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An instructional design for vocabulary acquisition with a hidden disability of dyslexia

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Abstract

The aim of the study is to design an effective instruction build on the Dick and Carey Model and game-based learning that enables an undiagnosed language learner of dyslexia, facing problems in vocabulary acquisition to acquire a pre-defined number of vocabularies in a given time. The method of the curriculum development study is based on a case study in a real-life context with quantitative and qualitative evidence that relies on multiple data collection tools such as checklist, interviews, questionnaire and report cards of the learner. The results of the study demonstrated that the capability of the dyslexic learner can be increased to acquire 55 vocabularies in a week, the same number expected from their peers. The performance increase of the learner can be attributed to a new method of learning English vocabulary through game-based learning supported with spaced repetition.

Keywords: Instructional design, learning disability, dyslexic learners, game-based learning.

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1. Introduction

The research problem in this study is on a 35-year-old undiagnosed adult learner of dyslexia, who is in a language preparatory school of a university and facing problems in vocabulary acquisition and is required to acquire a pre-defined number of vocabularies in a given time (55 words in a week), and is unable to do so. The gap is evident from the learner's required level and her actual status which is a minimum of less than 14% (minimum 65% to maximum 100%). The gap is also self-expressed by the dyslexic learner as having difficulties to remember, describe and match words, which corresponds to remembering knowledge of the cognitive domain. Problems in vocabulary acquisition may also indicate a problematic vocabulary teaching since many teachers are not confident about the best practices in vocabulary teaching, and at times, they do not know where to begin to form an instructional emphasis on word learning (Berne & Blachowicz, 2008). As Laflamme (1997) indicates, the importance of the problem derives from the fact that vocabulary knowledge is the single most important factor contributing to reading comprehension and academic success (Peeples et al., 2018).

In this connection, the aim of the study is to design an effective instruction build on the Dick and Carey Model and game-based learning that enables an undiagnosed language learner of dyslexia, facing problems in vocabulary acquisition that contributes reading comprehension and academic success, since there is a need for a design for individualised instruction to be implemented for self-learning, which could also be generalised into group-based instruction both for English language learners with dyslexia as well as anyone experiencing difficulties in vocabulary acquisition. To serve this need, a new method of learning English vocabulary through a game-based learning, aiming to present the learner with an engaging experience (Khezrlou, 2018), has been designed based on pedagogic teachings and Dick and Carey System Approach and implemented to a mild dyslexic learner. To ensure that dyslexic learners to benefit from inclusive education (Nijakowska, 2019), the method can be implemented to group-based instruction for anyone experiencing difficulties in vocabulary acquisition in a classroom setting without the need to change the content of a language curriculum.

2. Methodology

In the research methodology of the quantitative case study, it is focused on the following research question: 'does an instructional design based on the Dick and Carey Model increase English vocabulary acquisition of learners of dyslexia'? The curriculum development based on the case study illustrates how a learner's weak vocabulary acquisition skills are related to her academic achievement. The stages of curriculum development are as follows:

2.1. Participants

The sample of this study is a 35-year-old mild dyslexic adult learner, who is unable to proceed with her second Bachelors of Art in Public Relations as her vocabulary acquisition and memorisation skills hinder her ability to acquire vocabulary. This is the second time that she is doing her BA; in her previous university, the medium of education was in Turkish. At the beginning of the 2018–2019 academic year, the learner started the English Preparatory Programme in A1 level, which corresponds to the CEFR levels and objectives. At the end of the first module, she was unable to get a minimum passing grade of 65, and in the second module, she attended the A1 repeat level. She was successful this time, and in the third module, she moved on to A2 level, However, again she was unable to fulfil the requirements of the level and studied in A2 repeat level in the fourth module. She was able to pass A2 repeat level and studied in B1 level in the fifth module. She was able to pass the B1 level with an average of 65. This means that the student is able to fulfil the requirements of the level but has not mastered it yet. In the 2019–2020 academic year, the student started studying in the B2 level.

Figure 1. English language learner of dyslexia

2.1.1. Assessing need to identify instructional goal(s)

Having difficulty with short- and long-term memory, learners with dyslexia are experiencing problems on vocabulary acquisition when learning English as a foreign language. They are not able to retain, recall and state vocabulary based on the specific themes of reading texts in a given time limit. On the other hand, according to the IDA Board of Directors (2002), 'dyslexia is a learning disability that is in relation to cognitive abilities and its secondary consequences may include reduced reading experience that can impede the growth of vocabulary and background knowledge'.

A checklist provided by Adult Dyslexia Association was carried out with the learner to determine the level of learner's dyslexia. The student, who showed signs consistent with dyslexia, scored 53 which corresponded to mild dyslexia. According to research results, most who were in this category showed the signs of being at least moderately dyslexic **(**From Disability to Diversity: College Success for Students with Learning Disabilities, ADHD and Autism Spectrum Disorder, n.d.). However, a number of persons not previously diagnosed as dyslexic (though they could just be unrecognised and undiagnosed) fell in this category. Learners with mild dyslexia can often 'get by' at school and may go on to have ordinary careers. As for Turkey, whilst most remain undiagnosed, individuals with special needs compose almost 12.29% of the total population (ERG & TOHUM, 2011), where the number of people officially diagnosed with dyslexia in Turkey stands at 41,600, according to the Turkey's Dyslexia Association. The data derived from the interview and evaluation checklist coupled with the background information in her English learning records revealed that she is a qualified candidate as a female dyslexic learner who is experiencing a problem in vocabulary acquisition, memorisation and retention.

2.1.2. Identifying problem: conducting instructional analysis

Before identifying an instructional goal for designing an instructional programme, the first step would be a need assessment of the learner. The need for assessment can be simplified as identifying the gap between the desired status and actual status, which will point out the need. It is as follows:

2.1.2.1. Desired status: One of the three domains of Bloom's taxonomy of learning includes the cognitive (knowledge) domain. The cognitive domain involves knowledge and the development of intellectual skills (Michael, Stanley & Bolton, 1957). This includes the recall or recognition of specific facts, procedural patterns and concepts that serve in the development of intellectual abilities and skills. There are six major categories of cognitive process, starting from the simplest to the most complex. Cognitive processes and levels of knowledge are remembered knowledge, comprehension, application, analysis, synthesis, evaluation and creation. Following the steps of cognitive domain, the learner is desired to acquire 50 new words for 26–28 weeks and about 1040–1120 words per an academic year through direct instruction.

2.1.2.2. Current instruction of the learner: At dyslexic learner's current level, the vocabulary learning objective is to use words related to the themes and words from the academic wordlists. The student is expected to learn (acquire information and memorise) about 50 words per week; recall and state these words correctly in weekly achievement tests. The programme provides 24 lessons for speaking, reading, writing, listening, grammar and vocabulary skills for each week. The learners are provided with a wordlist at the beginning of the term. The words along with their definitions, synonyms, antonyms, word forms, collocations and examples are all provided at the same table. Furthermore, at the end of each week, learners are given a weekly achievement test. The minimum grade, which is considered to be satisfactory, is 65 and the maximum grade that a learner can get is 100. The teaching of vocabulary acquisition is not systematic; there is no designated time for each skill. However, each week, a minimum of 2 hours is spent on vocabulary. The programme does not support special needs education for learners with dyslexia.

2.1.2.3. Need assessment – the gap: The minimum grade that is considered to be satisfactory at the achievement test is 65. Meanwhile, the minimum grade of dyslexic learner's achievement test grade is 18, which is 82% less than the best performance. The gap between the desired level (minimum 65% to maximum 100%) and actual status is a minimum of 14%. The gap is also self-expressed by the dyslexic learner during the face-to-face interview as having difficulties to remember, describe and match words, which corresponds to remembering knowledge. Remembering knowledge is the first process and level of cognitive domain. As the instruction designed does not match with the specific instruction that dyslexic learner requires facing various difficulties in learning a foreign language, and their motivation to learn a language drops significantly in traditional classrooms. According to Decoding Dyslexia Oregon Association (2018), dyslexic students can benefit from inclusive education. There is no need to change the content of a language curriculum for a dyslexic learner. One type of inclusive education strategy is called Multisensory Structured Language (MSL) Approach. As the name suggests, in multisensory approach, learning is facilitated through including all senses in the learning process. Sparks, Ganschow, Pohlman, Artzer and Skinner (1992) conducted a study to demonstrate the effects of MSL on dyslexic learners, who are learning a foreign language. The results showed significant gains on the test of foreign language aptitude, especially in phonology, vocabulary and verbal memory.

2.1.3. Analysing learners and context

To design an instruction to the needs of the learner, learner analysis is a key element of any instructional design process, according to Dick and Carey (2005). Dick and Carey have identified eight elements that instructional designers need to consider when conducting learner analysis.

To gather data about the learner and the context, the semi-structured interviews were conducted and questionnaires with the learner and the subject matter expert have been presented. A site visit has been made. Moreover, the last step (group characteristics) has been eliminated from consideration. The acquired information about the learner is defined as follows.

2.1.3.1. Entry behaviours: The learner has been studying at the preparatory school for 2 years. She is aware of the objectives and expectations of the programme. Before her current level which is B2 (intermediate), she has completed three levels of the English Preparatory Programme which consists

of a modular system of four levels (A1–A2–B1–B2). Entry behaviours such as matching letters to sounds and word recognition are the skills that are expected from the learner.

2.1.3.2. Prior knowledge of topic area: Her previous tests demonstrate that she is able to fulfil the requirements of the levels; nevertheless, she has not mastered yet. Mastering a subject is the second step of the Bloom's taxonomy of learning which includes a cognitive domain. The cognitive domain involves knowledge and the development of intellectual skills (Bloom, 1956). This includes the recognition and the ability to use specific facts by distinguishing, defining, explaining the meaning and giving an example of target vocabulary.

2.1.3.3. Attitudes towards content: Learner is positive about learning new skills to ensure that she does not confuse words anymore, understanding what is reading faster. She is aware that she needs a different system to acquire new vocabulary knowledge better and that the current teaching–learning methods are not suited for her condition.

2.1.3.4. Attitudes towards potential delivery system: The learner is notified that an effective vocabulary learning can take a significant amount of time and she would need to allocate time since rich routines for learning word meaning are critical for deep processing, as those involving comparing and contrasting word meanings, teasing out nuances of meanings, using words in writing or applying target words whilst analysing texts. In this regard, the learner is eager to try out a new method for acquiring new vocabulary.

2.1.3.5. Motivation for instruction: Learner is highly motivated towards MS and game-based learning. She wants to acquire skills to complete the English Preparatory Programme and move on to her department at the end of the 2019–2020 fall semester.

2.1.3.6. Educational and ability level of the learners: The learner is a university graduate. She completed her previous BA in her native language. The learner has minor to no knowledge or did not receive adequate English instruction in her previous learning experiences.

2.1.3.7. General learning preferences: She is a visual and kinesthetic type of learner. She prefers images, examples and illustrations, writing the material to be learned, practicing and learning through doing, practicing and acting.

2.1.3.8. Attitude towards training organisation: The learner has experience with the training organisation since she started the programme at the beginning of the 2018–2019 academic year. Her expectations are positive.

2.1.3.9. Intended Outcom –Instructional Goal: Dyslexic learner of a foreign language studying at an English Preparatory Programme at a foundational university, who is having difficulty in vocabulary acquisition, will be able to demonstrate the acquisition of 50 words a week by closing the gap between her actual status and the minimum desired level in weekly achievement tests.

2.1.4. Writing performance objectives and developing assessment instruments

To develop the performance objectives for the instructional goal, the levels of cognitive domain were examined during instructional analysis. To improve dyslexic language learner's vocabulary 50 words per week, performance skills and their subskills have been identified. For each skill and subskill performance, the objectives have been written. The chart and list of the performance objectives that are expected from the learner throughout the instructional study as well as the assessment instruments are shown in Table 1.

Table 1. Performance objectives and assessment instruments

Skills	Performance objectives	Assessment items
1. Define vocabulary words **1.1** Match the words with the picture **1.2** Match the words with the definition **1.3** Choose the correct word to complete a sentence **2.** Match the word with the synonym/antonym **2.1** State the word **2.2 and 2.3** State the synonym/antonym **3.** Identify the correct word formation **3.1.1** State the subject/verb/object of the sentence **3.1** Identify the missing parts of speech in the sentence **3.2.1** Identify the noun/verb/ adjective/adverb form of the word **3.2** Write the different forms of the word **3.3** Choose the correct form of the word	**1.** Given the terms, the learner will be able to define and use the terms correctly in a sentence. **1.1** Given the pictures and the words, the learner will be able to match the picture with the word. **1.2** Given the definitions, the learner will be able to identify the term. **1.3** Given five incomplete sentences and five vocabulary terms to complete those sentences, the learner will be able to select the correct vocabulary term. **2.** Given a list of vocabulary terms and their synonyms/antonyms, the learner will be able to match the term with its synonym/antonym. **2.1** Given a list of vocabulary words, the learner will be able to state the words that have synonyms and antonyms. **2.2 and 2.3** Given a list of vocabulary words that have synonyms and antonyms, the learner will be able to state the synonyms and antonym. **3** Given an incomplete sentence and the vocabulary term to complete that sentence, the learner will be able to select the correct form of the word and write it accurately to complete the sentence. **3.1.1** Given an incomplete sentence, the learner will be able to identify the parts of speech (subject–verb–object) of the sentence.	**1.** Students will be given five incomplete sentences and five vocabulary terms to complete these sentences. They will select the correct word to complete each sentence. **1.1** Students will be given two sets of flashcards. The first set will have pictures and the second set will have the target vocabulary words. The student will match the word with the pictures. **1.2** The students will be given two sets of five written definitions and five words that match the definition. **1.3** The student will be given incomplete sentences and will choose the correct word to complete the sentence. **2.** Students will be given two sets of vocabulary words. The first set will have the target words. The second set will have the synonyms/antonym. The students will match the target words with their synonym/antonym. **3.** Students will be given incomplete sentences. They will also be given the correct word to complete these sentences. The students will select the correct form of the word and write it without making spelling mistakes in the space provided. **3.1.1–3.1** In the given sentences the students will underline the subject–verb–object of the sentence to identify the missing part of speech in the sentence. **3.2** The student will write the forms of the word accurately on the worksheet provided.

	3.1 The learner will be able to identify the missing parts of speech to complete the sentence (noun–verb–adjective–adverb). **3.2.1** Given the term, the learner will be able to state the different forms of the word (noun–verb–adjective–adverb). **3.2** Given the term, the learner will be able to write the different forms of the term without any spelling mistakes. **3.3** Given the term and an incomplete sentence, the learner will be able to select the correct word formation and write it.	**3.3** The student will write the forms of the word accurately.

2.1.5. Developing instructional strategy

The new instruction started and continued for 3 consecutive days as soon as the target vocabulary words of the week were handed out by the teacher. During the instruction, target vocabulary was increased gradually. The learner was encouraged to keep a record of new words in one place; a small notebook or an online list dedicated specifically to this vocabulary and refers back to revise after instruction. After each instruction, a daily routine was provided to the learner for periodic reviews and repetitions.

2.1.6. Developing and selecting instructional materials

To facilitate the learning process, one-to-one training was conducted with the learner. The learner had the attention of the trainer all the time so that her strengths and weaknesses were pointed out more consistently and completely without the contest of other learners.

2.1.6.1. First day of instruction:

- Defining vocabulary words: Working on word-level reading, as a part of vocabulary acquisition makes the reading easier for dyslexic learners, therefore, practice is done on decoding (recognising sound–letter relations and words) within in troubled letters of target vocabulary. Big word cards written in 'Opendyslexic' fonts and colour overlays are given to the learner to familiarise with the word. During the word recognition practice, the meaning of the word is given directly and explicitly, followed by phonological form first (pronunciation) and spelling. 'Look, cover, write and check' activity is performed by the learner to reinforce the spelling accuracy on the vocabulary words.
- Matching the words with the definition: The learner is asked to find the definition visuals either with the support of instructional designers or within a self-study for each word from a suggested assistive technology tool and thus design flashcards based on the individual choice of explanation and description of a word. Practicing from the flashcards, with spaced repetition method, which involves practicing 3 days (first day: three times, second day: two times and third day: one time), and remembering with mnemonics based on storytelling, which is considered as a memory enhancer, the learner can match the picture with the word that it refers when given the definition to match the words or vice versa without assistance.

- Filing in the blanks with the correct word: Given incomplete sentences and words to complete those sentences, the learner can choose the correct vocabulary term to complete the sentences accurately.

2.1.6.2. Second day of instruction:

- Matching words with their synonym–antonyms: The learner is asked to find visuals of a designed game either with the support of instructional designers or within a self-study for each word from the list of synonym and antonym vocabulary below by a suggested assistive technology tool and thus design flashcards based on the individual choice of describing polarity and similarity of a word in terms of synonym and antonym.
- Stating the target word: Going over the list of vocabulary words, the learner is asked to categorise the vocabulary words into two lists of synonyms and antonym accurately.
- Naming the synonym: Going over the list of vocabulary words, the learner states the words that have synonyms accurately without assistance.
- Name the antonym: Going over the list of vocabulary words, the learner states the words that have synonyms accurately without assistance. In the second level of the designed verbal game for repetition with a printed flashcard, it was played for picturing polarity (antonym) of a word on one side and word and its antonym on the reverse side. The game is played against one or more competitors by laying the picture side on the top and word and its synonym on the bottom. In turn, anyone who can say the word or its antonym by looking at the picture collects the card.

2.1.6.3. Third day of instruction:

- Identifying the correct word formation: Emphasising that the correct form of a verb depends on the word before the verb, the tense of the sentence and the subject, an incomplete sentence is given to the learner and the learner can select the right vocabulary from the list below to complete that sentence and the correct form of the word and write it accurately to complete the sentence without assistance.
- Identifying part of speech in a given sentence: At this stage of the instruction, the learner can identify the missing parts of speech to complete the sentence (noun–verb–adjective–adverb). The learner's knowledge on noun–verb–adjective–adverb will be reinforced by giving definitions of adjective, noun, verb and adverbs as well as the role of adjective, noun, verb and adverbs is highlighted. An exercise on the formation of words in English is given to the learner.
- Stating noun–verb–object of the sentence: Given an incomplete sentence, the learner is able to state the parts of speech (subject–verb–object) of the sentence accurately.
- Identifying the missing part of the speech in the sentence: Given the term, the learner can write the different forms of the term without any spelling mistakes.
- Filling in the blanks with the correct form of the word.
- Stating the noun–verb–object of the sentence.
- Identifying different forms of the word: The learner is able to fill in a given chart practicing the below information in the given word forms of nine vocabularies.
- Word formation game chart: The game consists of forming words with the words and given suffixes whilst words are in black and suffixes are in red. Players get one point for each correctly formed word but lose all their points if they may any incorrect guessing in a limited time

2.1.7. Designing and conducting a formative evaluation of instruction

The focus of formative evaluation in this case was on the goals, objectives, instructional materials, assessment items and instructional procedures of the instructional design. To evaluate the instructional design of this study, subject matter experts were interviewed, and one-to-one evaluation was conducted. The instructional designers worked with the student to obtain data to validate and revise instructional materials, procedures and assessment items. The one-to-one evaluation also provided information on whether the goals and entry behaviours were identified accurately. Whilst the student was performing the tasks, she was observed, and the notes were taken. Before instruction

began, the student was informed about the procedure. She was asked to consider the following questions whilst going through the materials: (1) are the materials relevant to your needs and interests? (2) Do you feel confident as you work through the materials? (3) Are you satisfied with the instruction? (4) Is the instruction clear? (5) Are you satisfied with what you have learned in this instruction? And (6) are the materials accomplishable with reasonable effort?

These questions were directed to the learner to gather data on the clarity and impact of the instruction. Besides these interview questions, an observation checklist was created, and the notes were taken during the sessions by the designers. During the one-to-one formative evaluation, it was observed that there were some typographical errors within the instructional materials. Moreover, there were two pieces of content information missing from the practice test of the third cluster. During the third session, it was observed that the learner had difficulty identifying the correct forms of the target word. She needed more guidance than anticipated. When asked why she struggled, she stated difficulty with her word formation skills. More specifically, when asked to transform the word 'function' into its adjective form, she stated that she was unsure of how to transform and which suffix to add. This led the designers to observe a need to include extra instructional materials for this section. Another issue that was observed was related to time. Initially, each cluster was appointed 55 minutes of instruction time. Only a rough estimate was obtained from the one-to-one evaluation as the instruction was interrupted to take notes and ask questions to the learner. However, the instruction time for the first session lasted for 1½ hours, the second session lasted for 2½ hours and the last session lasted 1 hour. This showed a need to be more generous when regarding the timing of the instruction. The timing issue was also expressed by the subject matter experts. When instructional materials were presented to the teacher, he indicated that timing would not be enough to cover all the objectives. Assessment items were shown to both the classroom teacher and a testing and assessment expert to find out about the reliability and validity of the items. They were also validated by the learner's answers, meaning that they showed the skills that had transferred after the instruction. She accurately answered the post-test items after the instruction.

The subject matter experts were interviewed on the accuracy of the instruction and assessment items. Subject matter experts were presented with performance objectives, instructional materials and assessment instruments. The instructional analysis was not shared with the subject matter expert as it was previously discussed with the subject matter expert (SME) at the first stage of the design. There were two issues that were raised by the SME. The first one was related to the timing of the instruction. This was also observed during one-to-one evaluation and will be readjusted. The second issue was related to the scavenger hunt game, which was to be presented for the vocabulary words that the learner is having difficulty with. The SME thought that as the learner had some problems with concentration, a scavenger hunt might be too distracting and not provide effective results. Nevertheless, since the instruction was based on a multisensory game-based approach, the designers waited for one-to-one evaluation to decide on this issue. After the implementation of the scavenger hunt game for difficult words, the learner was asked whether she found the activity to be too distracting or whether she had any concentration problems. The learner stated her enthusiasm with the instructional activity, and as the literature also supports a multisensory approach for dyslexic learners, the SME's opinions were disregarded.

2.1.8. Revising instruction

Instruction time, which was previously determined as 55 minutes for three sessions, was changed as 1½ hours, the second session as 2½ hours and the last session as 1 hour because of the need to be more generous when regarding the timing of the instruction.

2.2. Data collection tools and analysis

In this study, the basic parameters are achievement test grades and demonstration of remembering target knowledge of 50 vocabulary words. The study was conducted at a preparatory school of a

foundation university in the 2019 fall semester. The data were collected by one of the eight university panel experts. The data are collected through face-to-face interviews, achievement test grades and opinions of subject matter experts (SMEs). In the analysis of the information obtained from achievement test grades, qualitative comparison analysis was used to measure the relationships between variables during the two reporting periods, whereas, in the analysis of unstructured interview data, descriptive analysis method was used to provide opinions of the learner. The following are the data collection tools of the study.

2.2.1. The data obtained from interview with the dyslexic learner

A face-to-face interview, which was conducted with 12 open-ended questions, exposed the difficulties of the learner. The learner stated that she has difficulty in remembering the target vocabulary. She specified that she always confuses words. She has difficulty in remembering the spelling of the words. She defines 'finding the correct form and fill in the blank' tasks as unmanageable for her because of making spelling errors. She misses important information whilst taking notes in listening tasks, because of listening and writing at the same time.

2.2.2. The data obtained from dyslexia checklist

After the interview, a checklist with 15 open-ended questions provided by the Dyslexia Association was presented to the dyslexic learner. The learner, who was showing signs consistent with dyslexia, scored 53 which corresponded to mild dyslexia. According to research results, most of those who were in this category showed the signs of being at least moderately dyslexic though they could just be unrecognised and undiagnosed fell in this category. Data gathered from dyslexia checklist reveal that most of the time the learner loses place or misses out the lines when reading, re-reads paragraphs to understand them, finds it difficult to find the right word to say, thinks creative solutions to problems and had time learning multiplication table. Furthermore, the learner often confuses words such as different and difficult, gets confused when given several instructions at a time and makes mistakes when taking down telephone messages.

2.2.3. Data obtained from SME

During the unstructured interview, the SME stated that the learner is a very hard-working student, attends the courses regularly and does her homework and extra learning materials that the teacher provides. Still, she is a slow learner and gets distracted easily. Moreover, she has problems, especially with memorisation and time management, and therefore, is not probably successful in examinations.

2.2.4. Data obtained from observations of instructional designers

To identify the vocabulary acquisition problem of the dyslexic learner, an observation by including senses was used by the instructional designers as a data collection method to discover anything that the questionnaires, records and SME opinions do not explain.

2.2.5. Data obtained from learning style test

To identify the learning style of the learner, a questionnaire, according to one popular theory, i.e., the VARK model, identifies four primary types of learners: visual, auditory, reading/writing and kinesthetic, which were presented to the learner. The dyslexic learner is kinesthetic, who prefers to see information and visualise the relationships between ideas and visual, who is a hands-on, experiential learner, who learns by doing a visual and who processes information that they can see better than information that they hear.

2.2.6. Data obtained from achievement test

The median of the learner's pre-instruction design achievement test grade was 18 and was 82% less than the best performance and 25 points less than minimum expected performance. Her, post-instruction design achievement test grade was 88, which was increased 22 points more although than the minimum expected performance. There is a significant difference between pre-instruction

achievement test and post-instruction and post-practice test, which indicated a considerable gain. A low score on the pre-instruction (18) and a relatively high score on the post-instruction (88) indicated the improvement of the vocabulary acquisition level of the learner with dyslexia. The learner performed significantly better after completion of the instruction.

3. Results

Data obtained from dyslexia checklist revealed that the learner has signs of being at least moderately dyslexic though could just be unrecognised and undiagnosed fell in this category. Accordingly, most of the time, the learner loses place or misses out the lines when reading, re-reads paragraphs to understand them, finds it difficult to find the right word to say, confuses words such as different and difficult and gets confused when given several instructions at a time.

An effective curriculum development based on the Dick and Carey Model and game-based learning is designed in accordance with the aim of the study. The instructional design that enables an increase in English vocabulary acquisition was applied to an undiagnosed language learner of dyslexia, facing problems in vocabulary acquisition of a pre-defined number of vocabularies in a given time, and the ability of the dyslexic learner was notably increased.

The research question 'does an instructional design based on Dick and Carey Model increase English vocabulary acquisition of learners of dyslexia'? was answered positively. The results were supported by the data gathered from pre- and post-instruction tests.

4. Discussion

The Dick and Carey instructional design model is effective for both for dyslexic learners who are experiencing difficult conditions for learning and other learners. The reasons of the effectiveness of the model are discussed as follows:

1—Dick and Carey ID model is based on instructional system development, which has a system approach composed of analysis, design, development, implementation and evaluation. In a procedural system, a series of steps receives input from the proceeding steps and provides output for the next steps. All of the components work together for the user to produce effective instruction. The system also includes an evaluation component that helps to determine whether anything went wrong and how it can be improved.

2—The Dick and Carey model is based on elements of three major theoretical positions, namely, behaviourist, cognitivist and constructivist views of the past 50 years. Moreover, to formulate a plan for instruction on what is to be taught, the model is heavily influenced by Gagne's conditions of learning which points out that if students have learned, then it is more likely that they will exhibit the desired behaviour in a given situation.

3—The Dick and Carey model has an ability to remain current by accommodating emerging technologies, theories, discoveries or procedures. Performance analysis and need assessment components of the Model reveal new instructional needs and performance requirement that must be accommodated in the instruction. The analysis of performance context uncovers new constraints and technologies used. Learner analysis discloses characteristics not previously observed. Instructional delivery options enable more efficient and cost-effective combinations of media and teaching/learning methods.

5. Conclusion

Effective instruction, which supports learners and improves academic lives (Ericson & Koppenhaver, 2019), requires systematic analysis and description of intertwined elements that affect learning and evaluation and refinement throughout a creative process. In this connection,

1—Increased efficiency of the dyslexic learner on vocabulary acquisition from 18 to 88 points can be attributed to instructional design based on Dick and Carey instructional design model with individualised instruction and game-based learning.

2—Since the designed instruction creates motivation for vocabulary acquisition and is seen as a source of success and fun, it can be adapted to non-dyslexic learners as well as other dyslexic learners of higher education of foreign language as a whole class strategy for the facilitation of vocabulary learning.

3—Since vocabulary knowledge is the single most important factor contributing to reading, the designed instruction will provide learners to enhance their reading comprehension and skills that will lead to academic success (2019).

4—The instructional model can be generalised and transformed into group-based instruction for anyone experiencing difficulties in vocabulary acquisition in a classroom setting.

5—Teachers' instruction should be improved within a professional development for awareness of disabilities and inclusive classroom (Lauterbach, Benedict, Yakut & Garcias, 2019).

6. Recommendations

Given the unconfident practices of teachers like not knowing where to begin to form an instructional emphasis on word learning, vocabulary acquisition needs to be revised and supported with the learning tools and methods of the new era (Anderson & Gallagher, 2019). Over the past decades, education has changed with increased multimedia and active-learning practices; one is game-based learning, which designed over the material to be learned, and game-based learning can be used in pursuance of improving vocabulary acquisition performance of all learners.

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APPENDIX


Identical
Functional
Elegant
a a
Optimism
Handmade
Mould
Smooth
Wooden