Development of Hots-Based E-Worksheets for Arabic Grammar Course in Department of Arabic Language Education

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Abstract: The purpose of this research is to produce a valid and practical Arabic grammar e-worksheet for university students based on Higher Order Thinking Skills (HOTS). The research type is Research & Development (R&D) with the Instructional Development Institute (IDI) model. Research data were collected through questionnaires and documentation. The data obtained from the validity and practicality questionnaires were tabulated for each component of the assessment and then the average score was calculated and converted into qualitative data. Documentation technique is done by analyzing documents in the form of syllabus, materials, and literatures. The results of this research and development show that the developed Arabic grammar e-worksheet is stated to be very valid with an average validity score of 4.35 and very practical with an average practicality score of 4.8. Based on the results, it is hoped that the lecturers will be able to use the developed e-worksheet in the Arabic grammar course, because it can facilitate students' higher-level thinking skills.

Abstrak: Tujuan penelitian ini adalah untuk menghasilkan Lembar Kerja Mahasiswa Elektronik (e-LKM) mata kuliah Nahw berbasis Higher Order Thinking Skills (HOTS) yang valid dan praktis. Jenis penelitian ini adalah Research & Development (R&D) dengan model Instructional Development Institute (IDI). Data penelitian dikumpulkan melalui angket dan dokumentasi. Data yang diperoleh dari angket validitas dan angket praktikalitas ditabulasi untuk setiap komponen penilaian kemudian dihitung skor rata-rata dan dikonversikan menjadi data kualitatif. Adapun teknik dokumentasi dilakukan dengan menganalisis dokumen-dokumen berupa silabus, materi ajar, dan literatur. Hasil penelitian dan pengembangan ini menunjukkan bahwa e-LKM nahw berbasis HOTS hasil pengembangan dinyatakan sangat valid dengan skor rata-rata uji validitas 4,35 dan sangat praktis dengan skor rata-rata uji praktikalitas 4,8. Berdasarkan hasil penelitian ini, maka diharapkan kepada dosen agar dapat menggunakan e-LKM hasil pengembangan dalam mata kuliah Nahw, karena dapat memfasilitasi kemampuan berpikir tingkat tinggi mahasiswa.

INTRODUCTION

The Covid-19 pandemic, which has spread in Indonesia for more than two years, has changed various structures of people's lives, including education. During the pandemic, education was carried out online, from elementary education, secondary education, to higher education. Currently, even though Indonesia is in the new-normal era, the education sector has not fully returned to normal. In universities, online learning is still enforced. Only some students are required to take part in offline learning. This condition certainly requires lecturers to adapt learning through the use of available learning technology.

Teaching materials in the form of electronic student worksheets (Lembar Kerja Mahasiswa Elektronik, "E-LKM") are one of the breakthroughs in learning technology that can help realize more effective online learning. E-LKM is an LKM in electronic form which can also be accessed easily via Android so that it can be used by students to assist the learning process. E-LKM can replace worksheets that are usually given by lecturers during face-to-face learning. In online learning, the existence of E-LKM is very much needed because of the limitations of lecturers in providing exercises in online classrooms.

Teaching materials are one of the factors that influence the success of learning (Majid, 2012, Nurlaila et al., 2022). Teaching materials are materials that contain learning messages and can be utilized in the learning process as learning resources (Mulyasa, 2002). Student Worksheets (Lembar Kerja Mahasiswa, "LKM") are a form of teaching materials used for university students. According to Trianto (2010), worksheets can assist in the learning process as a guide for students to carry out investigative or problem-solving activities. Worksheets can also be used as teaching materials in self-study by students, either in class or at home.

E-LKM is included in electronic teaching materials. Risdianto (2017) argues that electronic teaching materials are teaching materials that are packaged in electronic form in the form of audio, audio-visual, or interactive multimedia. Teaching materials included in this category are e-books, e-magazines, interactive multimedia CDs/DVDs, flash models or interactive slides, e-learning, and so on.

Teaching materials that were originally only available in printed form, have now been developed into electronic form, including the E-LKM. According to Pasandaran, Kartika, & Masni (2018), the use of LKM has several advantages, namely activating students, assisting students in developing concepts, training students to find and develop teaching and learning processes, and assisting lecturers and students in the learning process. Furthermore, it is also explained that LKM can build students' abilities in independent learning, reasoning, investigation, and problem solving.

F-LKM must be designed according to the levels of thinking that students must have, namely Higher Order Thinking Skills (HOTS). Brookhart (2010) has classified the definition of HOTS into three categories, namely (1) which defines HOTS as transfer means not only remembering but also understanding and being able to use what has been learned, (2) which defines HOTS as thinking critical, and (3) which defines HOTS as problem solving. Rofiah, Aminah, & Sunarno (2018) argue that HOTS is a thinking process that does not just memorize and relay known information. Higher-order thinking skills are the ability to connect, manipulate, and transform existing knowledge and experience to think critically and creatively in an effort to make decisions and solve problems in new situations.

G-In learning Arabic grammar (*Nahw*), higher order thinking skills (HOTS) are also very necessary. Al-Amarneh (2015) explains that critical thinking skills are needed in

learning *Nahw*, because with critical thinking skills a learner will be able to learn the conceptual structure of *'ilm al-nahw*, be able to develop certain thinking methods in understanding the basic rules and principles related with the grammatical structure of the language, as well as making students better able to reflect on the *Nahw* rules and their *dalalah tarkib*. Therefore, Al-Amarneh also explained that critical thinking skills are one of the objectives of learning *Nahw*.

E-LKM for Arabic grammar course (*Nahw* course) designed based on Higher Order Thinking Skills (HOTS) is one of the solutions to improve *Nahw* achievements while at the same time increasing students' thinking skills. The unavailability of LKM designed on the basis of HOTS for the *Nahw* course, especially in electronic form, makes the development of E-LKM urgently needed.

The developmental research related to *Nahw* learning for university students that has been carried out can be classified into two groups. First, the development research group on *Nahw* teaching materials (Fauzan et al., 2019; Nashoih & Darmawan, 2019). Second, the development research group on *Nahw* learning media (Asrori & Triyono, 2020; Bahruddin, 2019; Barnabas et al., 2020; Kurniawan et al., 2019; Sulhadi, 2020). Based on the literature review, only two development research groups were found related to *Nahw* learning for university students, namely the development of teaching materials and the development of learning media.

As for research and development on LKM for learning *Nahw* has not yet been found. Meanwhile, research and development on LKM in other disciplines has been widely developed (Aldresti et al., 2021; Krisnawati & Fitriani, 2020; Ramadhona & Izzati, 2018; Wirda et al., 2018). In *Nahw* learning, there has not been any development research on LKM, both in the form of printed LKM and in the form of electronic LKM.

Research on HOTS in learning Arabic that has been carried out covers several aspects, including those related to Arabic language assessment (Ainin, 2017; Fauziah et al., 2020; Rodiana & Pahlevi, 2020), development of designs and tools for learning Arabic (Faruq & Huda, 2020; Widodo et al., 2021), Arabic skills learning (Ilmiani & Delima, 2021), and analysis of obstacles to the application of HOTS in learning Arabic (Ritonga et al., 2021). Meanwhile, research and development on HOTS-based LKM has not yet been found, especially regarding LKM in electronic form. Therefore, research and development of the e-LKM needs to be carried out.

F-LKM that can be accessed via Android will make it easier for university students compared to those that require using a computer. The Eclipse application is an application that can be used to create attractive electronic worksheets that produce output that is not only accessible via computer but can also be accessed via Android. Supegina (2018) argues that Eclipse is one of the most widely used applications because it is free and open source. In addition, Eclipse can also be developed by users through plug-in components.

Eclipse is an open source community that can produce an open programming platform (Supardi, 2014). Eclipse is an IDE (Integrated Development Environment) that is used to develop software and can be run on all platforms so that it is called independent platform (Dewi et al., 2018). Eclipse has many advantages so it is widely used in software development. Among its advantages are multi-platform, multi-language, and multi-role (Dewi et al., 2018; Saefudin & Syamsudin, 2016).

Thus, based on several related studies that have been conducted by previous researchers, no research has been found on the development of E-LKM based on Higher Order Thinking Skills (HOTS). Likewise, the use of the Eclipse application has not been

used either for the development of the *Nahw* teaching materials. Therefore, research and development of HOTS-based E-LKM using the Eclipse application is carried out to fill in the gaps and to meet the demand for these E-LKM in the *Nahw* course.

METHODS

The type of research is R&D (Research & Development). The development model used is the IDI (Instructional Development Institute) model. The development of E-LKM using the IDI (Instructional Development Institute) model applies the principles of a systems approach with three stages, namely define, develop, and evaluate. These three stages are connected with feedback to make revisions.

To collect data related to the developed E-LKM, researchers used questionnaires and documentation. Questionnaires are used to obtain data regarding the validity and practicality of the developed E-LKM. The validity questionnaire was filled out by the validator regarding the content and construct of the developed e-LKM, while the practicality questionnaire was filled out by the lecturers of the *Nahw* course. Questionnaires are also used to obtain analysis data on the needs of lecturers and students for the developed E-LKM. Documentation technique is done by analyzing documents in the form of syllabus, materials, and literatures needed to collect data and materials for producing E-LKM.

The data obtained from the validity and practicality questionnaire were tabulated for each component and sub-component of the existing items, then the average score for each component was calculated. The average score is converted into qualitative data using the following scale:

Table 1. Assessment Scale

Average Score	Category
4 01-5, 00	Very Valid/Very Practical
3, 01-4, 00	Valid/Practical
2, 01-3, 00	Quite Valid/ Quite Practical
1, 01-2, 00	Less Valid/Less Practical

0-1, 00	Not valid/Not Practical

RESULTS AND DISCUSSION

This research and development began with analyzing the needs of lecturers and students for *Nahw* learning materials in the form of E-LKM (electronic student worksheets). Data was collected through a questionnaire filled out by 8 lecturers and 84 students of Arabic Language Education Department from 3 State Islamic Universities in West Sumatra Province, Indonesia, namely UIN Mahmud Yunus Batusangkar, UIN Imam Bonjol Padang, and UIN Sjech M. Djamil Djambek Bukittinggi. Through the questionnaire, an overview of *Nahw* learning so far was obtained and the opinions of lecturers and students regarding the development of HOTS-based E-LKM for *Nahw* course were also known. The results at this stage are as follows:

Table 2. Lecturers' Need Analysis

Statements	%				
	SA	A	N	D	SD
LKM as one of the teaching materials for lecturers in teaching *Nahw*	37.5	50	12.5	0	0
Development of E-LKM for *Nahw* course for the students	75	25	0	0	0
The use of E-LKM is effective	50	37,5	12,5	0	0
E-LKM can increase learning interest in *Nahw* of the students	37,5	50	12,5	0	0
E-LKM can improve the *Nahw* learning achievements of the students	37,5	50	12,5	0	0
E-LKM for *Nahw* course is prepared based on Higher Order Thinking Skills (HOTS)	62,5	37,5	0	0	0
Students need to master Higher Order Thinking Skills (HOTS)	50	50	0	0	0
E-LKM for *Nahw* course which is based on Higher Order Thinking Skills (HOTS) is suitable for the students of Arabic Language Education Department	75	25	0	0	0

Table 3. Students' Need Analysis

Statements	%				
	SA	A	N	D	SD

As a student of Arabic Language Education Department, the *Nahw* course is important to me	100	0	0	0	0
LKM as one of the *Nahw* learning materials	34	59	7	0	0
Development of LKM for learning *Nahw* is needed	34	60	6	0	0
LKM need to be made in electronic form (e-LKM)	21	66	9	4	0
e-LKM is easy to be used	12	49	35	4	0
The use of e-LKM is effective	10	64	26	0	0
e-LKM can increase *Nahw* learning interest of the students	16	73	11	0	0
e-LKM can improve the *Nahw* learning achievements of the students	17	68	15	0	0

Based on the needs analysis data that has been obtained from lecturers, it can be concluded that HOTS-based E-LKM is very much needed in *Nahw* learning for the students of Arabic Language Education Department. Meanwhile, students stated that they agreed to develop a HOTS-based E-LKM for *Nahw* course so that students' interest, learning motivation, and learning outcomes would increase. Based on the needs analysis then researchers proceed to the design stage.

The design stage is the stage of designing the E-LKM for *Nahw* course. At this stage, the researchers designed the E-LKM on the material *Al-Fa'il wa Na'ibul Fa'il, Al-Mubtada' wal Khabr, Ism Kaana wa Akhawatuha, Khabr Inna wa Akhawatuha, Maf'ul Bih, Maf'ul Muthlaq, Azh-Zharf (Maf'ul Fih), Al-Hal wa At-Tamyiz wa Al-Mustatsna, Al-Majrur bi Hurufil Jarr wal Majruur bil Idhafah,* and *At-Tawaabi'.*

The researches started the design stage by designing the E-LKM. The E-LKM design consists of an intro page, main menu page, introductory page, profile page, materials page, and exercises page. The researchers also designed the materials and questions. The materials were taken from various sources and presented in simple language so that students can easily understand them. The questions are designed according to the expected higher order thinking skills (HOTS-based). The HOTS levels used in the questions are C4 (analyzing), C5 (evaluating), and C6 (creating). The design of questions consists of three types, namely multiple choice, true-false, and fill in the blanks.

Based on the design of the E-LKM above, the researchers proceed to the development stage. The development stage aims to produce HOTS-based E-LKM for *Nahw* course for the students of Arabic Language Education Departement. The results at this development stage are in the form of a prototype of HOTS-based E-LKM for *Nahw* course as shown in the following figures:

Figure 1. Prototype of E-LKM

The prototype of E-LKM for *Nahw* course that has been produced is validated on the material aspect and design aspect. The validators consist of 4 experts. The results of the validity test on the material aspect are as follows:

Table 4. Materials Validity Test Results

Aspect	V1	V2	V3	V4	Average	Category
1	5	2	5	4	4	Valid
2	5	2	5	4	4	Valid
3	5	4	4	4	4.25	Very Valid
4	5	4	5	4	4.5	Very Valid
5	5	4	5	4	4.5	Very Valid
6	5	5	5	5	5	Very Valid
7	5	4	5	4	4.5	Very Valid
8	5	5	5	4	4.75	Very Valid
9	5	3	4	4	4	Valid
10	5	4	4	4	4.25	Very Valid
11	5	4	4	4	4.25	Very Valid
12	5	3	4	4	4	Valid
Average	5	3.7	4.6	4.1	4.33	Very Valid

The validators have assessed the validity of the E-LKM on the material aspect. The material validation questionnaire consists of 12 items. Average scores of all items are in the valid category (4 items) and very valid category (8 items). The HOTS-based E-LKM got an average score of 4.33 in material aspect. Thus, HOTS-based E-LKM for *Nahw* course is very valid on the material aspects.

The results of the validity test on the design aspect are as follows:

Table 5. Design Validity Test Results

Aspect	V1	V2	V3	V4	Average	Category
1	5	4	5	4	4.5	Very Valid
2	5	4	5	4	4.5	Very Valid
3	5	4	5	4	4.5	Very Valid
4	5	4	5	4	4.5	Very Valid
5	5	3	5	4	4.25	Very Valid
6	5	3	5	4	4.25	Very Valid
7	5	4	5	4	4.5	Very Valid
8	5	4	5	4	4.5	Very Valid
9	5	4	5	4	4.5	Very Valid
10	5	3	5	4	4.25	Very Valid
11	5	3	4	4	4	Valid

12	5	3	5	4	4.25	Very Valid
Average	5	3.6	4.9	4	4.375	Very Valid

The validators have also assessed the validity of the E-LKM on design aspect. The design validation questionnaire consists of 12 items. Average scores of all items are in the valid category (1 item) and very valid category (11 items). The HOTS-based E-LKM got an average score of 4.375 in design aspect. Thus, HOTS-based E-LKM for *Nahw* course is very valid on the design aspects.

Based on the validation results of each aspect of the HOTS-based E-LKM for *Nahw* course, it is known that the average of material and design validation score is 4.35 (which is in the range of 4.01 – 5.00). It means that the HOTS-based e-LKM is in the very valid category.

In addition to providing a quantitative assessment, the validators also provide suggestions for improving the material aspects and design aspects of the developed E-LKM. The suggestions on the material aspect are as follows.
1) E-LKM has not attached Learning Objectives.
2) There are several writings that cannot be read clearly, such as the alif and lam in the sentence "al-mubtada" seem to blend together.
3) The questions are tested for validity and reliability.

The suggestions on the design aspect are as follows.
1) The button sound should be fixed.
2) The materials should be accompanied by an explanation.
3) The materials should be presented with a more attractive design appearance, for example using certain colors and symbols.

The developed HOTS-based E-LKM for *Nahw* course was also tested for practicality. The practicality test was carried out by five lecturers. The results of the practicality test are as follows:

Tabel 6. Practicality Test Results

Aspect	L1	L2	L3	L4	L5	Average	Category
1	4	5	5	5	5	4.8	Very Practical
2	4	5	5	4	5	4.6	Very Practical
3	5	5	5	4	5	4.8	Very Practical
4	5	5	5	5	5	5	Very Practical
5	4	5	5	5	5	4.8	Very Practical
6	4	5	5	5	5	4.8	Very Practical
7	5	5	4	5	5	4.8	Very Practical
8	5	5	4	4	5	4.6	Very Practical
9	5	5	5	5	5	5	Very Practical
10	5	4	5	5	5	4.8	Very Practical
11	4	5	5	5	5	4.8	Very Practical
12	4	5	5	5	5	4.8	Very Practical
Average	4.5	4.92	4.83	4.75		4.8	Very Practical

Based on the table above, it can be understood that the average practicality score is 4.8 (which is in the range of 4.01 – 5.00). It means that the HOTS-based E-LKM is in the very practical category.

In addition to providing quantitative responses, lecturers also provide suggestions for improving the developed E-LKM products. The suggestions given are as follows.
1) Explanation of the material is made more interesting.
2) Added a "back" or "home" menu on each material page.
3) The exercises are done on the e-LKM page (not on the web page).
4) *Maf'ul liajlih* and *Maf'ul ma'ah* materials are added to the *Manshubat* part.

The HOTS-based E-LKM for *Nahw* course was revised based on the suggestions provided. The first stage of revision was carried out based on validators' suggestions. The E-LKM revision was carried out in several parts. E-LKM revisions on material aspects are carried out in the main menu section. Before the revision, there was no "Learning Objectives" menu. After the revision, a "Learning Objectives" menu was

included which, when clicked, would go to the page containing the learning objectives.

Revision of E-LKM in the design aspect is also carried out. Before the revision, the explanation of the material was still presented in the form of book text only, so after the revision an explanation of the material was presented accompanied by the next and back buttons. Before the revision there were no attractive colors and images in the material, and after the revision attractive images and colors were added to the material.

The next stage of product revision is carried out based on suggestions obtained from practicality tests. The revisions made at this stage are the addition of a back/home menu on each material page. Before the revision, there was no home button on the contents of the material page, so after the revision there was a home button in the material.

This research and development resulted in a HOTS-based E-LKM for *Nahw* course that can improve students' *Nahw* abilities as well as stimulate their higher order thinking skills (HOTS). This is in line with the opinion expressed by Al-Amarneh (2015), that one of the objectives of learning *Nahw* is to train critical thinking skills.

In learning for university students, the use of E-LKM is also very widespread. Various bases are also used in the development of E-LKM, such as constructivist, collaborative learning, contextual teaching, problem-based learning, and also HOTS-based learning. This shows that E-LKM is relevant for learning for university students.

CONCLUSION

Based on the results of the research and development above, the following conclusions can be drawn:

1) Based on the needs analysis data that has been obtained from lecturers, it can be concluded that HOTS-based E-LKM is very much needed in *Nahw* learning for the students of Arabic Language Education Department. Meanwhile, students stated that they agreed to develop a HOTS-based E-LKM so that learning interest, learning motivation, and learning achievement would increase.

2) The developed E-LKM design consists of an intro page, main menu page, introductory page, profile page, materials page, and exercises page. The exercises consist of three types of questions, namely multiple choice, true-false, and filling in the blanks. The HOTS levels used in the questions are C4 (analysis), C5 (evaluation), and C6 (creating).

3) The average score of validation is 4.352. This shows that the HOTS-based E-LKM for *Nahw* course is stated to be very valid.

4) The average practicality score is 4.8. It means that the HOTS-based E-LKM is in the very practical category.

Based on the results of the research and development above, it is hoped that the lecturers will be able to use the developed E-LKM for *Nahw* course, because it can facilitate students' higher-level thinking skills. Furthermore, researchers are expected to be able to research and develop further in order to improve the limitations of the developed E-LKM.

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