combination with MS word file (37.8%), but these differences were not statistically significant ($P>0.05$) (Fig. 1 B). Students prefer short lectures of less than five pages (58.9%) or five to 10 pages (35.6%) ($P<0.001$) (Fig. 1 C). The vast majority of students (95.6%) like to have images in lectures. Students prefer practical laboratory experiments (66.7%) more than theoretical lectures (10%); these differences were statistically significant ($P<0.001$) (Fig. 1 D). As for the time of lectures and labs, students prefer short lectures of less than one hour (32.2%) or one hour and half (58.9%) or 2 hours (7.8%) ($P<0.001$) (Fig. 2). The same preference also applies to lab times, as students stated that they prefer lab time of one hour (40%) or one hour and half (33.3%) or two hours (23.3%) ($P<0.01$) (Fig. 2). A large proportion of students (68.9%) indicated a beneficial effect for intra-lecture discussions, as compared to 23.3% who think that these discussions have negative effects; these difference were statistically significant ($P<0.001$).

The majority of students (73.3%) prefer to have paper-based exams, compared to 20% who prefer mixed paper and Moodle-based exams, while only 4.4% prefer Moodle-based exams ($P<0.001$) (Fig. 3). With regard to types of exam questions, most students chose short essay (40%), MCQ (34.4%) or a combination of both (34.4%); these differences were statistically significant ($P<0.001$). Students also wish to have sufficient time allowed for exams as they like to have two hours (47.8%) or three hours (30%) exam time ($P<0.001$). As for the extra activities, students like to have additional marks for their attendance (33.5%), reports (22.2%), seminars (18.6%), quizzes (11.4%) and posters (10.8%) ($P<0.001$) (Fig. 4).

IV. Discussion

The results of the current study showed that the majority of participants were females; this could be attributed to the predominance of females in the college of pharmacy student. Females have been achieving higher grades in secondary schools in Iraq than males. Most of the participants have been living in Babylon, and as students, prefer to study in universities based in their cities; therefore, the sample is representative of Babylon Province.

As for the lecture format, pharmacy students prefer to read lectures on paper and to a lesser extent in combination with electronic files. This finding indicates that pharmacy students still have an inclination for traditional methods of reading and reviewing lectures and are still not familiar with reading lectures on screen. A proportion of students, however, have been reading PowerPoint files or other study materials that help them to understand lectures' content on computers, tablets and mobile phones. This implies that using technology by students for learning is an emerging phenomenon among Iraqi university students. Our results are congruent with those of another survey among university students in Malaysia which showed that 80% of students perceive that lecture notes are essentials for their courses and 70% are interested in using online resources for their study and assignments [8]. One issue with using online resources is multitasking with non-educational purposes. A study that surveyed secondary schools students in Greece revealed that 84.6% are using a PC for educational purposes and 92.3% are also using a PC for non-educational activities [9].

Around two-thirds of students stated that they like to have the PowerPoint file of a lecture alone or in combination with an MS word file. A possible explanation is that students consider the PowerPoint file as summary of the lecture. Moreover, PowerPoint files allow the inclusion of interactive materials like images, graphs, audio, video and other multimedia content which make lecture content more attractive and improves students' learning. Our results are consistent with the finding of another study conducted among undergraduate medical students which showed that more than half of students are using MS office software and online websites for their study with the limitations of computers and the internet as the main drawback [5]. Several studies have reported that e-learning [2] and blended learning [7], [10], [11], including in Iraq [12], improve students' learning outcomes in comparison with traditional teaching methods. A recent study conducted by Faraj and Hassan among school students in Erbil and Sulaimania governorates, Iraq, reported many advantages for e-learning including enhancement of

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education, decrease in the need for special tutors, support for disabled students as well as a reduction in inequity and rural-urban educational gap [13]. A study that surveyed university students in Malaysia demonstrated that around 64% of students are spending 5-10 hours per day using information and communications technology (ICT) [8]. Audio-Visual multimedia are more effective than audio or text files alone for enhancing students' motivation and learning [10], [14].

In the current study, students demonstrated a predilection for short lectures over long lectures in term of number of pages. Long lectures that are based mostly on text rather than bullet points, summary tables, images or graphs are less likely to attract students' attention and interest, and as a result, students tend to find them boring. This is also consistent with our finding that 95.6% of students like to have images in lectures as these images help to clarify text content.

Around two-thirds of students expressed their preference for practical lab experiments over theoretical lectures. These results could be attributed to the fact that student numbers in labs are lesser than that in theoretical lectures, which can be considered as a form of small group teaching. Another explanation is that students in labs have higher chance for intra-lecture discussions, which could improve their learning outcomes. Students also perceive that they are doing experiments in the lab with their peers rather than being passive listeners in large lecture halls, which could be boring to many of students. These results are also in parallel with our finding that 68.9% of students surveyed wish to have intra-lecture discussions and perceived them as beneficial for their learning. Our findings are in agreement with a study which showed that fusing lectures and labs temporally and spatially enhanced students learning, interaction and experience [15]. Indeed, the extension of lab times augments lectures, reduces passive learning and increases students activities [16].

Regarding lectures and lab times, pharmacy students prefer short lectures and labs (less than 2 hours). This finding is congruent with the reports that indicated that students attention span is limited to 50 minutes [15], suggesting the adoption of multiple short lectures rather than a single long lecture is optimal for learning outcomes.

As for exams, the survey revealed students' predilection for paper-based exams over online exams like Moodle. Students explained in their responses that they like the idea of doing online exam and receiving their grades immediately after, but they also like to have extra time for reviewing their answers before submission. Online exams are still a new method of examinations among Iraqi universities and students, and further training for both staff and students is require, while all the difficulties and issues need to be addressed before shifting from paper-based to computer-based or online exams. Preliminary studies in Iraq reported that students prefer the Moodle platform for interactive e-learning and exams over traditional learning and assessment methods [13], [17], with higher reaction to the e-learning environment and higher learning scores reported in one study [18]. Khan has constructed a model of e-learning of eight dimensions for effective e-learning. These dimensions comprise institutional, management, technological, pedagogical, ethical, interface design, resources and evaluation dimensions [19]. A study compared Moodle-based learning and quizzes with traditional learning and assessment demonstrated that using Moodle improves students' learning and formative assessment [20].

Our results are in contrast with a study conducted in the University of Minnesota, US, which demonstrated that 84.3% of students are using online platforms for the submission of assignments, quizzes and exams [14]. The main advantages of these platforms reported by students were ability to do homework at home and time flexibility. A recent study on 100 undergraduate students at the University of Information Technology and Communication in Baghdad, Iraq, explored the use of virtual reality to improve learning outcomes and reported higher Likert scale (1-5 scale of preference) for these students [21]. Philips compared lectures presented in the traditional method with the online method for pharmacy students at Midwestern University, Chicago College of Pharmacy, US, and reported higher students' scores in final exams, while students stated that the online contents complement traditional lectures [22].

Pharmacy students like MCQ questions solely or in combination with short essay questions as opposed to long essay questions. This finding could be explained by the fact that MCQ questions test students understanding and comprehension rather than their long-term memory of the study subject. Moreover, MCQ questions are objective in terms of marking of answers and exclude bias related to the opinion of the teacher marking the answer. Our results are consistent with another study which showed a preference of students for MCQ questions over long essays, and higher preference for MCQ questions [23]. MCQ questions have the advantages of being objective, cover a wide range of topics and can be undertaken and scored quickly. Disadvantages, however, include the careful design required for preparation and students guessing of answers. Essay questions, on the other hand, allow individual expression and test depth of learning; however, they are time consuming, cover few topics and are less objective [24].

V. Conclusions

Second year pharmacy students at the University of Babylon prefer to read lectures on paper, PowerPoint file, and undertake practical experiments and attend short lectures with discussions. Using multimedia, e-learning and Moodle are the favoured emerging methods among students. Further large-scale studies are recommended to assess students' attitudes towards lecturing and e-learning in Iraqi universities.

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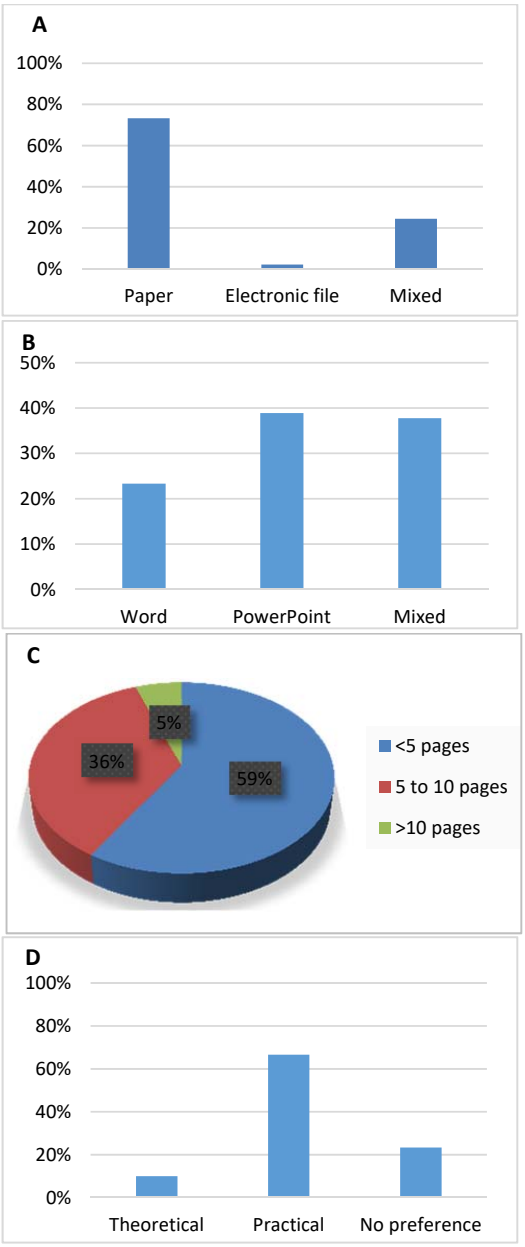


Fig. 1 Students' attitudes towards lecture format (A), e-files (B), number of lecture notes pages (C) and theoretical vs. practical lectures (D)

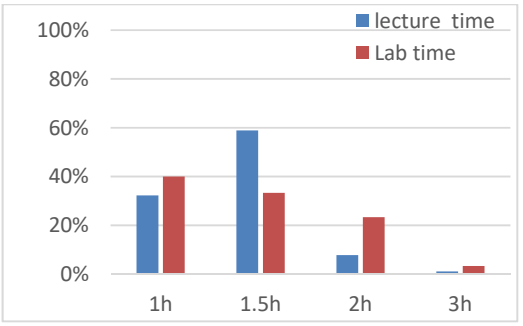


Fig. 2 Students' attitudes towards lectures and lab times

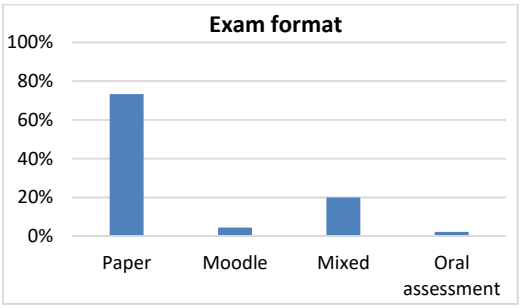


Fig. 3 Students' preferences for exam type

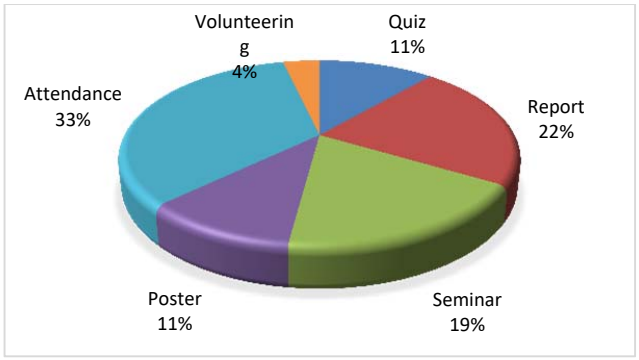


Fig. 4 Students' attitudes towards extra-activities

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