Needs Analysis For the Development Of Website-Based Interactive Infographic Modules in Arabic Grammar Learning

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Abstract
Technology in learning Arabic grammar can help students understand more easily and with fewer difficulties. Infographics are one of the alternatives of today's technology that aim to make learning information simple, exciting, and easy to understand. This study focuses on students' views on the need to develop web-based interactive infographic modules in learning Arabic grammar. This study uses the Design and Development Research approach. Researchers used questionnaire instruments to obtain analysis data related to learning materials, learning approach issues, the tendency to utilize innovation, and the need to use interactive infographics. A total of 205 students from Bachelor of Arabic Studies, UniSZA, who had taken Ibn Aqil's Syntax Text study, were made to be respondents that answered the questionnaire. Data were analyzed using the Statistical Package for Social Science (SPSS) software to obtain the mean and standard deviation. Interactive infographic content can attract students to understand complex lessons, and it should be developed.
Keywords: Arabic Grammar; Interactive Infographics; Technology; Website.

INTRODUCTION

The objective of learning a language's approach is to practise language proficiency without making mistakes (Abdul Hamid et al., 2020). Similar to Arabic, teaching and learning (TnL) places a strong emphasis on grammatical acquisition. Every language in the world, notably Arabic, is highly concerned with grammar in order to guarantee that the language is utilised correctly and accurately, claimed Abdul Karim et al. (2020). The grammar that serves as the foundation for the Arabic language's rules determines whether or not the Arabic language will serve its intended purpose (Jaffar & Sha'ari, 2016). According to Syed Ab Hamid et al. (2017), the weakness of mastery of the Arabic language as a whole is the result of failing to understand grammar well. The TnL method of Arabic grammar still focuses on the explanation of the textbook by the teacher and involves less two-way interaction. This is not in line with current developments, especially for generation Z students who prefer interactive learning, innovation and a variety of technology-based teaching aids. One factor contributing to this issue is the TnL methodology of Arabic grammar, which is synonymous with method and incorporates teacher-centred learning (Zaini et al., 2019). Due to teaching methods that are sometimes

unfocused and stagnant, particularly for non-native students who adhere to traditional and static learning styles, the discussion surrounding Arabic grammar is very broad (Husin et al., 2017). Arabic textbooks are filled with in-depth information that is given in the form of lengthy descriptions, which causes the content to be disorganised. This circumstance adds to the students' disinterest in studying the book's material further. As a result, the part that instructional materials perform is crucial in clarifying and improving learning measurement (Sjahrony et al., 2017).

Although the natural characteristics of the Arabic grammar method are complex, it does not mean that mastery of it is limited. Various teaching methodologies in TnL Arabic grammar have been practiced by teachers. However, the selection of a creative and appropriate approach needs to be widely practiced in line with current technological developments. This is able to impact TnL activities in addition to achieving the desired objectives (Ismail et al., 2018). Diverse learning methods and the use of learning aids that suit the student's ability need to be taken into account (Jamaluddin & Baharudin, 2021). An interactive and innovative teaching approach is more suitable and popular with students in this current era as compared to traditional methods that only focus on the teacher. One of the alternatives in practicing the approach is through the use of multimedia that acts as a teaching aid (Sallehin & Ab Halim, 2018). The use of multimedia can be practiced through the presentation of information through infographics. Information is presented in attractive graphics. According to a 2017 study by Mohd Noh et al., students are more likely to comprehend material when it is presented to them visually and through an appealing graphic combination. According to them, any information communicated must emphasise the use of attractive colours in conjunction with straightforward, understandable text, supported by pertinent diagrams, charts, or tables, in order to create an organised and efficient information display. The website will be used to develop the use of interactive infographics in this study. Students' interest in comprehending complex information, such knowledge on Arabic grammar, can be piqued through the interactive use of infographics. Students can select the content they want to focus on and can concentrate on with interactive infographics (Dur, 2014).

METHOD

This study uses a DDR approach that aims to promote the knowledge base of researchers and creativity in design and development by involving them in all phases of the design and development process, namely requirements analysis, design, development and evaluation (Siraj et al., 2020). The needs analysis phase is one of the key stages in this process. Prior to bringing the design and development process into action, this phase seeks to determine the model or module's development needs. In addition, the implementation of this phase is to evaluate the needs to be studied and then will determine the result of the results to be obtained. According to McKillip (1987), the process of analysing needs is also known as the process of identifying problems found among the selected population (target population). The needs analysis process also involves the process of identifying the most appropriate and best method to solve an issue in the study (Witkin & Altschuld, 1995). Needs analysis is important because research questions will be able to be explained and used to develop modules (Mohd Jamil & Mat Noh, 2020).

This study uses a questionnaire instrument for the needs analysis phase to identify the needs in developing an interactive infographic module based on students' views using the Design and Development (DDR) approach (Richey & Klein, 2007). This approach

involves the requirement analysis phase as the first phase before the module design phase is implemented. This study involved 205 students as respondents. These are students who have completed the required course for ISM Arabic Studies at UniSZA, Ibn 'Aqil's Syntax Text Study. This course is offered in the third semester of the study programme. Convenience sampling is the method used to choose the study's sample. This sampling strategy is conveniently accessible for gathering study participant input and works well with readiness-based studies.

The instrument used in the first phase of the study is a questionnaire. A set of needs analysis questionnaires were distributed online to get students' feedback and views on the extent of the need for the development of an animated infographic module in Arabic grammar learning at UniSZA. The questionnaire used is a structured questionnaire that is modified based on the questionnaire instrument for the study of module design and technology. This questionnaire contains five parts, namely part A related to demographic information, while parts B, C, D, E contain five Likert scale questions, namely (1) Strongly Disagree (2) Disagree (3) Not Sure (4) Agree (5) Strongly agree. This section is related to aspects of the use of learning materials, learning approach issues, the tendency to use innovation and the need to use interactive infographics in learning Arabic grammar. Data from a series of online questionnaires given to 205 UniSZA Arabic Studies ISM students were analysed as part of the needs analysis phase. Statistical Package for Social Science (SPSS) software version 23 was used for data analysis. The mean and standard deviation were used in a descriptive analysis that was performed. Based on students' perspectives, the descriptive analysis results were utilised to assess the necessity of an interactive graphical module for learning Arabic grammar. The mean score and standard deviation were analysed to obtain the level of student agreement. Mean interpretation scale obtained from Nunnally and Bernstein, (1994) as in Table 1.

Table 1. Mean Interpretation Value

Mean Score	Interpretation
1.00 – 2.00	Low
2.01 – 3.00	Average
3.01 – 4.00	Above Average
4.01 – 5.00	High

Source: Nunnally dan Bernstein (1994)

RESULTS AND DISCUSSION
Use Of Learning Materials

The following result in Table 2 shows the mean score and standard deviation of the respondents' feedback on the use of learning materials.

Table 2. Use of Learning Materials

	B: Use of Learning Materials	Mean	SD	Interpretation
B1	I use the main reference book	3.99	.962	Above Average
B2	I use additional reference books	3.77	.904	Above Average
B3	I use library materials	3.09	0.998	Above Average
B4	I use internet materials	4.56	.681	High
B5	I use simple notes made by myself	3.90	.860	Above Average
B6	I use a computer software to study	3.98	.896	Above Average
B7	I use graphic note summaries	4.16	.825	High
B8	I used the notes shared by the lecturer	4.58	.686	High
B9	I use an interactive website	4.15	.793	High
	Average	**4.02**	**.845**	**High**

Table 2 shows that the interpretation of the data for the aspect of the use of learning materials by students is at a high level, which is at an overall mean value of 4.02 and a standard deviation of .845. Based on the analysis of this data, it is known that students use learning materials that support their learning activities at a high level. The use of notes shared by the lecturer recorded the highest mean score, which is (M=4.58, SD= .686) followed by the use of internet materials (M=4.56, SD= .681). The use of graphic note summaries (M=4.16, SD=.825) and the use of interactive websites (M=4.15, SD= .793) as learning materials also recorded a high mean score.

The use of learning materials that shows an above average level is the use of the main reference book with the value of (M=3.99, SD=.962), followed by the use of computer software to learn with values of (M=3.98, SD=.896). This was followed by the use of self-made simple notes with the values of (M=3.90, SD=.860) and the use of additional reference books (M=3.77, SD=.904). The use of library materials recorded the lowest mean score value, which is (M=3.09, SD=0.998). However, all items recorded mean values at high and above average levels only.

Learning Approach Issues

The second question in this study is 'What are the learning approach issues faced by students?'. The following result in Table 3 shows the mean score and standard deviation of the respondents' feedback on learning approach issues.

Table 3. Learning Approach Issues

	C: Learning Approach Issues	**Mean**	**SD**	**Interpretation**
C1	Traditional teaching (full explanation by the teacher) is not enough to understand the course content	3.40	1.118	Above Average
C2	Difficulty connecting with lecturers and friends outside the lecture	3.03	1.129	Above Average
C3	Limited time to delve into topics during lectures	3.72	1.061	Above Average
C4	A large measure of topics	3.45	1.122	Above Average
C5	Complex teaching information and notes	3.56	1.025	Above Average
C6	Lack of electronic material on the internet	3.04	1.143	Above Average
C7	High cost of additional reference materials	3.05	1.119	Above Average
C8	There are no complete teaching aids	2.72	1.114	Average
C9	No interactive website learning materials	2.86	1.134	Average
	Average	**3.203**	**1.1072**	**Above Average**

Data interpretation for Table 3 above is related to the issues of learning approach faced by students. The learning approach issues faced by students as a whole are at an above average level with a mean score of 3.203 and a standard deviation of 1.1072. Two items recorded a mean score that was at a medium level, namely the item "no interactive website learning materials" with a value of (M=2.86, SD=1.134) and the item "no complete teaching aids" with a value of (M=2.72, SD =1.114). Other items recorded a mean score that was at an above average level. The learning issue that recorded the highest mean score was the item "limited time to study the topic during lectures", which is (M=3.72, SD=1.061). This is followed by the item "complex teaching information and notes" which recorded a value of (M=3.56, SD=1.025). Then followed by other themes that are at an above average level, namely "a lot of topic measurement" with the value of (M=3.45, SD=1.22), "traditional teaching (full explanation by the teacher) is not enough to understand the course content" with the values (M=3.40, SD=1.118), "high cost of

additional reference materials" with (M= 3.05, SD=1.119), "lack of electronic materials on the internet" with (M=3.04, SD=1.143) and "difficulty relating to lecturers and friends outside the lecture" with a values (M=3.03, SD=1.129).

Tendency to Use Innovation

The third question in this study is 'What is the tendency of students towards the use of innovation?'. Table 4 shows the mean score and standard deviation of respondents' feedback about the tendency to use innovation in learning courses.

Table 4. Tendency to Use Innovation

	D: Tendency to Use Innovation	Mean	SD	Interpretation
D1	I like learning that applies technology	4.26	.822	High
D2	I like interactive learning materials	4.35	.762	High
D3	I like picture notes in course learning	4.48	.690	High
D4	I like coloured notes in course learning	4.55	.696	High
D5	I like reading information that has interesting graphics	4.55	.667	High
D6	I like information that has interesting writing	4.56	.674	High
D7	I like the information based on the website	4.21	.834	High
	Average	**4.423**	**.735**	**High**

Based on table 4 above, the data shows that the tendency of students to use innovation in learning is at a high level with an overall mean score of 4.423 and a standard deviation of .735. These results show that students tend to use innovation in learning at a high level. All items recorded a mean score at a high level, preceded by the item "information that has interesting writing" with a value of (M=4.56, SD=.674), then followed by an item that recorded the same mean score, namely "information that has graphics interesting" with a value of (M=4.55, SD=.667) and the item "coloured notes in course learning" with a value of (M=4.55, SD=.696). Next followed by the item "photographic notes in course learning" with a value of (M=4.48, SP=.690), "interactive learning materials" with a value of (M=4.35, SD=.762), "learning that applies technology" with value (M=4.26, SD=.822) and the item "web-based information" with value (M=4.21, SD=.834).

Infographic Use Requirements

The final question in this study is 'What are the students' views on the need to use interactive infographics?'. Table 5 shows the mean score and standard deviation of the respondents' feedback about the need to use interactive infographics.

Table 5. Infographic Use Requirements

	E: Infographic Use Requirements	Mean	SD	Interpretation
E1	I believe interactive infographics make information easier to understand	4.61	.682	High
E2	I believe interactive infographics make information more interesting and concise	4.63	.640	High
E3	I believe interactive infographics can improve creative thinking	4.60	.668	High
E4	I believe interactive infographics strengthen understanding in learning	4.61	.689	High
E5	I believe interactive infographics help students remember concepts easily	4.63	.640	High
E6	I believe interactive infographics add focus in learning	4.60	.690	High

E7	I believe interactive infographics make learning faster	4.60	.705	High
E8	I believe interactive infographics motivate students to study harder	4.54	.703	High
E9	I believe interactive infographics make learning more fun	4.65	.652	High
E10	I believe learning through interactive infographics is more effective	4.59	.671	High
	Average	**4.606**	**.674**	**High**

Based on table 5 above, data interpretation shows that students' perception of the need to use interactive infographics in learning is at a high level with an overall mean score of 4.606 and a standard deviation of .674. This data shows that students believe that interactive infographics should be used as learning material at a high level. All items recorded a mean score at a high level. The item with the highest mean value is "interactive infographics make learning more fun" with a value of (M=4.65, SD=.652), followed by the item with the same mean score, which is "interactive infographics help students remember concepts easily" with a value of (M=4.63, SD=.690) and the item "interactive infographics make information more interesting and simpler" with a value of (M=4.63, SD=.640). Next, the items "interactive infographics make information easier to understand" with a value of (M=4.61, SD=.682), "interactive infographics strengthen understanding in learning" with a value of (M=4.61, SD=.689), "interactive infographics can increase thinking creativity" with a value of (M=4.60, SD=.668), "interactive infographics increase focus in learning" with a value of (M=4.60, SD=.690), "interactive infographics make learning faster" with a value of (M=4.60, SD=.705), "learning through interactive infographics is more effective" with a value of (M=4.59, SD=.671) and "interactive infographics motivate students to study more diligently" with a value of (M=4.54, SD=.703).

The overall results of the descriptive analysis indicate that an interactive infographic module based on the website is required. The results of every aspect examined which are at a high and above average level are able to demonstrate this. The data for the overall use of learning materials recorded a high level. Students most often use lecture notes as their primary source of learning materials. In reality, students only use the notes that the lecturers supply them to cover learning measures. This contributes to how frequently students use the content because it is concentrated and straightforward to obtain. Together with the usage of interactive websites and graphic note summaries, the utilisation of internet resources also produced the highest mean score. In keeping with the necessities of the modern world and the progress of technology, information is readily available online. By using devices like computers and mobile phones to access the internet, students may swiftly discover information. Students now also prefer to read information through graphic notes because it is able to facilitate understanding and interest them. Notes or learning that contain information and graphics can attract students' interest with the advantages found in it (Dewi et al., 2021). The use of interactive websites is also frequently used by students, but for learning Arabic grammar, the available websites do not focus on infographic features that include simple information and interesting graphics. The use of library materials is less used by students because a lot of reference information can now be accessed online. The tendency of students to use technology leads to the need to develop a special module based on interactive

infographics as a new alternative to make learning Arabic grammar more interesting and easier.

The results of the problems that students encountered with the learning approach also made this module necessary to build. According to the data, the majority of students agree that there is not sufficient time for study during lectures. Students only have three hours each week to study the Ibn 'Aqil Syntax Text Study Course. The issue prevents the learning measures from being fully learned. For self-study, students require an extra module to aid them with this problem. Furthermore, according to students' opinions, information-related and difficult teaching note issues also had the highest mean scores. Ibn Aqil's Syntax Text Study course textbook is written as a lengthy description and doesn't concentrate on the main content. This is coupled with the problem of large-scale learning. Teacher-centred teaching is also an issue for students to understand the content of the course because the method becomes a factor for students to easily feel bored or lose interest. Ahmid et al. (2018) stated that teacher-centred teaching through traditional delivery such as the translation method only causes students to be passive and lack motivation to learn. In addition, issues involving the high cost of additional reference materials, lack of electronic materials on the internet, difficulty in connecting with lecturers and friends outside of lectures, no interactive website learning materials and no complete teaching aids are also factors. to the production of an innovative, simple, easily accessible and interesting learning support material.

The findings related to the tendency to use innovation show that students are more inclined to learning content that applies innovation and technology. The content of Arabic grammar learning textbooks is presented in the form of long descriptions without focusing on interesting visual elements. Because today's generation is more impacted by technology and the digital world, this leads to students becoming bored easily. Compared to traditional techniques, technological innovation encourages students to study and learn autonomously, claim Ismail et al. (2021). Their inclination towards new features in learning content is considerable, as seen by their interest in information that applies the selection of writing, graphics, picture notes, interactive information, technology applications, and accessible through websites. The interactive infographic module that will be created has all of these elements.

The need to use the interactive infographic module that will be developed based on the students' views can be seen with the data results that show a high interpretation of all items. The advantages found in interactive infographics encourage students to consider that this module is a necessity to develop. Interactive infographics make learning more interesting and fun. Based on the study of Ahmed Ismaeel and Al Mulhim (2021), interactive infographics are able to attract the interest and focus of students and make learning fun. In addition, interactive infographics can make information more interesting and concise and help students remember the information or concept of a topic easily. They easily remember learning information with infographic-assisted methods compared to traditional methods (Wulandri et al., 2019). Interesting and simple information can also strengthen understanding in learning. In addition, learning information is also easier to understand and makes learning faster. Based on the findings and discussion above, a module will be developed according to the characteristics of interactive infographics that use the medium of websites. This module will combine static infographics and animated infographics presented interactively on the website. Learning information is organised centrally to make it easier for students to find and understand it.

CONCLUSION

In conclusion, the findings of each aspect presented become a factor in the need to develop an interactive infographic module based on a website in learning Arabic grammar. The module to be developed combines infographic elements interactively through a special website. The learning content combines the topics found in Ibn Aqil's Syntax Text Study Course. Information is presented interactively by providing systematic search buttons based on learning metrics. Discussion and training activities will also be provided to meet the elements of a learning module. This interactive infographic website will make it easier for students to find information in a simple, graphic, interactive and easily accessible way.

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REFERENCES

Abdul Hamid, M. F, Osman, N., Ab. Halim, Z., Yahaya, M. F., Nasir, M. S., Sha'ari, S. H., & Rahman, N. E. (2020). Need analysis for infographic application in arabic grammatical learning. *Universal Journal of Educational Research, 8*(3), 936-941.

Abdul Karim, Z. H, Zainal, H., & Zailani, S. (2020). Kajian literatur mafʻul mutlaq. *BITARA International Journal of Civilizational Studies and Human Sciences, 3*(1), 97-106.

Afify, M. K. (2018). The effect of the difference between infographic designing types (Static vs animated) on developing visual learning designing skills and recognition of its elements and principles. *International Journal of Emerging Technologies in Learning (iJET), 13*(9), 204-223.

Ahmed Ismaeel, D., & Al Mulhim, E. N. (2021). The influence of interactive and static infographics on the academic achievement of reflective and impulsive students. *Australasian Journal of Educational Technology, 37*(1), 147-162.

Ahmid, M. H., Abdullah, M. K., & Johari, K. (2018). Pengajaran guru dan kepercayaan motivasi pelajar dalam pembelajaran bahasa Arab di sekolah menengah. *Malaysian Journal of Social Sciences and Humanities (MJ - SSH), 3*(3), 136-147.

Ali, S. N., Khalid Khan, N. L., & Abdul Ghani, A. T. W. (2018). *Abad 21: Trend pembelajaran dan pengajaran politeknik & kolej komuniti Malaysia.* Bahagian Instruksional dan Pembelajaran Digital, Jabatan Pendidikan Politeknik dan Kolej Komuniti, Kementerian Pendidikan Malaysia.

Cleveland, W. S. (1985). *The elements of graphing data*. Wadsworth Advanced Books and Software Monterey.

Dewi, A. C., Adi, E. P., & Abidin, Z. (2021). Pengembangan infografis melalui Instagram sebagai penguatan pemahaman pokok bahasan sistem pencernaan manusia. *JKTP: Jurnal Kajian Teknologi Pendidikan, 4*(2), 216-224.

Dur, B. İ. U. (2014). Data visualisation and infographics in the visual communication design education at the age of information. *Journal of Arts and Humanities, 3*(5), 39-40.

Hamad, F. (2018). Infographic and its usage in education: A survey. *Text Technology: The Journal of Computer Text Processing, 14*(12), 78-85.

Husin, N., Norul'Azmi, N. A., & Daud, M. M. (2017). Pembelajaran kolaboratif melalui aplikasi telefon pintar dalam pembelajaran nahu. *E-Jurnal Penyelidikan Dan Inovasi*, *4*(1), 43-63.

Ismail, S., Saad, R., Radzi, N. A. A., Idris, N. A., & Aziz, N. E. M. (2021). Tahap penggunaan inovasi teknologi maklumat dan komunikasi (ICT) dalam pengajaran dan pembelajaran (PDP) pensyarah Kolej Universiti Islam Melaka. *Jurnal'Ulwan, 6*(2), 173-194.

Ismail, U. S., Atoh, N., Azrae, M., & Pisal, N. A. (2018). Urutan pemerolehan al- damir al-munfasil dalam ayat nominatif bahasa Arab dalam kalangan pelajar UiTM Perlis. *Asian People Journal (APJ), 1*(1), 66-81.

Jaffar, M. N., & Sha'ari, A. (2016). Penggunaan laman web i-MAJRURAT sebagai alat bantu mengajar tatabahasa Arab. *Al-Qanatir International Journal of Islamic Studies, 3*(1), 1-8.

Jamaluddin, N. H., & Baharudin, H. (2021). Tahap penggunaan strategi pembelajaran nahu dan penguasaan kata kerja Arab dalam kalangan pelajar pengajian arab di institusi pengajian tinggi Malaysia. International *Journal of Advanced Research in Islamic Studies and Education (ARISE), 1*(2), 86-97.

McKillip, J. (1987). *Need analysis: Tools for human services*. SAGE Publications.

Mohd Jamil, M. R., & Mat Noh, N. (2020). *Kepelbagaian metodologi dalam penyelidikan reka bentuk dan pembangunan.* Qaisar Prestige Resources.

Mohd Noh, M. A., Mohd Fauzi, M. S. H., Jing, H. F., & 1lias, M. F. (2017). Infographics: Teaching and learning tool. *Attarbawiy: Malaysian Online Journal of Education, 1*(1), 58-63.

Murray, I. R., Murray, A. D., Wordie, S. J., Oliver, C. W., Murray, A. W. & Simpson, A. H. R. W. (2017). Maximising the impact of your work using infographics. *Bone and Joint Research, 6*(11), 619-620.

Nunnally, J. C. & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.

Richey, R. C. & Klein, J. D. (2007). *Design and development research: Methods, strategies and issues.* Lauwrence Erlbaum Associates Publishers.

Sallehin, S. A., & Ab Halim, F. (2018). Penggunaan alat bahan bantu mengajar berasaskan multimedia dalam pengajaran dan pembelajaran di Sekolah Menengah Zon Benut. *Online Journal for TVET Practitioners, 3*(1), 1-7.

Siraj, S., Abdullah, M. R. T. L., & Muhamad Rozkee, R. (2020). *Pendekatan penyelidikan rekabentuk dan pembangunan*. Penerbit UPSI.

Sjahrony, A., Lubis, M. A., Baharudin, H., & Kamis, M. S. (2017). Kepentingan pembelajaran motivasi bahasa Arab dalam kalangan pelajar IPTA dari perspektif sorotan kajian. *ASEAN Comparative Education Research Journal on Islam and Civilization (ACER-J)*, *1*(2), 102-112.

Smiciklas, M. (2012). *The power of infographics: Using pictures to communicate and connect with your audiences*. Que Publishing.

Sudarman, S., Sugeng, S., & Hairullah, H. (2019). Development of interactive infographic learning multimedia on study methodology study course of

Economic Education Program of Mulawarman University. *JPP (Jurnal Pendidikan dan Pembelajaran), 25*(2), 51-64.

Syed Ab Hamid, S. M. A., Mohamad, A. H., Kamis, M. S., Lubis, M. A., & Arriffen, A. M. (2017). Kelemahan pelajar-pelajar Sekolah Menengah Kebangsaan Agama (SMKA) dan Sekolah Agama Menengah (SAM) dalam penguasaan topik terpilih dalam tatabahasa Arab. *ASEAN Comparative Education Research Journal on Islam and Civilization (ACER-J)*, *1*(2), 67-78.

Witkin, B. R. & Altschuld, J. W. (1995). *Planning and conducting needs assessments: A practical guide.* SAGE Publishing.

Wulandari, V., Abidin, Z., & Praherdhiono, H. (2019). Pengembangan media pembelajaran e-book infografis sebagai penguatan kognitif siswa X MIA. *JKTP: Jurnal Kajian Teknologi Pendidikan, 2*(1), 37-44.

Zaini, A. R., Zakaria, N., Hamdan, H., Ghazali, M. R., & Ismail, M. R. (2019). Pengajaran bahasa Arab di Malaysia: Permasalahan dan cabaran. *Jurnal Pengajian Islam*, *12*(1), 47-57.