

# Measuring Learners' Experience in Online Learning Environments

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## ABSTRACT

*The adoption of online learning is increasing, hence the need to understand the learners' experience. The user experience template was studied and tailored to suit the scales used to measure learning experience in the selected online learning environments. This paper extracted six (6) scales from Likert using a survey to provide common measures to assess learning experience. Data were also collected through learners' comments and direct observation. One hundred and five students and seven instructors from Kogi State Polytechnic participated in this study. The validity and consistency of the Likert scales were tested using the Cronbach alpha coefficient. Using a scale of means, standard deviation, confidence interval, and sentiment analysis we gained insight into learners' experience. The result showed that content quality, content layout, assimilation, motivation, engagement, and attractiveness vary with online learning environments. Interestingly, how the learners perceive the online platform is a strong indicator for deciding the success or failure of the learning outcomes.*

**Keywords:** Content layout, online learning, Likert scale, user experience, satisfaction, multimedia.

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## 1. INTRODUCTION

Recent years have witnessed an evolution in online learning with schools embracing Learning Management System (LMS), multimedia, and video-conferencing (Andrade et. al, 2014; Sutadji et. al, 2020). The Covid-19 pandemic led to schools being shut to traditional face-to-face learning. While the gates and doors to the physical classroom were shut, the viable alternative was online learning. Schools explored online platforms such as Google classroom,

WhatsApp, Zoom, and other online platforms for teaching and learning (Serhan, 2020; Mpungose, 2020). There have been few attempts to measure learners' experience and gain insight to features that influence online learners.

Learner experience is coined from User Experience (UX), a sub-branch of Human-Computer Interaction (HCI). According to Zaharias & Mehlenbacher (2012), User Experience focuses on the expectations and needs of the user; usability, functionality, and

accessibility of software developed for a specific purpose. Learning experience entails understanding how best technology can be designed to meet the educational needs of learners, usability, and satisfaction. To ensure that the purpose of learning is achieved, certain User Experience (UX) criteria must be considered in selecting a suitable online learning platform.

Exploring user experience in online learning platforms is not restrained to deploring the latest e-learning technologies or software functionalities. The overall success of an online learning platform hinges on the ease of use, disposition of the learner while using the platform, the ability to understand and retain content delivered on the platform. Learners who are the primary users of the online learning platforms are considered in deciding which platform(s) to use.

The paper aims to know learners from Kogi State Polytechnic experience on WhatsApp, Google Classroom, and Zoom. This paper clearly defined objectives to achieve the stated aim. Firstly, to measure the effectiveness of the e-learning platforms by evaluating students' understanding of lecture contents delivered via video, audio, and text. Secondly, to conduct a survey amongst the learners to determine their learning experience on the selected three e-learning platforms. Furthermore, a comparative analysis of three online platforms namely: Zoom, Google Classroom, and WhatsApp to determine learners' preferences, suitable content format, and usability.

Learning is tailored to attract and retain engagement. To encourage active engagement and a positive disposition to e-learning, the user experience must be a priority in designing and selecting online learning platforms. A seamless, learner-friendly, intuitive, and non-obtuse online learning environment will impact and retain the knowledge taught.

## 2. RELATED WORK

Olasunkanmi (2020) carried out an empirical study among one hundred and four students from Anchor University, Nigeria to ascertain their disposition to online learning during the COVID-19 pandemic lockdown. The outcome of the study showed a negative disposition to online learning by the students; preferred on-site classroom learning and repetition of content delivered via online platform when school resumes on-campus. However, the study failed to measure specific learning experiences and usability issues associated with the e-learning platforms used.

Adeoye et.al. (2020) posited that the factors militating against e-learning in Nigerian higher education are irregular electricity supply, low allocation to education in the national budget, and high cost or poor connectivity of internet data services. The authors were unable to present the possibility of exploring readily available learning applications easily accessible to Nigerian students for online learning. WhatsApp is one of the most used instant messaging apps among Nigerian students and it is viable in enhancing learning through discussion (Igbafe & Anyanwu, 2018). The possible human factors which revolve around the learner experience were not considered in the study.

Elmunyah et.al. (2020) analysed Generation Z's User Interface (UI) and user experience on personal online training systems using descriptive quantitative methods. The study used a 0-7 Likert scale questionnaire. The outcome showed that the user interface was friendly for tech-savvy learners. Nonetheless, the paper did not state specifically the features of the UI that made the learning management system friendly. This is a limitation to the study.

Kocabali, Laranjo, and Coiera (2018) reviewed pieces of literature and compared five commonly used standardized questionnaires for measuring dimensions in User Experience (UX) to ascertain their suitability for conversational interfaces. The selected questionnaires measured hedonic, aesthetic, pragmatic, affect, and frustration dimensions. The results showed that none of the questionnaires can measure all UX dimensions. The study recommends either adopting a questionnaire to measure specific UX dimensions or a combination of questionnaires to measure a wide range of UX dimensions. However, in practicality, the questionnaires become too bulky for people and affect the quality of data provided.

Santoso et. al. (2016) developed an adapted Indonesian version of the User Experienced Questionnaire (UEQ) which was used to evaluate a learning management system. The questionnaire measured attractiveness, efficiency, perspicuity, dependability, stimulation, and novelty. The results from the evaluated learning management system showed prevalent challenges in the system, most important and least important features. The output of the research provides insights to make the learning system better for the learners. Nonetheless, similar studies need to be carried out with other digital tools adapted for learning and learners' preferences for content formats such as text, audio, and video.

Ghazali and Nordin (2019) conducted an empirical study to identify factors that measure meaningful

learning experiences amongst university students in Malaysia. The study focused primarily on six dimensions, namely: active learning, cooperative learning, constructive learning, authentic learning, constructive learning, and intentional learning. Data collected via the questionnaires were analysed using confirmatory factor analysis. The result established that the identified dimensions play a vital role in meaning learning. The identified dimensions were not properly related to online learning or how online learning can adapt these dimensions to enhance an online learning experience, this is a limitation.

Sutadji et.al. (2020) carried out an empirical study that measured user experience on the Universitas Negeri Malang's e-learning platform called SIPEJAR. The authors used a Likert scale adapted from the User Experience Question framework which was included in the instrument for data collection. The result showed that the user experience on the learning management system is low due to poor interface layout and material presentation. The low acceptability of the LMS can be attributed to the poor user experience. Consequently, this study should be replicated on other learning platforms.

Powell and Leary (2021) developed a survey instrument to measure youth's experiences connected learning to achieve personal pursuit through digital media. Map constructs were created and survey instruments administered. The study showed the need for program-specific measures to accommodate variations not captured in standardized measures. This aligned with our research which adapted the survey instruments to reflect the selected learning platforms. The problem with new measures is the validity and replication of the instruments.

Aftab and Andy (2017) conducted a study among students in the United Kingdom higher education to understand student experience using the Blackboard learning platform. The result of the study gave clues on how Blackboard virtual learning can be improved for a better learning experience. Comparison between Blackboard virtual learning and other available online learning platforms were not made to determine suitability. In addition, the study is silent in addressing usability-related issues with the selected virtual learning platform.

Previous works of literature have made immense contributions to online learning. Nevertheless, measuring learning experience and empirical study to highlight qualities are underrepresented.

### 3. METHODOLOGY

#### *Selection of Participants*

Seven instructors from Kogi State Polytechnic, Lokoja were recruited whose specialties were in Art and Industrial Design, General Studies, Business mathematics, Computer Science, Science and Technological Laboratory, Engineering, and Environmental Studies. The instructors were saddled with the responsibilities to recruit online learners from their classes, add learners to the selected platforms, teach topics from their allocated courses for the semester on the platforms, and give feedback.

Students were selected from seven different departments within Kogi State Polytechnic, Lokoja. Fifteen students from each department were chosen to make a total of one hundred and five online learners. Efforts were made to ensure the sample comprises above average, average, below average, and low-resource students.

#### *Choice of Online Learning Platforms*

In 2020, the closure of schools to curtail the spread of COVID-19 led to migrating learning online. Online learning was not in use in many institutions including Kogi State Polytechnic before the lockdown. Hence, institution-based Learning Management Systems (LMS) were not available to meet the urgent need for e-learning. Softwares such as WhatsApp, Google Classroom, and Zoom were alternatives. The instructors taught learners selected for this study using the three platforms.

#### *Adopting Learning Content Formats*

The study explored different content formats such as video, chats/texts, audio, and documents (pdf and doc formats). These digital content formats are possible on online learning platforms.

#### *Qualities for Measurement*

Qualities for determining the learning experiences combined qualities from education and user experience. Course design, quality of content, engagement, and knowledge acquired are considered important for online learning (Mourali, et. al. 2020, Morris, et.al 2021).

#### *Survey Instrument and Data Collection*

A 35-item questionnaire was designed using Google Form and administered for the participants to collect data. The questions were divided into four categories. The first category captured background data such as the course taught on the platforms, gender, computing device used for online learning, accessibility to the internet, location during the online learning, preferred learning format. The second category allowed participants to rate their learning on WhatsApp. Likert scale of range -2 to +2 was used to measure the quality of learning content delivered WhatsApp for

learning, content layout on the platform, quality of lecture content delivered on the platform, assimilation (ability to understand concepts taught), motivation to learn on the platform, engagement with instructors and other learners, and attractiveness of the learning platform. The third and fourth sessions were similar to the second session, except that they collected data about the Zoom application and Google Classroom respectively. Data were collected via an online survey, interviews, and observation during the classes.

#### Data Analysis

Collected data were transformed, -2 and -1 implied negative measure, 0 means neutral, while +1 and +2 translated to positive for the qualities being measured. Incomplete data were deleted to avoid a negative effect on the result. Descriptive analysis, correlation, and sentiment analysis using Azure machine learning were analytical tools employed. Cronbach alpha was used to verify the reliability of the Likert scale and learners' responses.

#### 4. RESULTS

Standardized Cronbach's alpha coefficient was computed for each scale to ascertain the consistency and reliability in the chosen learning experience scale. Cronbach's coefficient ranges from 0 to 1 and the closer the value is to 1.0 the greater the reliability (Gliem & Gliem, 2003). The result of the Cronbach alpha analysis in Table 1 showed high consistency values for the three selected learning platforms except for engagement in Zoom which has a value closer to 0 than 1. This is attributed to misinterpretation of interaction amongst learners on the Zoom app by the learners. Overall, the scales have a satisfactory level of construct validity and internal consistency.

The instructors observed that learners in areas where internet connectivity was not reliable or with low-quality computing devices could not cope with using the three selected apps. This category of students was absent in most classes.

The error bars in Figure 1 represent the 95% confidence intervals of the scale means and the short bars (small confidence intervals) denote the accurately measured scales. The user experience questionnaire is broadly classified into pragmatic and hedonic (Santoso et.al. 2016). The Hedonic presents qualities that have no obvious relation to the task the learner intends to accomplish with the online learning platform while pragmatic correlates with the tasks the learner intends to carry out in the online learning platform (Kujala, Roto, , Väänänen-Vainio-Mattila., & Sinnelä, 2011)). The learner experience scales

adopted for this study were classified based on their functionalities to the Quality of content, content layout, and Assimilation were grouped as pragmatic while motivation and engagement were grouped as hedonic.

Figure 2 shows that WhatsApp has the highest in terms of attractiveness, pragmatic, and hedonic; Google Classroom is next to WhatsApp while Zoom has the least compared to the other platforms.

The bar chart in Figure 3 showed that 64 of the learners used medium screen size mobile phones to access online learning content, 11 of the learners used large while 7 used small screen devices. This illustrates the popularity of medium screen phones amongst the learners.

As shown in Figure 4, 77 of the learners accessed their learning content using mobile phones, 1 learner used a laptop while 4 learners used both mobile phones and laptops.

Figure 5 shows that majority of the learners had access to either strong or average internet signals. However, a fraction of the learners were in areas where it was difficult to access internet connectivity.

The result in Figure 6 showed that learners' favorite learning mode was text-based chats, followed by voice notes while documents were the least preferred learning formats. Also, some of the learners had preferences for a blend of all possible content formats for a better learning experience.

The chart in Figure 7 shows that learners preferred to use both videos on and off features on Zoom depending on the need and nature of contents being taught while using the platform.

The learners' opinions about online learning were gathered in text format and categorized into three using Azure machine learning to get students' attitudes and sentiments. The table contains three types of moods displayed by the learners namely negative, neutral, and positive using sentiment analysis. Negative sentiment shows learners' dislike for online learning, neutral sentiment shows learners' indifference to online learning while positive sentiment shows learners' acceptance or like for online learning. Individual scores for each learner are summed for the three categories.

Figure 8 shows that a larger percentage had an overall positive disposition to online learning. The negative and neutral dispositions to online learning were represented in the chart as shown. The learners' opinions about online learning were gathered in text

format and categorized into three using Azure machine learning to get students' attitudes and sentiments.

## 5. DISCUSSION OF FINDINGS

The purpose of this study was to gain a better understanding of how learning experience can be maximized in learning environments. Using the 5-point Likert scale to measure learners' experiences and survey gave insights into best practices to meet learners' needs while learning online.

These data from the measurement, survey, and direct observation have some potential intervention implications. For instance, one of the findings showed that most students are confident learning with mobile phones. This finding is further supported by Thornton & Houser (2005) work that showed that students drawn from a Japanese university preferred using mobile phones for learning English. Learning institutions designing and developing learning management systems must ensure that the applications are mobile-friendly to enhance learning experiences.

### *Comparison between WhatsApp, Google Classroom, and Zoom*

WhatsApp was the most preferred platform in terms of quality of content, content layout, assimilation, engagement, motivation, and attractiveness while Zoom is the least preferred amongst the three selected apps. This pattern of result is consistent with the previous literature where first-year students in a South Africa University preferred learning via WhatsApp to Moodle (Mpungose, 2020). WhatsApp preference could be attributed to the high usage of mobile phones by the learners and prior experience with the app being a social media platform. Further investigation showed that WhatsApp consumes less data and does not drain computing device battery quickly compared to Zoom (Om & Tucker, 2018). To reduce the data consumption and device battery pain points in learning environments, developers of learning apps should put into consideration lightweight and energy-saving best practices.

Learners preferred Google Classroom for assignments, discussion forums, and reminders. Discussion forums were the most engaging feature by the learners. Initial technical glitches were observed with learners understanding the Google Classroom interface. The learners brought their prior experience from chatting on social media platforms to discussion forums. The challenge with chat-based interaction and

learning is that old posts are shadowed by new posts making it difficult to keep track of vital learning resources shared. Educators and developers should partition key posts and resources for easy navigation. Further investigation to decline in content engagement by learners showed that large content which requires longer time to read or watch can easily be dumped in Google Classroom by integrating other applications such as YouTube and Google Drive.

The six indices for Zoom were the lowest compared to WhatsApp and Google classroom, motivation and engagement were lower than other scales. The learners perceived Zoom as a valuable video-conferencing tool for learning that mimics the traditional face-to-face classroom. However, interaction and feedback declined with a larger number of online participants. Our findings corroborate with the outcome of Serhan (2020) study on students' attitude and perception using zoom for learning during the Covid-19 pandemic. The author showed that learners' participation on Zoom was low. On the contrary, Wang et al. (2018) study found students enjoyed the flexibility and convenience Zoom offers. The video-conferencing app has features to split participants into sub-groups to enhance optimal interaction. Hence, Zoom and video-conferencing features should serve as complementary learning platforms.

### *Content Format and Multimedia*

Information presented was varied using text/chats, audio/voice notes, videos, and documents in pdf formats. Generally, learners engaged more and easily assimilate with small chunk content than large chunk content. High engagements, motivation, assimilation were witnessed with short texts and voice notes (less than 5 minutes). However, complimentary visuals were needed in courses that required calculations, and illustrations. Videos and images boost the quality of content presented to learners. Nonetheless, background noise in audio and video reduced learners' motivation. Overall, content format and multimedia contribute to learners' experience. Andrade (2014) suggests varieties of multimedia online course materials for efficient learning; this aligns with the discovery in this study.

### *Satisfaction*

The attractiveness, pragmatic, hedonic, and positive sentiment outcomes showed that learners have a good disposition to online learning if contents and interfaces are designed with the users in mind. Whereas past researchers did not establish a correlation between learners' experience, quality of

content, content layout, engagement, and understanding concept taught on online platforms (Wang et.al, 2018; Aftab & Andy, 2017), the present study has shown that these qualities impact learning. One of the issues that emerge from these findings is that prior experience with WhatsApp contributed to the learners' acceptability and motivation. Hence, we can infer that schools start off with a hybrid of online and traditional classroom learning. This gives designers, developers, teachers, and learners ample time to be conversant with the learning platforms, redesign necessary features, and ease transition to fully online learning when occasion arises. This same thought was shared by Wang et. al. (2018) who opined that blended learning paves way for robust e-learning.

## 6. FUTURE WORK AND CONCLUSION

Although this paper supports measuring learners' experience to discover how to tailor online learning to meet students' needs (knowledge and satisfaction), the research contribution raises a variety of intriguing questions for future study. How do we design online learning platforms with considerations for learning disabilities and low-quality computing devices? It would be useful to extend the current findings by further exploring pain points and learners' behaviour using log analysis, eye tracking, and diary studies.

This study set out to measure learners' experiences in online learning environments using a 5- point Likert scale, survey, and qualitative method. The findings have shown varieties of features such as multimedia course materials, target application platforms, design considerations, and tips for e-learning platform developers. A limitation of this study is that the data gathered majorly relied on feedbacks provided by learners and instructors which may be susceptible to selective memory. Despite the limitation, the insights gained have gone some way towards enhancing our understanding of learner experiences.

### Acknowledgment

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## REFERENCES

- [1] Adeoye, I. A. Adanikin, A. F. Adanikin, A. (2020). 'COVID-19 and E-Learning: Nigeria Tertiary Education System Experience', *International Journal of Research and Innovation in Applied Science*, Vol. V, issue V, pp. 28-31.
- [2] Aftab, D. & Andy, L. (2017). 'Student Experience of E-Learning Tools in HE: An Integrated Learning Framework', *European Journal of Social Sciences Education and Research*, Vol. 11, Issue 2, pp. 39-51.
- [3] Andrade, J., David Huang, W. H., & Bohn, D. M. (2014). 'Multimedia's Effect on College Students' Quantitative Mental Effort Scores and Qualitative Extraneous Cognitive Load Responses in a Food Science and Human Nutrition Course', *Journal of Food Science Education*, Vol.13, Issue 3, pp. 40-46.
- [4] Baki Kocaballi, A., Laranjo, L., & Coiera, E. (2018). Measuring User Experience in Conversational Interfaces: A Comparison of Six Questionnaires. *2018 32nd International BCS Human-Computer Interaction Conference*, Belfast-United Kingdom, pp.1-12.
- [5] Elmunsyah, H., Hidayat, W. N., Ulfa, S., Surakhman, E., & Wakhidah, R. (2020). Measuring User Experience on Personalized Online Training System to Support Online Learning. *2020 1st Annual Technology, Applied Science, and Engineering Conference*, East Java-Indonesia, pp.1-6.
- [6] Ghazali, N., & Nordin, M. S. (2019). 'Measuring Meaningful Learning Experience: Confirmatory Factor Analysis', *International Journal of Innovation, Creativity, and Change*, Vol.9, Issue 12, pp. 283-296.
- [7] Gliem, J. A., & Gliem, R. R. (2003). Calculating, Interpreting, and Reporting Cronbach's Alpha Reliability Coefficient for Likert-Type Scales. *2003 2nd Midwest Research to Practice Conference in Adult, Continuing, and Community Education*, Columbus-Ohio, pp. 82-88.
- [8] Igbafe, E. C. & Anyanwu, C. N. (2018). 'WhatsApp at Tertiary Education Institution in Nigeria: The Dichotomy of Academic Disruption or Academic Performance Enhancer?', *The Journal of Pan African Studies*. Vol. 12, Issue 2, pp. 179+ .
- [9] Landauer, T.K., Galotti, K.M., and Hartwell, S. (1983). 'Natural Command Names and Initial Learning: A study of text-editing terms', *Communication of ACM*, Vo.26, Issue 7, pp. 495-503.
- [10] Morris, E., Farrel, A. et. al (2021). A Roadmap for Measuring Distance Learning. USA: United States Agency for International Development.

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<https://afrijmis.net>

- [11] Mourali, Y., Agrebi, M., Farhat, R., Ezzedine, H., & Jemni, M. (2021). 'Learning Analytics Metrics into Online Course's Critical Success Factors', *Advances in Intelligent Systems and Computing-Springer Science and Business Media Deutschland GmbH*, Vol. 1366, pp. 161–170.
- [12] Mpungose, C. B. (2020). 'Is Moodle or WhatsApp the preferred e-learning platform at a South African university? First-year students' experiences', *Education and Information Technologies*, Vol.25, Issue 2, pp.927–941.
- [13] Olasunkanmi Israel (25 August, 2020).Nigeria: Nigerian University Students Find Online Learning Painful – Here's Why <https://thestreetjournal.org/2020/08/nigeria-nigerian-university-students-find-online-learning-painful-heres-why/>
- [14] Om, S., & Tucker, W. D. (2018). Battery and Data Drain of Over-the-top Applications on Low-end Smartphones. 2018 IST-Africa Week Conference, Institute of Electrical and Electronics Engineers Inc, Botswana, pp. 1-12.
- [15] Powell, S. T., & Leary, H. (2021). 'Measuring Learner–content Interaction in Digitally Augmented Learning Experiences', *Distance Education*. Vol.42, Issue 4, pp.520-546.
- [16] Santoso, H. B., Schrepp, M., Yugo Kartono Isal, R., Utomo, A. Y., & Priyogi, B. (2016). 'Measuring User Experience of the Student-Centered E-learning Environment', *Journal of Educators Online*, Vol.13, Issue 1, pp. 1–79.
- [17] Serhan, D. (2020). 'Transitioning from Face-to-Face to Remote Learning: Students' Attitudes and Perceptions of using Zoom during COVID-19 Pandemic', *International Journal of Technology in Education and Science*, Vol.4, Issue 4, pp. 335–342.
- [18] Sutadji, E., Hidayat, W. N., Patmanthara, S., Sulton, S., Jabari, N. A. M., & Irsyad, M. (2020). Measuring User Experience on SIPEJAR as E-learning of Universitas Negeri Malang. In *IOP Conference Series: Materials Science and Engineering* (Vol. 732). Institute of Physics Publishing.
- [19] Thornton, P., & Houser, C. (2005). 'Using Mobile Phones in English Education in Japan', *Journal of Computer Assisted Learning*, Vol. 21, pp. 217–228.
- [20] Wang, Q., Huang, C., & Quek, C. L. (2018). 'Students' Perspectives on the Design and Implementation of a Blended Synchronous Learning Environment', *Australasian Journal of Educational Technology*, Vol.34, Issue 1, pp. 1- 13.
- [21] Zaharias, P. & Mehlenbacher, B. (2012). 'Exploring User Experience (UX) in Virtual Learning Environments', *International Journal of Human-Computer Studies*, Vol. 70, Issue 7, pp. 475 – 477.
- [22] Kujala, S., Roto, V., Väänänen-Vainio-Mattila, K., & Sinnelä, A. (2011). Identifying Hedonic Factors in Long-term User Experience. 2011 *Designing Pleasurable Products and Interfaces, Proceedings*, Milano-Italy, pp. 1-8.

Table 1: Results of correlation and Cronbach alpha coefficient from LX questionnaire.

SCALE	WHATSAPP		ZOOM		GOOGLE CLASSROOM	
	Correlation	Cronbach alpha	Correlation	Cronbach alpha	Correlation	Cronbach alpha
Quality of Content	0.80	0.96	0.68	0.93	0.70	0.93
Content Layout	0.85	0.97	0.82	0.96	0.80	0.96
Assimilation	0.60	0.90	0.66	0.92	0.74	0.95
Motivation	0.75	0.95	0.76	0.95	0.79	0.96
Engagement	0.82	0.96	0.55	0.03	0.77	0.95
Attractiveness	0.77	0.95	0.79	0.96	0.79	0.96

Table 2: Results from the Learning Experience Questionnaire (LEQ) for WhatsApp.

SCALE	LEQ	VARIANCE	STD. DEV	CONFIDENCE
Quality of Content	1.423	0.936	0.967	0.213
Content Layout	1.380	0.926	0.962	0.212
Assimilation	1.410	0.745	0.863	0.190
Motivation	1.420	0.803	0.896	0.198
Engagement	1.436	0.859	0.927	0.204
Attractiveness	1.402	0.864	0.929	0.205

Table 3: Results from the Learning Experience Questionnaire (LEQ) for Zoom

SCALE	LEQ	VARIANCE	STD. DEV	CONFIDENCE
Quality of Content	1.295	0.905	0.952	0.210
Content Layout	1.192	1.131	1.064	0.235
Assimilation	1.237	1.005	1.002	0.221
Motivation	1.128	1.181	1.087	0.240
Engagement	1.160	1.062	1.030	0.227
Attractiveness	1.192	1.138	1.067	0.235

Table 4: Results from the Learning Experience Questionnaire (LEQ) for Google Classroom

SCALE	LEQ	VARIANCE	STD. DEV	CONFIDENCE
Quality of Content	1.269	1.061	1.030	0.227
Content Layout	1.291	0.997	0.998	0.220
Assimilation	1.283	1.022	1.022	0.225
Motivation	1.304	0.939	0.939	0.207
Engagement	1.359	0.950	0.950	0.209
Attractiveness	1.359	0.950	0.950	0.209

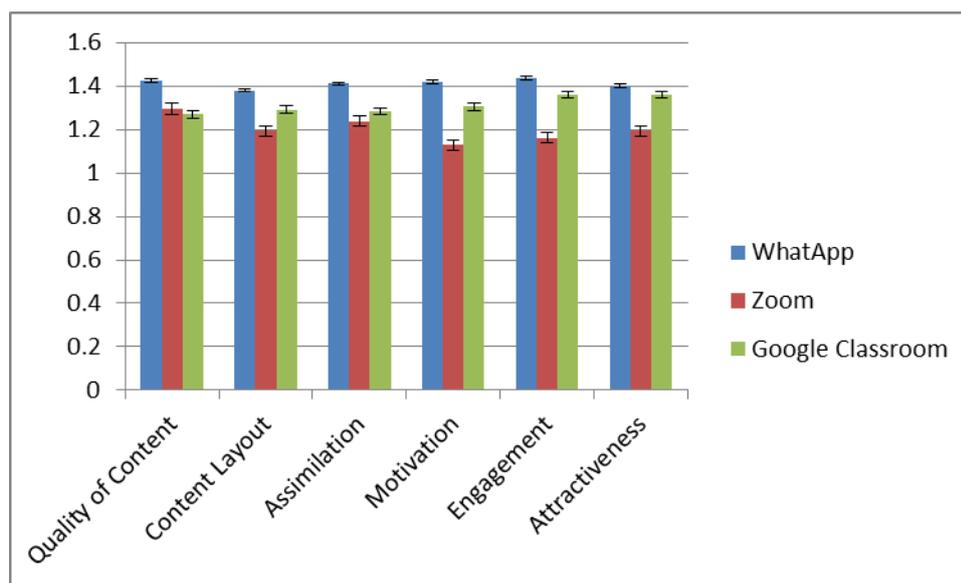


Figure 1: Scale of means for WhatsApp, Zoom, and Google Classroom.

Table 5: Equivalent of User Experience for the Learning Experience Scale.

Qualities	WhatsApp	Zoom	Google Classroom
Attractiveness	1.402	1.192	1.359
Pragmatic	1.405	1.241	1.281
Hedronic	1.428	1.144	1.332

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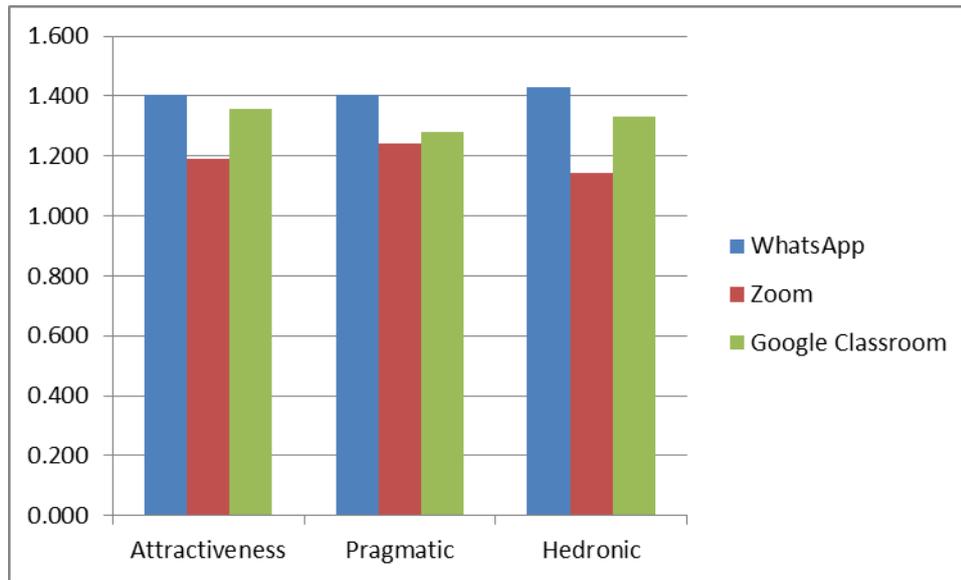


Figure 2: User Experience for the Learning Experience scales.

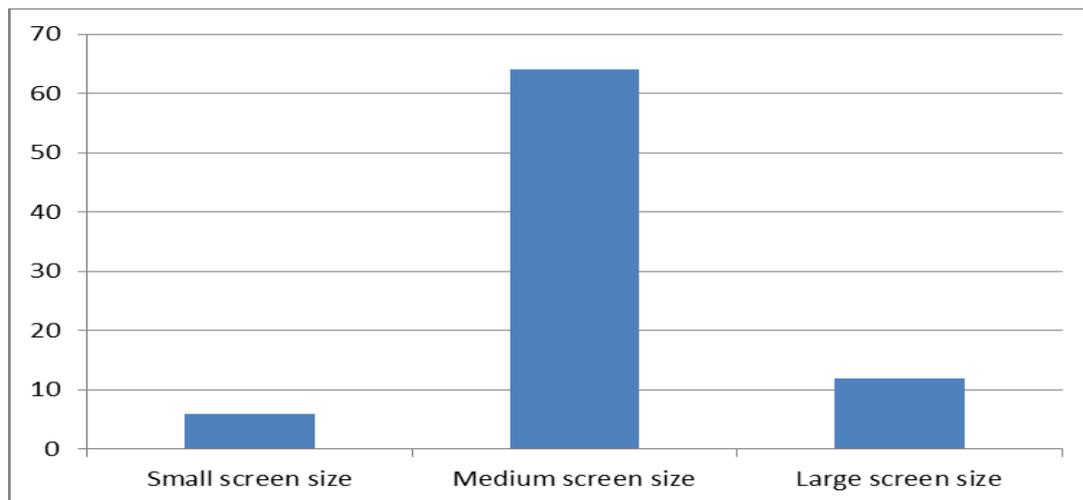


Figure 3: Device used to access online learning content.

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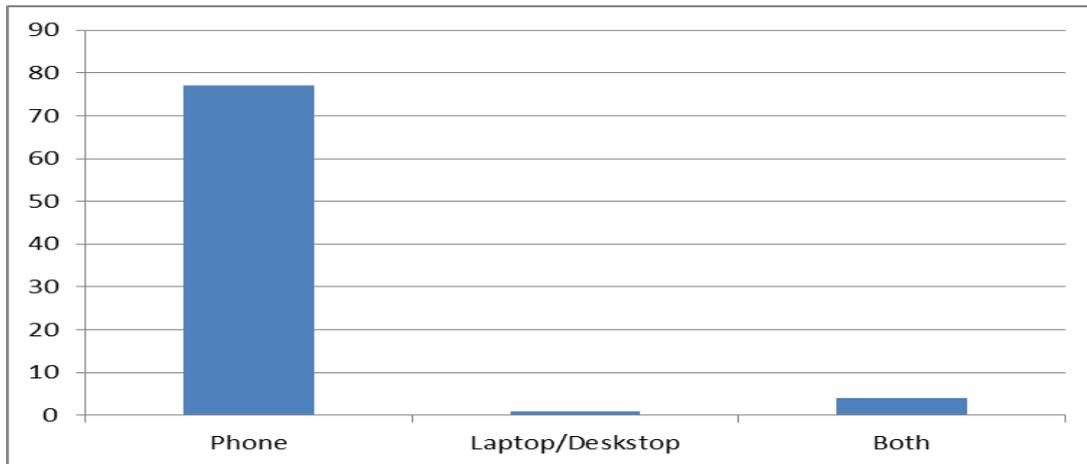


Figure 4: Computing devices used to access learning contents.

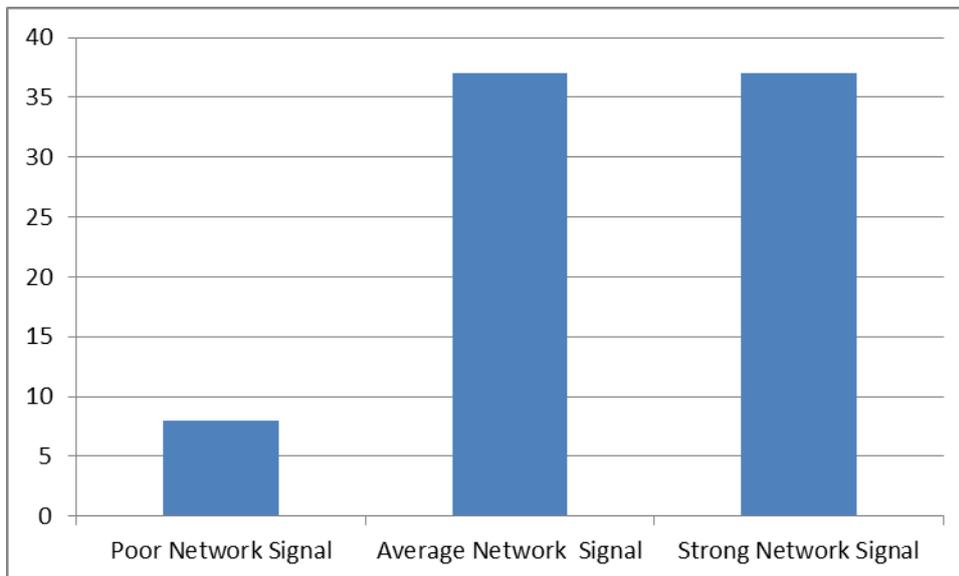


Figure 5: Learners' access to the internet during online classes.

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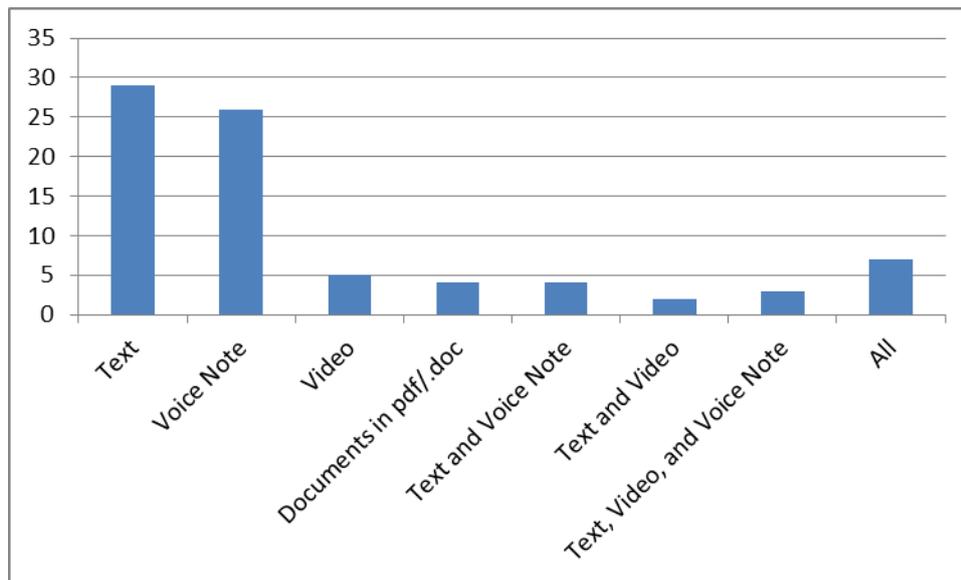


Figure 6: Preferred learning formats on WhatsApp.

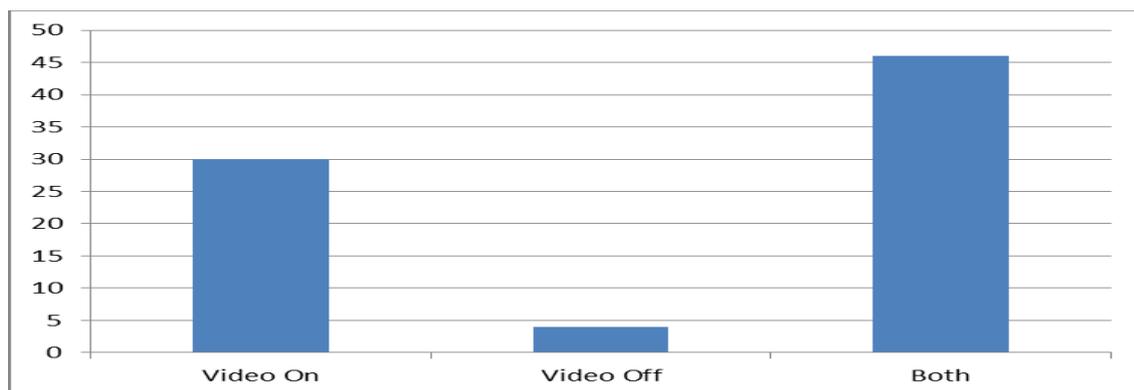


Figure 7: Preferred learning formats via Zoom.

Table 6: Sentiment values for student disposition to online learning

Sentiment	Sum of Score
Negative	6.243
Neutral	6.048
Positive	34.568

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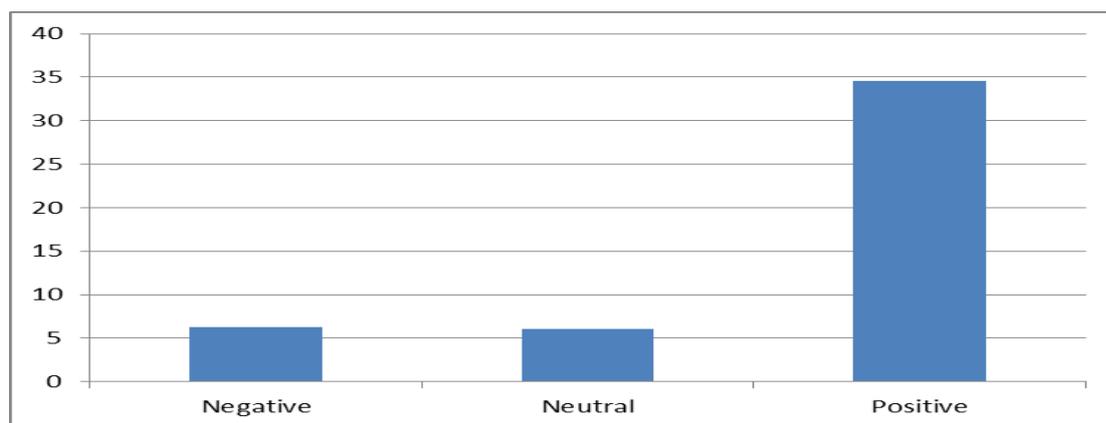


Figure 8: Learner experience mood to online learning.