

*Impact of Virtual Learning Environment (VLE) –
Moodle on students' learning experience at the
University of Wales Trinity Saint David*

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Introduction

Ever since the new millennia, technological progress has caused many “waves of educational change” (Garcia-Huidobro et al., 2017, p. 263) especially in relation to online education. More and more universities in the UK have begun offering students a form of hybrid education which consists of both online courses and regular in-class activities which require the students’ physical presence at the university. At the same time, several universities offer exclusively online classes and are ideal for distance learning, while others have maintained the classical setting. However, in the past few months, new regulations aimed at controlling the spread of the virus SARS-CoV-2, have forced universities to switch their classes online. This has caused some students to accuse lack of motivation and a real struggle with managing online courses (Hall and Batty, 2020). Taking this aspect into consideration, this research report uses both secondary data and quantitative methodologies to assess how students at the University of Wales Trinity Saint David have experienced their study using the Virtual Learning Environment (VLE) Moodle.

Literature review

According to Qvist et al. (2015), educational technology of the future incorporates simulation, game based learning, and other forms of interactive virtual learning environments (VLEs). In these authors’ view, VLEs can be defined as complex learning environments which focus on carefully designed exercises and goals focused on the provided content, all aimed to encourage students to engage in practice based learning and a high amount of individual research. Finally, Qvist et al. (2015) conclude that VLEs should also be easy to use and intuitive, which is considered a crucial aspect in enabling student satisfaction. Along the same line of thought, Boboc and Koc (2018) argue that higher education VLEs should be centred or focused on student performance and critical thought stimulation.

In this respect, Lavigne et al. (2015) consider that VLEs should be dynamically built and should take into consideration the student experience. Lavigne et al. (2015) suggest that can be achieved through log analysis, which can be basically described as an analysis of the user experience, and different programme bugs or short comings which can help the developers improve the VLE. In other words, VLE development and high student satisfaction are based primarily on student feedback regarding their experience. Similarly, Costello et al. (2019) focus on the VLE Moodle and how its bug tracker has managed to help the developers of this environment to continuously improve the programme. In addition to student feedback, however, Costello et al. (2019) also indicate that teacher or tutor feedback is crucial, observing that teachers may also encounter various issues and bugs in their own user interface, which is different than that of the students.

Several studies (Lydon and Hale, 2015; Cassidy, 2016) regard how the combined use of VLE and regular class study can impact both on the teaching and learning experience, indicating that students are more often focused on flexibility and enhanced learning skills, the learning and development of their digital skills and the sense of community, while teachers are more focused on the availability of a greater variety of teaching methods and the effectiveness of the VLE in delivering a wide source of materials to the students, from which they can learn more and improve their academic achievements.

With regard to academic efficiency, Juarez Santiago et al. (2020) argue that there are several factors which can be used to measure the success of VLEs, among which are the use of integrated factors for efficient learning, accessibility, reliability, and programme architecture. In terms of reliability, a question of security is risen (Bandara et al., 2014), as concerns regarding cyber-attacks and the safety of sensitive user data, such as name, personal identification information and academic results may occur. In the area of cyber security, Amo et al. (2020) have demonstrated using evidence from practice that the VLE Moodle has managed to be developed to a certain extent to include plugins aimed at protecting sensitive user data. By making use of privacy policies and terms and conditions, Moodle developers guarantee data safety and make sure the users provide their informed consent for making use of the VLE.

As far as research regarding student satisfaction with VLEs is concerned, studies (Barker and Gossman, 2013; Beluce and Oliveira, 2015; Karuovic et al., 2020) have shown that overall students have reported a positive experience in using VLEs, being mainly motivated by the flexibility of distance learning, and the ease of use of the VLE. Moreover, Karuovic et al. (2020) have observed that IT students are more likely to be more comfortable with the use of VLEs, suggesting thus that digital competencies play an important role in the level of satisfaction students have when learning using VLEs. This can also be corroborated with the difficulties some tutors have reported when using Moodle (Salhab, 2019) arguing that while overall teachers had a positive attitude towards using Moodle for virtual teaching, some have reported difficulties in using the technology of the environment. Considering this, it would be interesting to learn if students also find learning more difficult when using Moodle.

Data collection method

A quantitative method in the form of a survey was used in order to collect the primary data for the current study. Johnson and Christensen (2017) argue that quantitative methods of data collection are guided by positivism, which is a philosophy that indicates a phenomenon can only be described by measurable observations. This was deemed appropriate for the current research report, as it allows for a scale measure of several aspects, with the purpose of assessing the experience of students at the University of Wales Trinity Saint David with Moodle.

The questionnaire use only closed-ended questions, with three multiple choice questions designed to set demographic and general information regarding the length of time using Moodle, and seven Likert scale items (Johnson and Christensen, 2017) designed to measure several aspects of students' experience with using the VLE (Appendix 1). The questionnaire was designed starting from the secondary data. It was distributed to several students from the University of Wales Trinity Saint David who have experienced studying via the Moodle platform. Ten students chose to participate. In order to comply with ethical considerations (Johnson and Christensen, 2017), students were informed about the purpose of the study, and no personal information was collected, such as name, email or student number. The data was analysed using statistical methods.

Analysis and discussion

Descriptive statistics were used to analyse the collected data. Descriptive statistics can provide a high amount of information regarding the data sample and given the small size of the sample, were deemed appropriate for the current analysis. As far as demographics information is concerned, the age ranges of the 10 respondents are presented in the graph below:

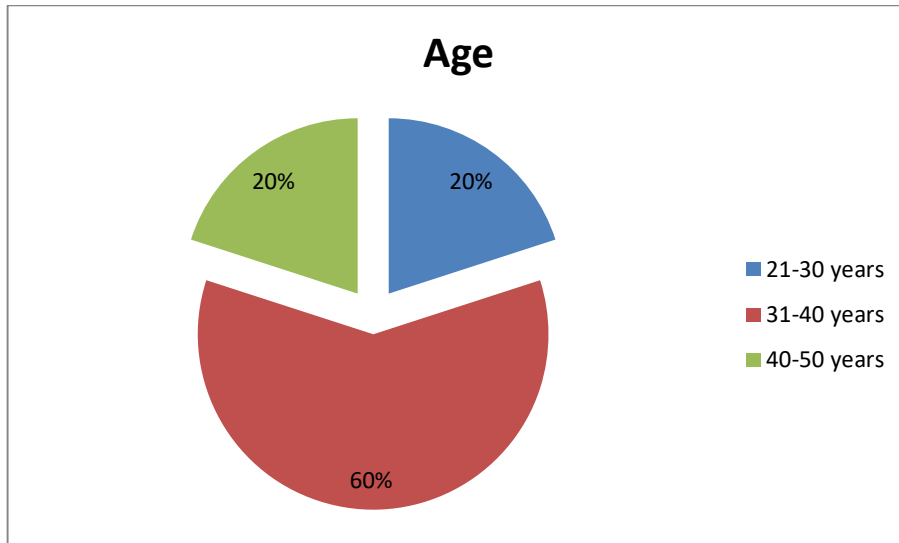


Image 1: Age range of participants

As the graph shows, the majority of the participants are between the ages of 31 and 40 years (60%). This information may be relevant in terms of digital competency skills as described by Karuovic et al. (2020), therefore the information will be taken into account when discussing the results of the descriptive statistics.

In order to prepare the data for analysis, a coding system was used to transform responses in numerical information. The full responses, as well as the coding, is presented in Appendix 2. As the classical form of the 5 point Likert scale was used for questions 5 to 10, the values are attributed to the scale from strong disagreement to strong agreement. The results of the descriptive statistics analysis are presented in Appendix 3.

In terms of frequency of attendance (Appendix 3) the mean value of 3.3 suggests a moderate level of attendance of the respondents to classes using Moodle. A positive value of the skewness in this question suggests that in terms of data asymmetry, there are more values on the left side of the curve, meaning that more of the students who responded attend classes less often than the mean. Moreover, the skewness value shows that the data is not normally distributed in the sample. As far as the ease of use is concerned, more people tend to disagree to the statement (mean value of 2.6). The skewness of -0.04 suggests the data is more normally distributed than in the case of question 5, however the sample variance of 1.377 shows the data is more dispersed from the mean. The distribution is explained in the chart below:

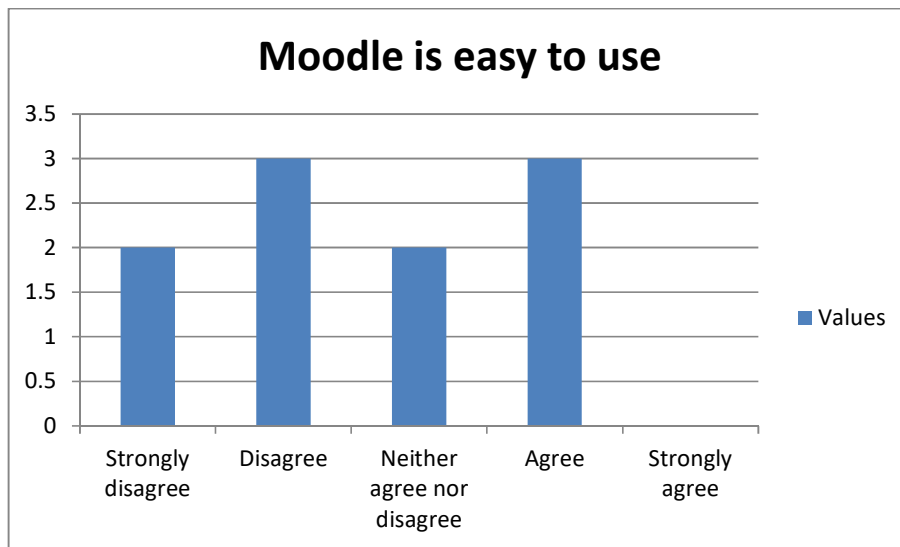


Image 2: Perceived ease of use

As the chart shows, the same number of people has expressed agreement and neutrality as they did disagreement.

In terms of security (Appendix 3), more people seem to believe that the VLE is secure and their data is protected, in comparison to the perceived ease of use (a mean value of 3.4 compared to the mean of 2.6 for the previous question). This information corroborates with the findings of Amo et al. (2020), who argued much progress has been made in terms of data security and privacy protection for Moodle. In terms of class difficulty, the mean value of 3.4, together with a negative skewness suggests more people perceive classes as being more difficult using VLE (Moodle). This is also corroborated by the negative value of the kurtosis (-1.16), which indicates a flat distribution of the data. While the literature generally correlates a perception of difficulties using VLEs with a lack of digital skills (Barker and Gossman, 2013; Salhab, 2019; Karuovic et al., 2020) this is not emphasised here by the participating students' self-assessment of their own digital skills, as more people tend to disagree that they lack the digital knowledge to operate Moodle.

Overall, the data suggests most of the respondents believe VLEs such as Moodle are the future of academic learning (a mean of 3.7, suggesting a tendency towards agreement with the given statement) which mirrors the views of Qvist et al. (2015). Still, the negative skewness of -0.80 and the positive kurtosis of 1.23 which show the data is not normally distributed. The percentage of the distribution of data is presented in the chart below:

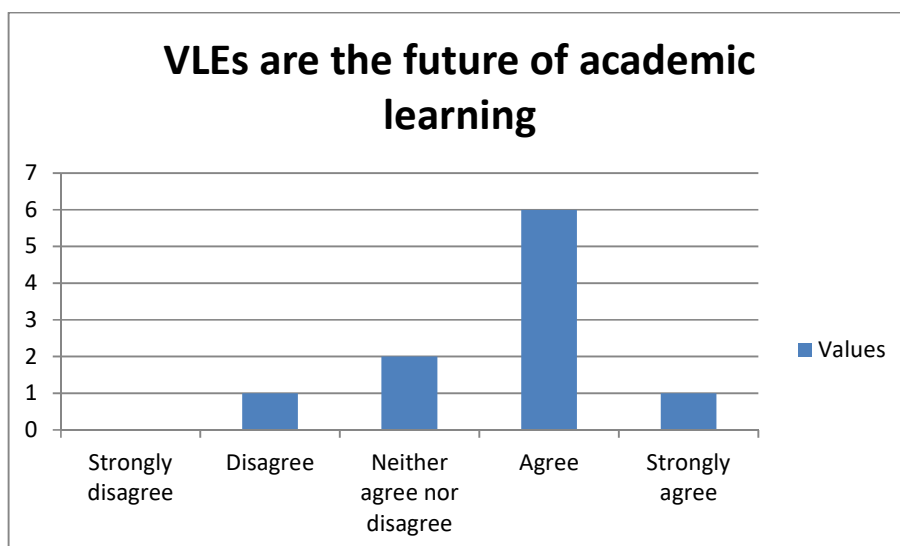


Image 3: Perceptions of VLEs as the future of academic learning

At the same time, students seem to have a neutral opinion regarding teachers' difficulties in using Moodle (a mean value of 3.2, with a skewness of 0.09 showing a tendency towards normal distribution of the population), which contradicts the findings of the literature (Salhab, 2019). This result may also suggest students' lack of interest in teachers' abilities to use Moodle.

Conclusion

The aim of this study was to assess how students at the University of Wales Trinity Saint David have experienced their study using the Virtual Learning Environment (VLE) Moodle. The results seem to suggest an overall positive experience, despite the fact that courses are perceived as more difficult and the environment itself is generally not seen as being easy to use. Despite this, the general perception of students seems to be that VLEs such as Moodle represent the future of academic learning.

A significant limitation of the current study is the limited amount of statistical tests conducted due to the reduced amount of data and small sample size. The small sample size could have also increased the margin of error of the study, as shown by the values of sample variance and standard deviation. In terms of future research, an analysis of teachers' experience with VLEs can also provide important data for the future development of VLEs as a means to enhance the academic experience of learning and teaching in UK universities, especially in current times when restrictions have limited academic exchanges to the online environment.

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Appendix 1

DSR VLE Survey

This survey contains a few questions aimed at evaluating the students' experience at the University of Wales Trinity Saint David with using Virtual Learning Environment (VLE) for online courses during the COVID-19 pandemic. Participation is optional and no personal information about the participants will be collected. You may withdraw participation at any time during the survey. Submitting the survey is considered your consent to participate.

* Required

1. Are you a student at the University of Wales Trinity Saint David? *

Mark only one oval.

☐ Yes

☐ No

2. Please state your age *

Mark only one oval.

☐ 18-20 years

☐ 21-30 years

☐ 31-40 years

☐ 40-50 years

☐ 51 years or above

3. Have you attended at least one class in a VLE programme such as Moodle? *

Mark only one oval.

☐ Yes

☐ No

4. How often do you attended online classes using Moodle? *

Mark only one oval.

	1	2	3	4	5	
Not at all often	☐	☐	☐	☐	☐	Very often

5. Please rate the following statement: Moodle is easy to use *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	☐	☐	☐	☐	☐	Strongly agree

6. Please rate the following statement: Moodle is secure to use. *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	☐	☐	☐	☐	☐	Strongly agree

7. Please rate the following statement: Using Moodle has made classes more difficult *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	☐	☐	☐	☐	☐	Strongly agree

8. Please rate the following statement: I believe I don't have the technical skills to properly use Moodle *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	☐	☐	☐	☐	☐	Strongly agree

9. Please rate the following statement: Virtual Learning Environments are the future of academic learning *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	☐	☐	☐	☐	☐	Strongly agree

10. Please rate the following statement: I have the impression some teachers do not know how to use Moodle *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	☐	☐	☐	☐	☐	Strongly agree

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Google Forms

https://docs.google.com/forms/d/1d1K1aYfVQA1RvTiQ8huuQiu0dFk9zMeaTynEDRC/_/edit#

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Appendix 2

Are you a student at the University of Wales Trinity Saint David?	Please state your age	Have you attended at least one class in a VLE programme such as Moodle?	How often do you attend online classes using Moodle?	Please rate the following statement: Moodle is easy to use	Please rate the following statement: Moodle is secure to use.	Please rate the following statement: Using Moodle has made classes more difficult	Please rate the following statement: I believe I don't have the technical skills to properly use Moodle	Please rate the following statement: Virtual Learning Environments are the future of academic learning	Please rate the following statement: I have the impression some teachers do not know how to use Moodle
Yes	31-40 years	Yes	3	2	3	5	3	4	2
Yes	31-40 years	Yes	2	1	4	5	3	4	2
Yes	40-50 years	Yes	2	1	3	5	2	4	1
Yes	31-40 years	Yes	3	2	4	2	4	3	2
Yes	31-40 years	Yes	4	3	3	3	2	4	3
Yes	31-40 years	Yes	5	4	3	3	1	3	5
Yes	21-30 years	Yes	4	4	3	2	2	4	5
Yes	40-50 years	Yes	3	4	4	4	2	4	5

Yes	31-40 years	Yes	2	2	3	4	4	2	3
Yes	21-30 years	Yes	5	3	4	1	2	5	4

Answers codes	Answer	Code
Q1	Yes	1
Q1	No	2
Q2	21-30 years	1
Q2	31-40 years	2
Q2	40-50 years	3
Q3	Yes	1
Q3	No	2
Q4	Not at all often	1
Q4	On occasion	2
Q4	Sometimes	3
Q4	Often	4
Q4	Very often	5
Q5-Q10	Strongly disagree	1

Q5-Q10	Disagree	2
Q5-Q10	Neither agree nor disagree	3
Q5-Q10	Agree	4
Q5-Q10	Strongly agree	5

Appendix 3

<i>How often do you attended online classes using Moodle?</i>		<i>Please rate the following statement: Moodle is easy to use</i>		<i>Please rate the following statement: Moodle is secure to use.</i>		<i>Please rate the following statement: Using Moodle has made classes more difficult</i>		<i>Please rate the following statement: I believe I don't have the technical skills to properly use Moodle</i>		<i>Please rate the following statement: Virtual Learning Environments are the future of academic learning</i>		<i>Please rate the following statement: I have the impression some teachers do not know how to use Moodle</i>	
Mean	3.3	Mean	2.6	Mean	3.4	Mean	3.4	Mean	2.5	Mean	3.7	Mean	3.2
Standard Error	0.366666667	Standard Error	0.371184	Standard Error	0.163299	Standard Error	0.452155	Standard Error	0.307318	Standard Error	0.260342	Standard Error	0.466667
Median	3	Median	2.5	Median	3	Median	3.5	Median	2	Median	4	Median	3

Mode	3	Mode	2	Mode	3	Mode	5	Mode	2	Mode	4	Mode	2
Standard Deviation	1.159501809	Standard Deviation	1.173788	Standard Deviation	0.516398	Standard Deviation	1.429841	Standard Deviation	0.971825	Standard Deviation	0.823273	Standard Deviation	1.47573
Sample Variance	1.344444444	Sample Variance	1.377778	Sample Variance	0.266667	Sample Variance	2.044444	Sample Variance	0.944444	Sample Variance	0.677778	Sample Variance	2.177778
Kurtosis	1.226789739	Kurtosis	-1.45663	Kurtosis	-2.27679	Kurtosis	-1.16282	Kurtosis	-0.51607	Kurtosis	1.236995	Kurtosis	-1.50674
Skewness	0.342124706	Skewness	-0.04122	Skewness	0.484123	Skewness	-0.31928	Skewness	0.453967	Skewness	-0.80646	Skewness	0.093347
Range	3	Range	3	Range	1	Range	4	Range	3	Range	3	Range	4
Minimum	2	Minimum	1	Minimum	3	Minimum	1	Minimum	1	Minimum	2	Minimum	1
Maximum	5	Maximum	4	Maximum	4	Maximum	5	Maximum	4	Maximum	5	Maximum	5
Sum	33	Sum	26	Sum	34	Sum	34	Sum	25	Sum	37	Sum	32
Count	10	Count	10	Count	10	Count	10	Count	10	Count	10	Count	10
Confidence Level(95.0%)	0.718653461	Confidence Level(95.0%)	0.727508	Confidence Level(95.0%)	0.320061	Confidence Level(95.0%)	0.886208	Confidence Level(95.0%)	0.602333	Confidence Level(95.0%)	0.51026	Confidence Level(95.0%)	0.91465