# TELEVOCABOT: AN INTERACTIVE VOCABULARY LEARNING SOURCE FOR COLLEGE STUDENT OF ENGLISH LANGUAGE EDUCATION DEPARTMENT

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**Abstrak:** Tujuan dari penelitian ini adalah untuk mengembangkan Televocabot (Telegram Vocabulary Bot) sebagai sumber pembelajaran interaktif mata kuliah Vocabulary. Desain penelitian yang digunakan adalah penelitian dan pengembangan (R&D). Sebagai salah satu desain penelitian yang bertujuan untuk mengembangkan produk-produk pendidikan, seperti kurikulum, silabus, buku teks, media pembelajaran, dan lain-lain. Subyek dari penelitian ini adalah mahasiwa semester dua, Pendidikan Bahasa Inggris di STKIP PGRI Trenggalek tahun akademik 2018/2019 yang terdiri dari 27 mahasiswa; 19 mahasiswa perempuan dan 8 laki laki. Instrument yang digunakan dalam penelitian ini adalah kuesioner, wawancara, dan observasi. Data yang dikumpulkan dengan kuesioner dianalisis secara kuantitatif, dan data yang dikumpulkan dengan observasi dan wawancara dianalisis secara kualitatif. Produk telah dikembangkan berdasarkan kebutuhan mahasiswa, teori (R & D), teori kosakata, teori e-learning, teori telegram dan teori penggunaan telegram bot. produk telah dikembangkan melalui lima tahap pengembangan. Hasil skor dari analisa kebutuhan adalah 2688. Ini berarti, responden setuju bahwa mata kuliah kosakata perlu adanya media pembelajaran berbasis e-learning. Kemudian, hasil skor dari uji coba produk adalah 2768. Ini berarti, responden setuju bahwa produk dari penelitian telah sangat baik dan layak digunakan dalam pembelajaran mata kuliah kosakata.

**Kata Kunci** : E-learning, Vocabulary, Telegram bot.

**Abstract:** The objective of the research is to develop Televocabot (Telegram Vocabulary Bot) as an interactive vocabulary learning source. The research design is educational R & D as one research design aimed at developing educational products, like curriculum, syllabus, textbooks, instructional media, etc. The subject of this research is the second semester of English language education department students 2018/2019 academic year consists of 27 students; 19 students of female and eight students of male. The instruments used in this research are a questionnaire, interview, and observation. The data collected by the questionnaire is analyzed quantitative way, and data collected by observation and interview are analyzed qualitative way. The product is developed based on students' needs, studying the theory of R&D, studying the theory of vocabulary, Telegram, E-learning, and studying the theory of the usage of telegram bot. The product is developed in five steps development. The result of the need analysis score is 2688. It means the respondent agrees that the vocabulary course needs to be a learning media. Then, the result of the field-test score is 2768. It means the respondent agrees that the product of this research was excellent and feasible to use as media in learning vocabulary.

**Key Words:** E-learning, Vocabulary, Telegram bot.

## INTRODUCTION

Nowadays, with the advancement of ICT, "E-learning has emerged from traditional learning" (Basuki and Hidayati, 2019) that E-learning refers to the use of information and communication technologies to enable access to online learning/teaching resources (Pande et al. 2016:275). Further, E-learning is a learning system used for the medium teaching process without having to meet face to face directly between the teacher and students (Ardiansyah in Cucus and Aprilinda 2016:1). Furthermore, E-learning is the use of information and computer technologies to create learning experiences (Horton W, 2006:1). Therefore, E-learning is the use of information and communication technologies to create a learning experience and to access online learning/teaching resources without having meet face to face directly between the teacher and students.

With computer and Internet technologies, it can create many different kinds of e-learning, each providing learners with a distinctive type of learning experience and each suited to different purposes and situations (Horton, 2006:361). Moreover, Horton W, (2006:2) stated that "there are seven varieties of e-learning." One of them, some varieties called mobile learning. Mobile learning is learning from the world while moving about in the world. It is aided by mobile devices such as PDAs and smartphones (Horton W, 2006:2). Thus, the combination of smartphone and internet technologies for teaching media can also be called to be e-learning.

Refer to the explanation above. Telegram is one of the smartphone application messaging that has the purpose of sending and receiving an instant message, multimedia messages and communicate in groups with other people (Saribekyan and Margvelashvii, 2017:3). Further, Olieviera et.al. in Jurnal Kejuruteraan Teknologi dan Sains Sosial, (2017:3) state that "There are many messengers application, but what sets it apart is the security feature through data encryption and the ability to create telegram bots with several functions via programming code using the Telegram bot API (Application Programming Interface). Accordingly, Telegram is not only social media messaging, but also it has the ability to create Telegram bots with several functions such as games, calculator, teaching media, etc.

Telegram bot is third-party applications that run inside Telegram. Users can interact with bots by sending them messages, commands, and inline requests. You control your bots using HTTPS requests to our bot API (https://core.telegram.org/bots accessed on December, 26th 2018). Furthermore, Bots are telegram account operated by programs that respond to message or mentions and can be integrated in another program. They mimic the behavior of a human being in specific applications, like a help desk (Zennaro et

al., 2016:298). Therefore, Telegram bot has an excellent opportunity to be developed into an interactive learning media.

Meanwhile, vocabulary is very important; it is the core of language complexities and as a starting point of those who are learning a new language (Basuki, 2017:17). Hence, vocabulary is the total number of words that are needed to communicate ideas and express the speakers meaning; that is the reason why it is essential to learn vocabulary (Alqahtani, 2015:25). Thus, Vocabulary is the total number of words as a starting point for those who are learning a new language to communicate ideas and express the speakers meaning. That is the reason why it is crucial.

At present, in STKIP PGRI Trenggalek, which already has a vocabulary course, there need to be a learning media. Based on the observations of the researchers, teaching vocabulary in STKIP PGRI Trenggalek is currently conventional or only uses textbooks. Therefore, it is indispensable for e learning-based to help the teaching process, which called Televocabot.

Considering the background descriptions above, the researcher is interested in developing Televocabot as an interactive vocabulary learning source for a college student of the English language program.

The product of this research is Televocabot. It is an interactive vocabulary learning source for college student of English language program. Televocabot is an acronym of 3 words, they are Telegram, Vocabulary, and Robot. Televocabot is kind of software that runs on the Telegram platform. The requirement to access Televoabot is very easy, just by downloading Telegram applications on smartphones (Android / iOS) and windows then search "@TelevocaBot" on Telegram search bar, afterwards press start button. Televocabot contains all learning material vocabulary 1 for college students. When the user sends message to Televocabot, it will answer your message. But, its limit on learning materials vocabulary 1. Therefore, Televocabot not only interesting for college student but also very helpful to get access learning material vocabulary 1 anytime and anywhere.

Meanwhile, this research is limited to develop Televocabot as interactive vocabulary learning source for English language program college students of STKIP PGRI Trenggalek especially on 2nd semester 2018/2019 academic year.

To discuss further, E-learning refers to the use of information and communication technologies to enable the access to online learning/teaching resources (Pande et.al 2016:275). Further, E-learning is learning system used for medium teaching process without having to meet face to face directly between the teacher and students

(Ardiansyah in Cucus and Aprilinda 2016:1). Furthermore, E-learning is the use of information and computer technologies to create learning experiences (Horton W, 2006:1). Therefore, E-learning is a the use of information and communication technologies to create learning experience and to access online learning / teaching resources without having meet face to face directly between the teacher and students.

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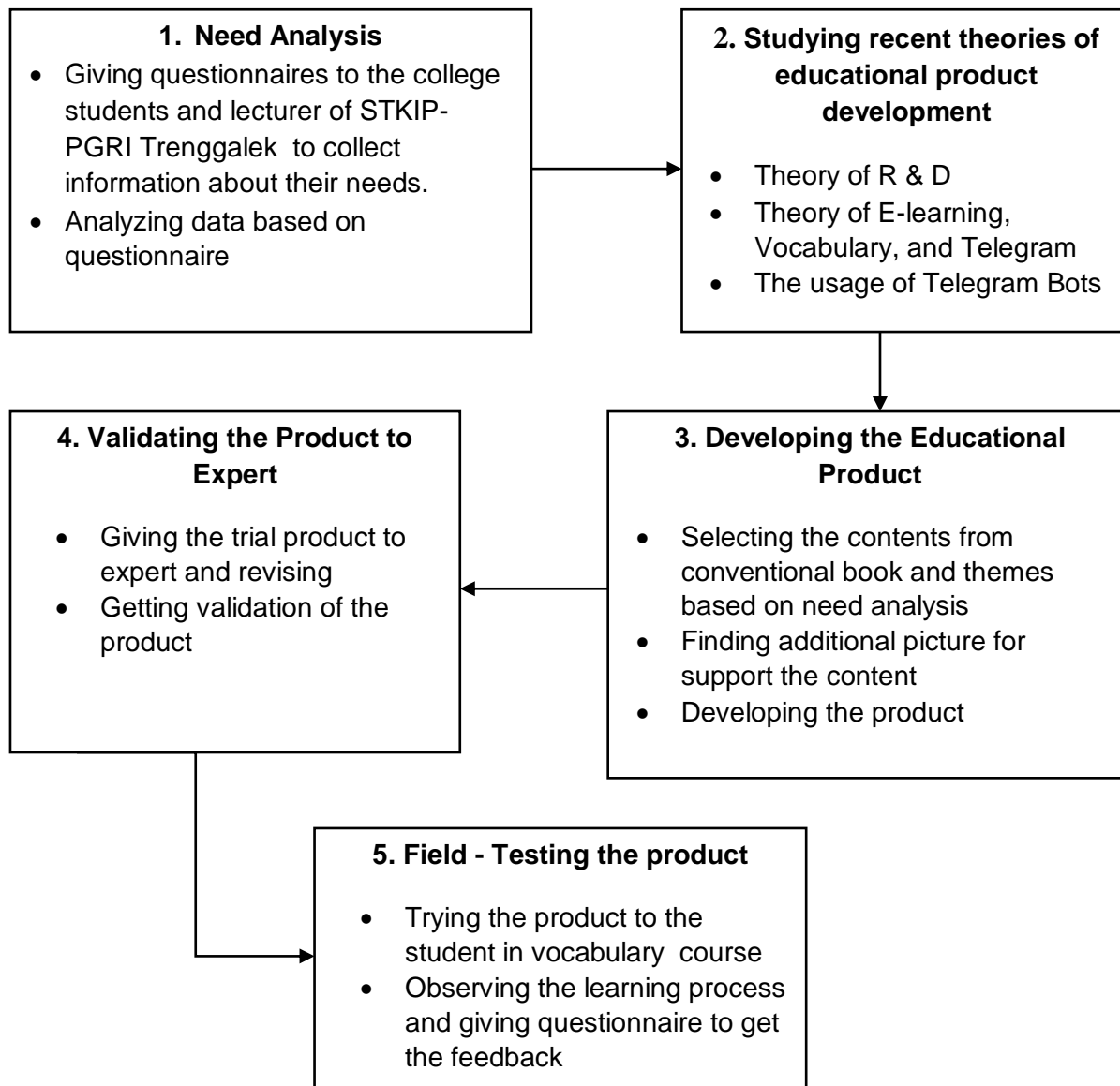
While, Televocabot is an interactive vocabulary learning source for college student of English language program. Televocabot is an acronym of 3 words, they are Telegram, Vocabulary, and Robot. Televocabot is kind of software that runs on the Telegram platform. The requirement to access Televoabot is very easy, just by downloading Telegram applications on smartphones (Android / iOS) and windows then search "@TelevocaBot" on Telegram search bar, afterwards press start button. Televocabot contains all learning material vocabulary 1 for college students. When the user sends message to Televocabot, it will answer your message. But, its limit on learning materials vocabulary 1. Therefore, Televocabot not only interesting for college student but also very helpful to get access learning material vocabulary 1 anytime and anywhere.

## RESEARCH METHOD

The research method used in this research is research and development (R&D). According to Gall et al.'s (2003) in Basuki (2017:21) they describe educational R&D as an industry-based development model whose findings are used to design new products and procedures, which then are systematically field-tested, evaluated, and refined until they meet specified criteria of effectiveness, quality, or similar standards. Additionally, the definition of R & D, according to Latief (2012:172) in Basuki (2017:21), defined "educational R & D as one research design aimed at developing educational products, like curriculum, syllabus, textbooks, instructional media, etc".

The research procedure in this research adapted from Latief in Basuki (2017:21) that there are five procedures. They need analysis, studying recent theories of education product development, developing the educational product, validating the product to expert, and field-testing the product.

Figure 1. **Research and Development Procedures**
(Adapted from Latief in Basuki (2017:21)

**1. Need Analysis**
- Giving questionnaires to the college students and lecturer of STKIP-PGRI Trenggalek to collect information about their needs.
- Analyzing data based on questionnaire

**2. Studying recent theories of educational product development**
- Theory of R & D
- Theory of E-learning, Vocabulary, and Telegram
- The usage of Telegram Bots

**4. Validating the Product to Expert**
- Giving the trial product to expert and revising
- Getting validation of the product

**3. Developing the Educational Product**
- Selecting the contents from conventional book and themes based on need analysis
- Finding additional picture for support the content
- Developing the product

**5. Field - Testing the product**
- Trying the product to the student in vocabulary course
- Observing the learning process and giving questionnaire to get the feedback

A population is all the individuals or units of interest; typically, there is not available data for almost all individuals in a population (Hanlon and Larget, 2011:7). Thus the population of this research is English language education department students of STKIP PGRI Trenggalek 2018/2019 academic year. It is consists of 72 students.

The sample is part of the population, and it is a representation of the population (Sugiyono 2015:118). In this research, the researcher uses a nonprobability sampling technique, namely, purposive sampling. Purposive sampling is the determining sample technique with specific consideration (Sugiyono (2015:124). Reasons for selecting samples using Purposive Sampling Techniques is because not all samples have criteria

according to the researcher specify. Accordingly, the researcher creates criteria that must be fulfilled by the sample of this research. The criteria are that a sample must have a vocabulary 1 lesson. Based on the criteria, the researcher determines the second semester of English language education department students of STKIP PGRI Trenggalek 2018/2019 academic year as a sample. The second semester of English language education department students 2018/2019 academic year consists of 27 students; 19 students of female and eight students of male.

The instruments used in this research are a questionnaire, interview, and observation.

The first instrument is a questionnaire. Here the researcher used a questionnaire twice. They need analysis and field-testing for the product. In need analysis researcher use questionnaire to know the students' needs in vocabulary one learning. Then, in-field testing the product researcher use questionnaire to know the feedback from students and lecturer.

Further, as stated (Ary, 2010:397), "Keep the questionnaire as brief as possible so that it requires a minimum the respondents' time." This questionnaire uses a "strongly disagree, disagree, neutral, agree, and strongly agree" question scale. It consists of some questions to know students' and lecturer of vocabulary course opinions about their needs and their response after using this product.

The second instrument is Interview, Interview is used to gather data from people about opinions, beliefs, and feelings about situations in their words (Ary, 2010:438). Here, the researcher uses an interview to get advice and evaluation from the expert and get validated the educational product.

The third instrument is Observation. The researcher uses when try-out field testing step to know the applicability of developed product in real vocabulary learning and teaching. Also, as stated (Ary, 2010:216)," one of the most common uses of direct observation is in studying classroom behavior."

The data analysis of this research uses qualitative and quantitative analysis techniques.

The researcher uses the Likert scale to analyze the data of the students' questionnaire on need analysis and evaluating the process. Likert scale is constructed by assembling a large number of statements about an object, approximately half of which express a clearly favorable attitude and half of which are clearly unfavorable (Ary, 2010:209).

*Each item in the scale is scored as follow:*

Strongly Agree (SA)       : 5        Agree  (A)        : 4

Neutral (N)        : 3        Disagree (D)        : 2

Strongly Disagree (SD)       : 1

*Calculating the score range:*

Maximum Score       = 24 x 5 = 120 x 28 = 3360

Minimum Scores       = 24 x 1 = 24 x 28 = 672

Score Range       = 3360 – 672 = 2688

*Calculating the width class interval (P):*

   P  = R/K = 3360/5 = 672

Table 1. **Score Interpretation**

| Score | Score Range | Interpretation |
| --- | --- | --- |
| 3360 | 3360 - 3025 | Strongly Agree |
| 2688 | 3024 - 2353 | Agree |
| 2016 | 2352 - 1681 | Neutral |
| 1344 | 1681 - 1009 | Disagree |
| 672 | 1008 - 672 | Strongly Disagree |

Figure 2. **Continuum Diagram of the interpretation of the score**

| 3360 | 2688 | 2016 | 1344 | 672 |
| --- | --- | --- | --- | --- |



Strongly agree     Agree        Neutral        Disagree     Strongly disagree
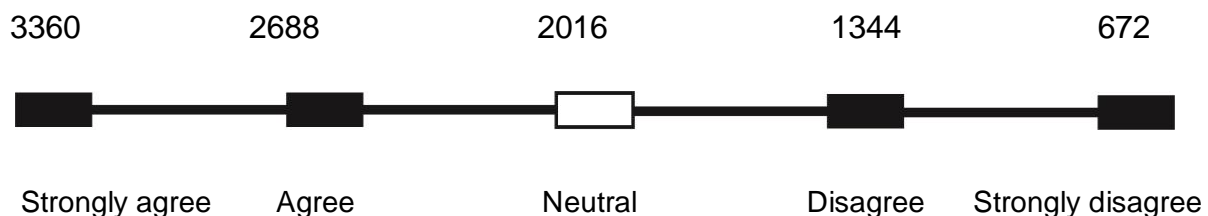
Data observation and interview analyzed by using qualitative way. It means that data services in a detail explanation to get a conclusion based on the data. Sugiyono (2015:334) stated analysis data is the process of gather and arrange the data, so there is information that can be informed to others.

## FINDINGS AND DISCUSSIONS

From the research done by the researcher. The finding is elaborated as follow:

**Finding on Field-Testing**

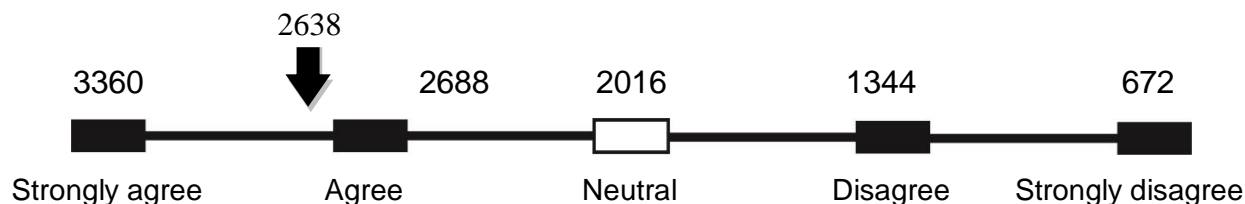Figure 3. **Continuum Diagram of Need Analysis**



Table 2. **The Finding on Students Need Analysis**

| Finding on Students' Need Analysis Questionnaire | • Nearly 96% of students neutral that I have mastered vocabulary 1 |
|---|---|
| | • All of the students agree that Vocabulary 1 is essential to be taught for students. |
| | • Nearly 92% of students agree that with many mastered vocabulary, it will be helpful for English learning. |
| | • Nearly 21% of students agree that they have difficulties when learning vocabulary 1 |
| | • Nearly 50% of students agree that they need vocabulary learning media |
| | • Nearly 53% of students agree that Learn vocabulary with a smartphone is pleasurable |
| | • Nearly 28% of students agree that Nowadays, every student has a smartphone. So, mobile learning is more efficient for learning vocabulary |
| | • Nearly 25% of students agree that Online interactive learning material is better than a conventional book |
| | • Nearly 82% of students agree that Interactive media must be easily accessible anytime and anywhere |
| | • Nearly 71% of students agree that it is important to use interactive media |
| | • Nearly 92% of students agree that illustrated materials are needed in vocabulary learning |
| | • Nearly 71% of students agree that small size online materials are required |
| | • Nearly 89% of students agree that Interactive media must easy to understand |
| | • Nearly 96% of students agree that interactive media must have a clear explanation |
| | • Nearly 89% of students agree that vocabulary media must have complete content |
| | • Nearly 85% of students agree that Low-cost operation is needed |
| | • Nearly 46% of students agree that I enjoy learning vocab with interactive media |
| | • Nearly 32% of students agree that I feel comfortable to read vocabulary one book anyplace |
| | • Nearly 92% of students agree that interactive media must easy to operate |
| | • Nearly 46% of students agree that interactive e-learning media for vocabulary is motivating |

- Nearly 89% of students agree that fast response interactive media is important
- Nearly 89% of students agree that Interactive media must have to the point explanation
- Nearly 96% of students agree that Interactive media must be up to date
- Nearly 92% of students agree that they need interactive learning media of vocabulary lesson

## Finding on Material Development

### Figure 4. **Finding on Material Development**
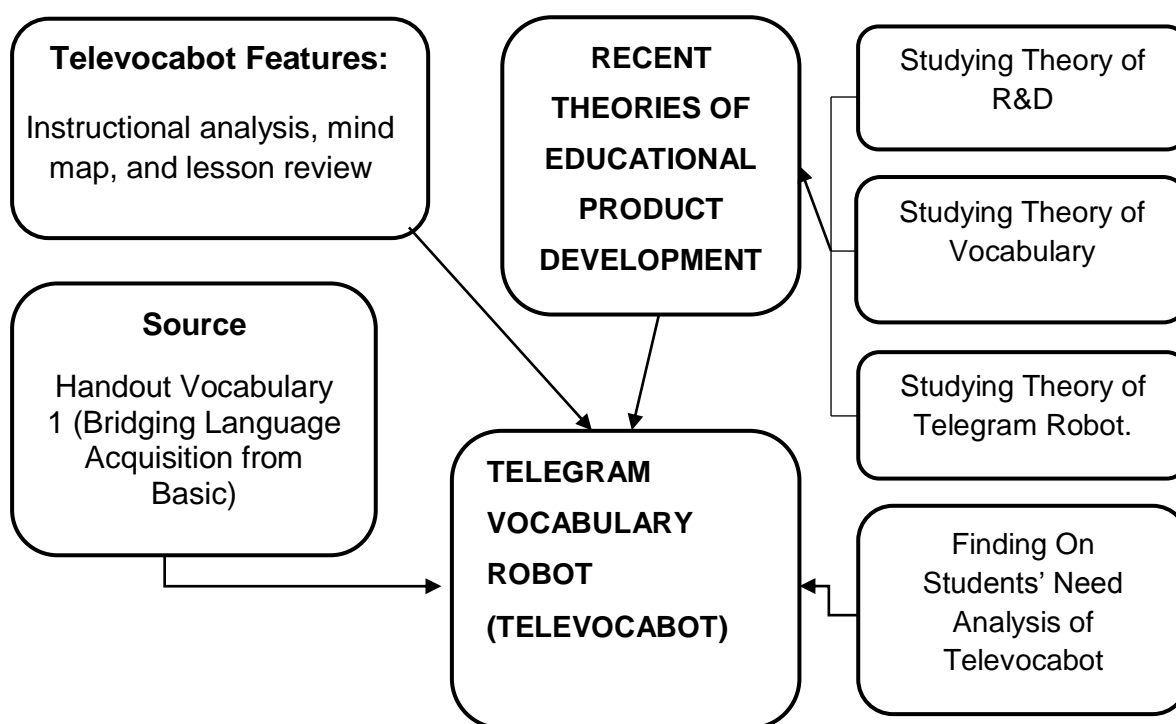


## Finding on Expert Validation

After the product was developed completely, the researcher consulted the product to the expert of English language material development to give evaluation and suggestion to have acceptable and approved product. The researcher met up with Mr. Yudi Basuki, M.Pd. as the expert to validate this product. The expert give a judgments, he argued that the product was good enough but need more revision. The researcher met the expert twice (on May 06, 2019 and May 08, 2019) to get the Televocabot validation.

Moreover, the expert give the evaluation to the researcher. The first, he stated that researcher should re-design the command layout. The second, the expert found speed mistakes when open the picture. The third, there are some picture that not match with topic . The fourth, the expert ask to check the spelling. The next, the expert ask the researcher to complete the material in the product.

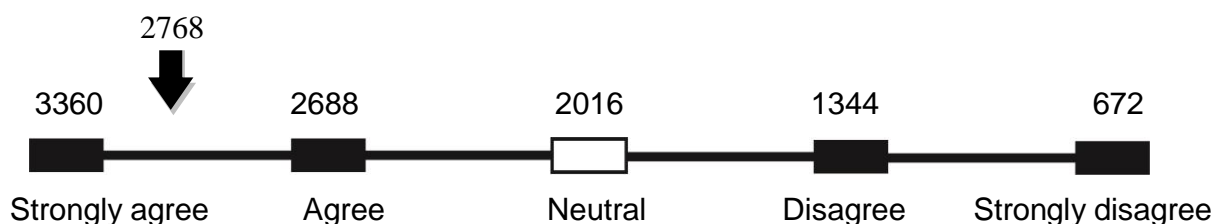**Finding on Field-Testing**

Figure 5. **Continuum Diagram of Field-Testing**



Table 3. **The Result of 1ˢᵗ Questionnaire on Field-Testing**

| Finding on Students' Field Testing Questionnaire | • Nearly 85% of students explained that the first display of Televocabot is good |
|---|---|
| | • Nearly 96% of students explained that the layout of Televocabot 2 is good |
| | • Nearly 96% of students explained that the respon speed is good |
| | • Nearly 92% of students explained that the theme of Televocabot is good |
| | • Every student explained that the effectiveness of Televocabot is good |
| | • Nearly 92% of students explained that the style and size of the font in Televocabot is good |
| | • Nearly 92% of students explained that the picture and the color choice of Televocabot is good |
| | • Nearly 92% of students explained that material complexity in Televocabot is good |
| | • Nearly 92% of students explained that the material organization of Televocabot is good |
| | • Nearly 96% of students explained that the material description of Televocabot is good |
| | • Nearly 96% of students explained that the instructional learning of Televocabot is good |
| | • Nearly 89% of students explained that the illustration and examples given in Televocabot is good |
| | • Every students explained that this product develops the students learning motivation |
| | • Nearly 96% of students explained that this product gives the chances for students as center of learning (SCL) |
| | • Every students explained that this product is up to date |
| | • Nearly 89% of students explained that this product is suitable with the printed |
| | • Nearly 96% of students explained that the language style in the product is good |
| | • Nearly 92% of students explained that the punctuation in the product is good |
| | • Every students explained that the grammar in the product is good |
| | • Nearly 96% of students explained that the spelling in Televocabot is good |
| | • All of students explained that the coherence in the product is good |
| | • All of students explained that the diction in the product is good |
| | • Nearly 89% of students explained that this product is easy to understand |

Table 4. **The Result of 2nd Questionnaire on Field-Testing**

| No Item | Questionnaire's Item | The Most Feedback |
|---|---|---|
| 1 | Pengadaan Televocabot sesuai dengan kebutuhan mahasiswa | Yes : 28 Respondents<br>No  : 0 Respondent |
| 2 | Pengadaan Televocabot mengurangi ketergantungan terhadap guru | Yes : 18 Respondents<br>No : 10 Respondents |
| 3 | Konten dalam Televocabot disusun secara baik | Yes : 28 Respondents<br>No : 0 Respondents |
| 4 | Beberapa isi Televocabot sesuai untuk belajar secra mandiri maupun berkelompok | Yes : 26 Respondents<br>No : 2 Respondents |
| 5 | Televocabot memiliki tampilan yang menarik | Yes : 25 Respondents<br>No : 3 Respondents |
| 6 | Isi dari Televocabot sesuai dengan level mahasiswa | Yes : 27 Respondents<br>No : 1 Respondents |
| 7 | Topik dari Televocabot sesuai dengan konteks | Yes : 28 Respondents<br>No : 0 Respondents |
| 8 | Topik dari Televocabot mengikuti perkembangan zaman | Yes : 28 Respondents<br>No : 0 Respondents |
| 9 | Dengan Televocabot, kemampuan dalam berkomunikasi dapat dikembangkan | Yes : 28 Respondents<br>No : 0 Respondents |
| 10 | Materi dalam Televocabot digital dapat ditangkap dengan mudah | Yes : 26 Respondents<br>No : 2 Respondents |
| 11 | Fitur dari Televocabot sangat bermanfaat untuk pembelajaran dalam kelas | Yes : 28 Respondents<br>No :  0 Respondents |
| 12 | Mahasiswa memiliki waktu untuk melakukan penguatan dari materi dengan Televocabot | Yes : 27 Respondents<br>No : 1 Respondents |
| 13 | Televocabot direkomendasikan untuk mahasisa STKIP PGRI Trenggalek | Yes : 28 Respondents<br>No : 0 Respondents |

Based on observation when field-testing, the researcher found that the lecture and students look interested while trying this product. They follow all steps given by the researcher with easy. They could operate this product efficiently. This product gives a chance to the students to study vocabulary anytime and anywhere.

## Discussion

Based on the research finding explained above, the discussion of the findings on this research are elaborate as follows:

Table 5. **The Discussion of the Research Finding**

| | Discussions |
|---|---|
| **TELEVOCABOT: An Interactive Vocabulary Learning Source for College Student of English Language Education Department** | Regarding to the content material of this research they are; instructional analysis, mind map, and lesson review, that was in line with the expert explanation. |
| | Regarding to the product development steps on this research that took five steps was in line with expert explanation they are; need analysis, studying recent theories of education product development, developing the educational product, validating the product to expert and field-testing the product. Latief in Basuki (2017:21) stated that there are five procedures of development. They are need analysis, studying recent theories of education product development, developing the educational product, validating the product to expert and field-testing the product. |
| | Regarding to the product of this research (Televocabot) that was in line with the students' need that was explained in the finding above. |
| | Regarding to the form of product (E-learning) on this research was in line with expert explanation. E-learning is a communication technologies that provide some facilities to enhance knowledge, learning and to access online learning/teaching resources (Pande et al. 2016:275) |

## CONCLUSION AND SUGGESTION

The outcome of this research is the Telegram vocabulary robot (Televocabot). The research procedure was adapted from Latief, (2012:172) in (Basuki, 2017:21). Thus, there are five steps conducted to create a Televocabot as media in this research. They needed analysis, studying recent theories developing the product, validating the product to experts, and field-testing the product. First, Televocabot was done need analysis step, then the result of need analysis shows that the score is nearly agreed on a Likert scale. Second, a researcher studying recent theories about the theory of Research and Development, the theory of e-learning, vocabulary, Telegram, and theory of the usage of Telegram bot. Third, the developing product is done by need analysis, and the content of this product was adapted from Vocabulary 1 coursebook. Fourth, The product had been validated by the expert who gave evaluation and suggestion. Fifth, field-testing was conducted to know the implementation of the product toward the English education department. The findings of the field-testing shows that the product gets the proper responses from the teacher and the students. They were satisfied with it. Televocabot was implemented and useful in the teaching and learning process of a vocabulary lesson.

In conclusion, based on the finding of the research explained above. This research has been able to answer the research question that states; How to develop Televocabot (Telegram Vocabulary Bot) as an interactive vocabulary learning source for a college

student of English language program?" Furthermore, this research has been able to achieve the objective of the research, which is to develop a Televocabot (Telegram Vocabulary Bot) as an interactive vocabulary Learning source for a college student of the English language education department.

After giving the findings and conclusion explained above, there is some suggestion for people who finds some benefit of this research. The first is for the teacher or lecturer who has the coursebook of their subject. It is better to create own Telegram robot, for it can help you and your students to access the lesson anytime and anywhere. The second is for the students learning English; it is suggested to you to use Televocabot to make your study better. The last is for the next researcher who may use the research finding of this research as the information and reference for their research.

## REFERENCES

Adom, D., Hussein, E, K., Joe, A, A. 2018. *Theoretical and Conceptual Framework: Mandatory Ingredients of a Quality Research*. International Journal of Scientific Research, 7 (1). (Online) (https://www.researchgate.net/publication/322204158). Accessed on February 10, 2019

Alqahtani, M *(2015). The importance of vocabulary in language learning and how to be taught.* International Journal of Teaching and Education, Vol. III (3), pp. 21-34., (Online),( https://www.iises.net/international-journal-of-teaching-education/publication-detail-213). Accessed on the march, 10, 2019.

Ary, D., Jacobs, L. C., Sorensen, C., 2010. *Introduction to Research in Education*. Wadsworth: Cengage Learning

Basuki, Yudi. (2017). *The Requisite Vocabulary 1 Material for College Students of Stkip – Pgri Trenggalek.* Jurnal Pendidikan Dewantara. Vol 3 No. 1 (2017), (Online: http://journal.stkippgritrenggalek.ac.id/index.php/kid/article/view/81/43)

Basuki, Y & Yeni, N.H. (2019). *Kahoot! or Quizizz: the Students' Perspectives*. Proceedings of the 3rd English Language and Literature International Conference (ELLiC) (2019) (Online: https://www.researchgate.net/publication/334358438_Kahoot_or_Quizizz_the_Students'_Perspectives)

Cucus, A & Aprilinda, Y. 2016.Pengembangan E-Learning Berbasis Multimedia untuk Efektivitas Pembelajaran Jarak Jauh. Jurnal system informasi dan telematika, 7 (1). (Online), (www.ubl.ac.id) accessed on January, 27, 2019.

Deepali Pande, Dr. V. M. Wadhai, Dr. V. M. Thakare. 2016. E-Learning System and Higher Education. *International Journal of Computer Science and Mobile Computing,* 5 (2). (Online)(www.ijcsme.com) accessed on January 27, 2019.

Hanlon, B, and Larget, B., 2011. *Samples and Population.* University of Wisconsin-Madison: Department of Statistics. (Online)(http://www.stat.wisc.edu/~st571-1/03-samples-2.pdf) Accessed on February 20, 2019.

Horton, W., 2006. *E-Learning by Design.* San Francisco: Pfeiffer. Https://core.telegram.org/bots Accessed on December 29, 2019.

Jurnal Kejuruteraan, Teknologi, dan Sains social. 2017. Vol. 1 Issue 1(Online) (https://books.google.co.id/books?id=v55xDwAAQBAJ&pg) Accessed on January, 29, 2019.

Kline, T,J,B. 2005.Psychological Testing a Practical approach to design and evaluation. California. Sage Publication

Saribekyan, Hayk dan Margvelashvili, Akaki.2017. *Security Analysis of Telegram.* (Online)(https://courses.csail.mit.edu/6.857/2017/project/19.pdf). Accessed on February 4, 2019.

Sugiyono. 2015. Metode penelitian kuantitatif, kualitatif, dan R&D. Alfabeta.

Zennaro, M., Rainone, M., Pietrosimoli, E., 2017. Radio Link Planning Made Easy with a Telegram Bot. *Institute for computer sciences, Social Informatics, and Telecommunications Engineering,* (Online), (https://books.google.co.id/books?id=g9ksDwAAQBAJ&pg). Accessed on January 30, 2019.