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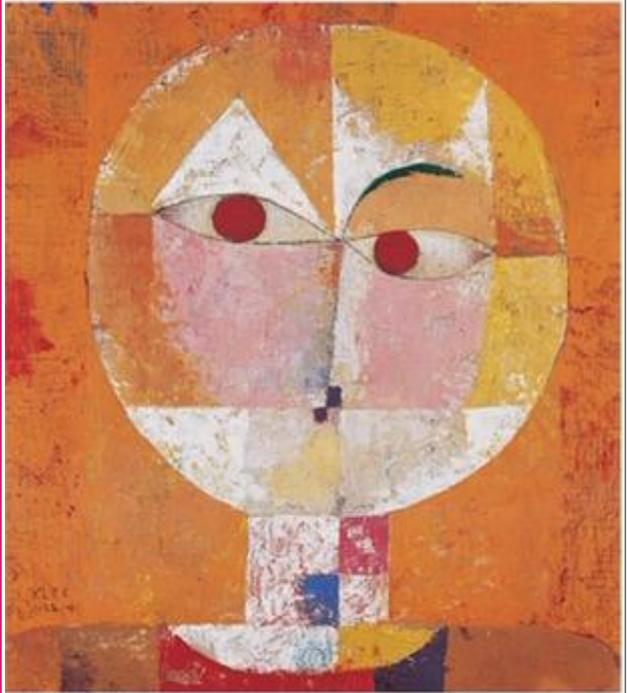
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Using the Moodle to support effective teaching and learning of math

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Abstract

This paper focuses on the use and benefits of the Moodle in teaching and learning math for business at Al Ain University. This research used both quantitative and qualitative methods. As a result, the teachers unanimously considered that the use of the Moodle made teaching math for business easy and interesting compared to the traditional method, which affirms the students' attitude towards the platform. In conclusion, the positive attitude of both teachers and students in using the Moodle is an indication of the potential success of future effort to optimize the use of its functions.

Keywords: Learning, Management, Moodle, Math, Business.

Uso de Moodle para apoyar la enseñanza y el aprendizaje efectivos de las matemáticas

Resumen

Este documento se centra en el uso y los beneficios de Moodle en la enseñanza y el aprendizaje de las matemáticas para los negocios en la Universidad Al Ain. Esta investigación utilizó métodos cuantitativos y cualitativos. Como resultado, los maestros consideraron

por unanimidad que el uso de Moodle hizo que la enseñanza de las matemáticas para los negocios fuera fácil e interesante en comparación con el método tradicional, que afirma la actitud de los estudiantes hacia la plataforma. En conclusión, la actitud positiva tanto de los maestros como de los estudiantes al usar Moodle es una indicación del éxito potencial del esfuerzo futuro para optimizar el uso de sus funciones.

Palabras clave: aprendizaje, gestión, Moodle, matemáticas, negocios.

1. INTRODUCTION

Teaching and learning are the main processes of comprehension of the basics of a given subject along with its full internal logic. LAZAKIDOU & RETALIS (2010) argue that the traditional methods of teaching and learning, particularly focusing on math for business, are becoming obsolete and do not reflect the current expectations or practices. In line with such statement, CLARK-WILSON, ROBUTTI & SINCLAIR (2013) mention that generally, teaching math for business is complicated because students find this subject not interesting and absolutely difficult to be understood. Students of math for business basically expose serious difficulties in their learning while most of them are struggling in order to completely understand the reasoning, which lies beyond the mathematical concepts (NDLOVU & MOSTERT, 2017). Such difficulties may have a negative influence on students' behaviors, in terms of anxiety and stress concerning math learning, and their vocational prospects during their entire life in the long term. Shedding the light on such an obstacle, experts were seeking the best convenient tools by which teaching math for business

could be made simple and interesting (LOPES, BABO & AZEVEDO, 2008; NDLOVU & MOSTERT, 2017).

The entry of the era of technology paved the way for the use of Learning Management Systems (LMS) platforms into the education curricula which can extremely enhance the teaching and learning outcomes and methods. However, there is still a need for detailed explanations and discussions along with innovative research concerning such a topic. The Moodle technique became the easiest method to teach maths for business in schools and universities (COLE & FOSTER, 2008; BLANCO & GINOVART, 2009; CLARK-WILSON ET AL., 2013; BRIJLALL & MAHARAJ, 2017). There are many benefits gained from its usage, such as saving time and efforts, while making the interaction between teachers and students easy and interesting. In short, math for business experts recommend the use of Moodle in teaching, not only math for business, but also other courses (CALVANI, FINI, MOLINO & RANIERI, 2010).

The Moodle is considered one of the best LMS-based techniques in teaching and learning math for business. As such, this motivates the researcher to explore its world, how it is used, while figuring out the benefits gained from using it in terms of how it will improve the process of education curricula and enhance learning methods as well as the achievement of the aimed outcomes. The basic aim is to confirm the benefits of this new technique that in turn, can make the process of teaching math for business easy for teachers and the process of learning full of fun and interesting for students.

The general research question is: How can the Moodle be used in teaching and learning math for business? From this main question, the following sub-questions are asked:

- 1) Can Moodle be considered as the best LMS-based technique to teach and learn math for business?
- 2) How can the Moodle be used professionally to teach students of math for business?
- 3) What are the advantages or disadvantages of using Moodle in assisting students to learn math for business?
- 4) What are the best solutions to overcome any issue in teaching and learning math for business via Moodle?
- 5) What are the recommendations in employing LMS, especially Moodle in the process of math for business teaching and learning?

2. METHODOLOGY

This research used both quantitative and qualitative methods. Quantitative is associated with the positivism philosophy and focuses on the deductive approach. Analysis of some limited number of

variables by establishing measurable and significant links between these variables facilitated the process of answering the research questions. The Moodle was considered as an independent variable, while math for business status is the dependent one. Hence, such links were measured numerically and analyzed employing the statistics.

Qualitative research is associated with interpretivism philosophy and focuses on the inductive approach. The researcher conducted interviews with the participants, the result of which was analyzed and conclusions were drawn to support the results of the quantitative method. Results of both the qualitative and quantitative methods were used in answering the research questions (BLAIKIE, 2006). According to THOMPSON (2002), sampling in a quantitative method should be large, while questionnaires' answers should be short. As to the qualitative method, the sampling should be short and the questions need to be answered in detail.

On the one hand, in conducting the quantitative method, the researcher selected a sample size of 80 participants representing students at Al Ain University. The questionnaire (Illustrated in appendixes) was designed and distributed via e-mails or social media. After obtaining the answers, the data collected were analyzed using the Statistical Package for Social Science software (SPSS). On the other hand, in conducting the qualitative method, three participants, representing math for business teachers at Al Ain University, were interviewed separately. The questions asked are stated in the appendix. Their answers were transcribed, tabulated, analyzed, and interpreted to

answer the research questions and select the hypothesis (BRYMAN & BELL, 2003).

3. RESULTS AND DISCUSSION

There were 80 respondents in total. Presented in Table 1 are the profile of the respondents in terms of gender, nationality, age, education level, and occupation. There are slightly more female respondents (56.25%) than male respondents, which also reflect the gender composition of the student population of the university. Generally, the students are Arabs (including the locals, who are also Arabs), with the non-Arabs constituting a very small minority (5%). The majority of the students are between the ages of 21-40 years old (86%) and employed (79%). Most of the respondents (93%) of the survey are in the first and second year of their program, when they take the Math for Business course.

Table 1: Profile of Respondents

	Frequency	Percent
Gender		
Female	45	56.25
Male	35	43.75
Total	80	100
Nationality		
Local	41	51.25
Arab	35	43.75

Non-Arab	4	5
Other	-	0
Total	80	100
Age		
Under 20	10	12.5
21-30	38	47.5
31-40	31	38.75
41-50	1	1.25
Above 50	-	0
Total	80	100
Education		
First Year	56	70
Second Year	18	22.5
Third Year	-	0
Fourth Year	6	7.5
Other	-	0
Total	80	100
Occupation		
Unemployed	17	21.25
Employed-public sector	18	22.50
Employed-private sector	28	35
Self-Employed/Business Owner	17	21.25
Other	-	0
Total	80	100

The second part of the instrument is divided into two sub-parts. The first sub-part, presented in Table 2, focused on collecting information regarding students' reasons for using the Moodle, how

they use the Moodle, the activities in which they use the Moodle, the resources they are interested in, and the skills used. The second sub-part, shown in Table 3, solicited students' attitudes towards certain aspects of the Moodle.

Students (29% of the respondents) use the Moodle mainly to meet specific requirements of the course which focus on certain features of the Moodle. Students (24%) also use Moodle to better understand complicated math. The majority of the students (55%) use the Moodle in order to correspond with their teachers. Students (28%) also use the Moodle to receive instructions from their instructors conveniently. The main activity in using the Moodle is communicating with the instructor via Email (51%) and answering survey questionnaires posted by the university (43%). The Moodle resource mainly used is inserting a specified label (40%) and directories display (34%). While majority of the respondents (67%) claimed moderate to good skills in using Moodle, 33% claimed to have no experience in using the Moodle platform.

Table 2: Students' Use of the Moodle

Reasons for using the Moodle in learning of Math for Business	Total	Percentage
Specified requirements focus on features and targets of the course	23	28.75%
In order to understand better the complicated math.	19	23.75%
I have previous experience of Moodle platform	18	22.50%
Specified needs centered on the targets of the	11	13.75%

taught curricular unit		
Other	9	11.25%
Total participants	80	100%
Purpose of using the Moodle in learning Math for Business	Total	Percentage
In order to correspond with my teachers via e-mails or messenger.	44	55 %
To make receiving the tasks from my teachers easy.	22	27.50 %
As such a repository of the given contents.	9	11.25 %
To organize my math for business courses.	5	6.25 %
To get the ability to solve math for business at home.	--	0 %
Other	--	0 %
Total participants	80	100%
Moodle activities used during learning math for business	Total	Percentage
E-mails	41	51.25 %
Questionnaires and Survey	34	42.50 %
Messenger	5	6.25 %
Lectures	--	0 %
Database	--	0 %
Other	--	0 %
Total participants	80	100%
Moodle resources used in learning math for a business that is interesting	Total	Percentage
a- Inserting a specified label.	32	40 %
b- Directories display.	27	33.75 %
c- Linking to a specified URL or files.	11	13.75 %
d- E-books.	10	12.50 %
e- Other.	--	0%

Total participants	80	100%
Skills in using Moodle	Total	Percentage
a- I have good skills and experience as math for business students.	29	36.25 %
b- I have not any experience in this platform.	26	32.50 %
c- I have moderate skills and experience as math for business students.	25	31.25 %
d- Other.	--	0%
Total participants	80	100%

The majority of students (78%) agree that Moodle facilitates the process of learning math for business. They (68%) agreed that the Moodle saves them time and effort in learning math for business and that their (68%) learning styles are improved with the use of the Moodle. They (66%) believe that Moodle has improved the communication between teachers and students with the use of Emails and chats. The majority of the students recommend the use of Moodle for all types of courses (56%) and all types of learning (55%).

Table 3: Students' Attitude towards the Moodle

	Agree		Disagree	
	Total	Percentage	Total	Percentage
Moodle facilitates the process of learning math for business.	63	78.75%	17	21.25 %
Moodle saves time and effort in learning math for business.	54	67.50 %	26	32.50 %

My learning style based math for business improved when using Moodle.	54	67.50 %	26	32.50 %
Using chats and emails are easy between teachers and students after using Moodle.	53	66.25%	27	33.75 %
I recommend other students to use Moodle in all types of their courses.	45	56.25 %	35	43.75%
Moodle is considered useful for all types of learning.	44	55 %	36	45 %
Based on the terms of flexibility, Moodle is weak.	35	43.75 %	45	56.25 %
My traditional ways of learning math for business is better than using Moodle.	35	43.75%	45	56.25 %
Moodle is useless in my educational usage.	35	43.75%	45	56.25 %
Moodle is weak in learning math for business.	17	21.25 %	63	78.75%

It can be highlighted here that according to the majority of the students, the use of the Moodle is mainly to facilitate teacher-student correspondence with the use of Emails. Communication is vital to the teaching and learning process. Effective communication is key to effective teaching since teachers impart knowledge as a key

component of the teaching process. However, the Moodle has multiple functions that should be optimized not only as a channel of communication, albeit an important communication element.

Students' attitude towards the use of the Moodle is generally positive, with the willingness to use it in all courses. While majority of the students agreed that the Moodle facilitates the process of learning math for business, this does not really manifest in how the majority of students use the Moodle (which is mainly for correspondence), reflected in the activities they have using the platform. However, this positive attitude towards the Moodle may be used as a springboard for the optimization of the use of its functions.

Three teachers who have experience and skill in teaching Math for Business using the Moodle were interviewed. The interview solicited responses on the Moodle resources they use, their attitude towards the use of the Moodle as compared to the traditional method, the perceived benefits and challenges of using the Moodle, and their recommendations.

The teachers affirmed that they mainly use the insert a specified label in the Moodle in teaching math for business, corresponding to survey results in Table 2. The teachers unanimously considered that the use of the Moodle made teaching math for business easy and interesting compared to the traditional

method, which affirms the students' attitude towards the platform as found in Table 3. The teachers believe that the use of Moodle saves them time and effort.

In general, the teachers share the same positive attitude towards the use of Moodle in teaching and learning math for business. This positive attitude is an important consideration in future efforts to enhance and optimize the use of Moodle in the future—beyond the use of the platform merely for correspondence. The teachers echoed the result of the survey in that they recommended the use of the Moodle in teaching other courses.

4. CONCLUSION

This study attempted to shed light on the use of the Moodle and the benefits gained from employing them in teaching and learning math for business. At AAU, the use of the Moodle in teaching math for business is limited and has room for optimization. The positive attitude of both teachers and students in using the Moodle is an indication of the potential success of future effort to optimize the use of its functions.

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