Using Audio-Visual Aids and Computer-Assisted Language Instruction (CALI) to Overcome Learning Difficulties of Vocabulary in Students of Special Needs

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Abstract

Objectives: To assess the effect of using audio-visual aids and computer-assisted/ aided language instruction (CALI) in the performance of students of special needs studying vocabulary course.

Methods: The performance of forty students of special needs (males and females) who used audio-visual aids and CALI in their vocabulary course at al-Malādh school for students of special needs was compared to that of another group (control group) of the same number and age (8-18). Again, subjects in the experimental group were given lessons using audio-visual aids and CALI, while those in the control group were given lessons using ordinary educational aids only, although both groups almost shared the same features (class environment, speech language therapist (SLT), etc.). Pre-and-posttest was given at the beginning and end of the semester and a qualitative and quantitative analysis followed.

Results & conclusions: Results of the present experimental study's pre-and-posttests indicated that the performance of the students in the first group was higher than that of those of the second group (34.27%, 73.82% vs. 33.57%, 34.92%, respectively). Compared with females, males' performance was higher (1515 scores vs. 1438 scores). Such findings suggest that the presence of these audio-visual aids and CALI in the classes of students of special needs, especially if they are studying vocabulary building course is very important due to their usefulness in the improvement of performance of the students of special needs.

Keywords: Language Components, Vocabulary, Audio-Visual Aids, CALI, Special Needs, Students, SLTs

1. Introduction Chapter

1.1 Introduction

Audio-visual aids and CALI are associated with the improvement of language skills be it receptive skills or productive skills or even language components (Gilakjani, 2012). These educational aids are found to be useful not only for normal students, but also for students with special needs (Iram, 2012; Kirk, et al., 2012). Explaining the reasons behind the new trend, Kirk and his colleagues have rightly observed: "Such tests, in which acoustic variability is highly constrained, may not accurately reflect spoken word recognition abilities under more natural listening situations." (Kirk, et al., 2012: p. 455)

To study how audio-visual aids and CALI affect the ability of the normal students and those of special needs, improve their productive skills, some researchers went further to investigate the process of recognizing the word in the brain before it is articulated. According to them, articulation is the ice-berg of the pronunciation process which is preceded by brain process Bradham (2012). The operation takes place, according to Bradham when "Outer hair cells provide mechanical feedback into the organ of Corti, thus enhancing the input to the inner hair cells, which predominantly send information to the central nervous system." (Bradham, 2012: Abstract)

Such findings inspired researchers to ask legitimate and reasonable questions relating to the ways information are processed in the brain and the relationship between motion representation and the visual motion system (Pavan & Baggio, 2013). More importantly, how and where does this process take place in the brains of students with special needs, especially when it comes to matters relating to deep/ surface reading for example (Wolf, et al., 2012) or those concerning Braille-reading and the way to understand issues like shape and space by blind students (Klingenberg, 2013). Onnis & Thiessen (2013)'s findings suggest that mechanisms of statistical sequential learning are implicated in language across the lifespan, and experience with language may affect cognitive processes and later learning. Others went further by investigating not only the patients, but also the role of the parents and other people around the child which results "in greater exposure to the majority language. (MacLeod, et al., 2013: p. 132)

New trends of the research in this field started to focus on physicians and nurses and the way they read, write, etc. (Khaliq, et al., 2012; Peinhardt & Hagler, 2013). Furthermore, scientists established a new trend whereby language aspects could be linked together. The study of Diaz-Maurin & Giampietro (2013) investigated the impact of grammar for assessing the performance of power-supply systems. Having the nuclear energy and fossil energy compared to each other, the researchers concluded that when considering internal constraints, nuclear energy requires about twice as much power capacity and 5–8 times more labor. Diaz-Maurin and his colleague confirmed that things do not improve for nuclear energy when looking at external constraints which may explain the difficulties faced by nuclear energy to gain interest from investors. Despite of the fact that audio-visual aids and CALI made better progress in the levels of students, some researchers are still believe in the original methods as effective means through which students can acquire language skills, notably reading,

listening and writing (Devimeenakshi & Maheswari, 2012). Additionally, pedagogical-based aids were present with more theoretical views but not with more practical use. Consistent with the existing literature on other audio-visual aids and CALI, at least film is common in the field of education (Swimelar, 2013). Knowing the prevalence of boards, notably for teaching students of special needs supplements educational interpretation and can overcome the learning difficulties they suffer from? Many studies have been conducted in this field like Gessesse & Sileshi (2013)'s study whose purpose was to examine visual semiotic signs and bill-boards and their communication implications, especially if they are used for patients . It appears to in favor of this that Gessesse and her friend have forwarded the following notification: "all the visual semiotic signs on all these billboards would give a much wider picture of the types and applications of visual semiotic signs. For another, it would also provide greater opportunities to identify the genres of messages represented through these visuals semiotic signs" (Gessesse & Sileshi, 2013: p. 246)

Students of special needs frequently encounter learning difficulties related to audio, visual or audio-visual texts. Some difficulties can be subtle but can seriously influence the students' ability to learn. The article of Brown et al., (2013) proposes that differing types of annotation offer a powerful and flexible technique for transferring the benefits of graph-based diagrams, as well as for reducing disorientation while moving around the graph and for tackling some of the inherent disadvantages of using sound. According to Brown and his friends, graph annotation may be performed automatically, creating a graph that evaluation shows requires less mental effort to explore and on which tasks can be achieved more effectively and more efficiently. Such results received high support from Chen & Yen (2013) who concluded their study by providing insights on the design and instruction, not only for written text reading, but also for online reading.

The technological features of reading software that can be used for word recognition have not been explicitly investigated, but they may not be comparable because some techniques do not follow the same distinctive features and other qualities of others. The study of Damoiseaux, et al., (2012) may be a valuable source of information for refining our understanding of some of this software in general. Damoiseaux and his friends discussed the automatic reading of anti-neutrophil cytoplasmic autoantibody (ANCA-Slides). The purpose of the research team was to evaluate the AKLIDES System. The team emphasize that the results are promising in that the pattern recognition software may play an important role in ANCA-associated vasculitis diagnostics. Some researchers investigated the idea of how blogs could be used for language purposes. The article of Álvarez (2012), for example, presents a study on the best ways of using blogs as a tool to improve students' reading and writing skills. The results showed that blogs are reliable tools for the improving students' productive skills.

A total of 186 English as second language (ESL) elementary school subjects underwent the study of Ismail, et al, (2012). The aim of the study was to dis/prove whether or not using technology helps ESL learners improve their reading and writing skills. There are significant differences in the performances of the ESL students. This can be obviously seen in the outcomes of the qualitative and quantitative analyses of the scores. According to Ismail and his team, technology might play crucial role in assisting students to learn reading and writing

skills. Other significant results, the researchers added, revealed that technology helped teachers in assigning extracurricular activities and communicating with students.

There has been growing interest recently in the use of multimedia as audio-visual aids to decode information and facilitate messages from high-dimensional scientific facts and present them to English as foreign language (EFL) students. The study of Fuenzalida & Sjöberg (2012) employed a support vector machine-based T.V approach to teach EFL students language skills, especially for young learners. Such results were supported by the study of Ahmed (2012). Gower & McDowall (2012) assessed the role of interactive video games on educating children during the study of language skills and/ or language components. Eleven subjects (9 children and 2 music specialists) underwent the experiment. The two researchers concluded their study by recommending the use of audio-visual aids and CALI as useful educative means when they are used for teaching EFL students.

In their study, Anson & Schwegler (2012) aimed at investigating tracking mind's eye technique. Anson and his colleague wanted to examine the usefulness of this strategy to be implemented for improving foreign language students' reading skill. Nevertheless, the study also highlighted the need for further research into how to improve such technique in composition studies, especially at the intersection of writing. Although currently only a few randomized controlled studies investigated the efficacy of tracking the movement of the eye, such outcomes received a great support by many researchers in the field who conducted similar studies (Henderson & Luke, 2012; Perea, 2012).

Audio-visual aids and computer-assisted/ aided language instruction (CALI) had a strong internal and external consistency on the performance of the students. The test-retest and intra- and inter-rater reliabilities were shown to be adequate when it comes to talk about the effectiveness of the audio-visual aids and CALI, and the same thing applies to discriminant validity which was good in most of the conducted studies. For new techniques related to audio-visual aids and CALI, different outcomes were found: apart from one correlation, the scores on tests assessing a language skill and/ or a language component correlated significantly with outcome measures of similar methods. One of those methods is graphic organizer method designed by Manoli & Papadopoulou in 2012. According to the researchers, the study constitutes an attempt to shed light on the research evidence regarding the effectiveness of graphic organizer on text learning and the various types of graphic organizers, which use different conventions to communicate information and are classified in various ways. The researchers finished their study by recommending ways of integrating them in reading lessons, touches on the issue of strategy instruction and its effects on language learning and leaves room for further exploration.

Learners' performance on reading comprehension depends upon what vocabulary they could understand in the texts they read. The purpose of the study of Ebner & Ehri (2013) was to examine the influence of internet, namely online sources on acquiring vocabularies which help learners increase their performance in reading comprehension. Ebner and his work mate believe that the Internet accelerates comprehension rates due to the availability of multiple resources concerning a single vocabulary term. Ebner stated the benefit of internet by saying"

Even though the Internet's unique interactive and dynamic nature can present learners with many cognitive and motivational challenges, it also has the potential to serve as an extremely powerful learning tool." (Ebner & Ehri, 2013: p.1)

Findings also suggest students to engage in Internet research to gain word knowledge. These findings received great support by Dodigovic (2013) who found such type of learning effective which requires, according to the researcher," knowledge and skills....in order to create effective electronic word card" (Dodigovic, 2013: p. 20). In fact, not only online sources are helpful for teaching vocabularies. Multimedia including all audio-visual aids and CALI are also useful, especially for programs like OpenCourseWare (Rusanganwa, 2013; Yang & Sun, 2013) as they offer what has been recently known as freedom reading choice (Reynolds & Yi, 2013). Such audio-visual aids, according to the researchers take students beyond their interesting (Karre, 2013) where more than one language skill and/ or components are implemented (Massey, 2013). Commenting on the role of some of the important audio-visual aids and CALI (mobile devices video), Hsu, et al., (2013) have rightly observed: "the use of mobile devices with videos allows the elementary school students to have more extensive opportunities to practice in order to promote their listening comprehension and vocabulary acquisition. In addition, this study also examined the learning progress of students' listening comprehension and vocabulary acquisition within the four weeks." (Hsu, et al., 2013: p. 409)

Rote memorization and semantic mapping are two important strategies in vocabulary acquisition. The question that remains unanswered is that: Which of the two techniques is more useful and effective? In order to get a crucial answer to such question, Khoii & Sharififar (2013) conducted an experimental study. Participants were 38 students of special needs who sustained different language impairments, divided into two groups, each of which used a strategy. Both groups underwent a pre-and-posttests and a comparative analysis has been conducted on the outcomes of the tests. The researchers then proved that mapping technique was not superior to rote memorization in helping the students to expand their word knowledge, thus casting doubt on the criticism targeted at rote memorization as a useful strategy for vocabulary acquisition. Such findings force the SLTs to adopt the first strategy when teaching vocabulary to students of special needs. The impact of prior learning and vocabulary instruction was evaluated at the educational attainment and mobility of low-income students.

Researchers over years provided comments on basal reading instruction, and explored various teaching methods, including teachable moments, that are used in vocabulary instruction (Sparks, 2013). The aim of Loftus & Coyne's exploratory research (2013) was to test multi-tier approach against vocabulary instruction. The study found that such approach has great potential for supporting the vocabulary development of all students, including those who are most at risk for language and literacy difficulties. The study provided an empirical evidence of how SLTs and other experts in the field can benefit from related approaches to teach students, notably those of special needs. These findings received high support from Vadasy, et al., (2013).

Students with language impairments have always been challenging. Çetin & Flamand (2013)'s study examined whether there are functional relationships between posters and vocabulary acquisition. The aim was to shed light on the posters potential of teaching beginners the second language vocabulary items. Posters, according to the outlined results of the two researchers were found to be associated with second language vocabulary acquisition, notably for primary school students. Developmental disabilities are acquired neurogenic sensorimotor speech symptom and an integral part within the clinical spectrum of aphasias' syndromes. Aphasia's measurements and disability scores generally focus on the assessment of motor functions. Since comprehensive investigations of developmental disabilities in aphasia are sparse, Smith et al., (2013) examined the capability of teaching vocabulary and concepts to students with severe developmental disabilities using early science curriculum. Three students with developmental disabilities (age= 6-8) were recruited in this study and their performance was measured by a multiple probe design across behaviors (units). The measurement was analyzed using clinical and psychoneurolinguistic methodology. All subjects underwent the same assessment applying the scale for the assessment and rating of aphasias. In the Visual analysis, results showed a functional relationship between the introduction of the intervention and a change in each participant's responding. Comparing the role of early science curriculum to that of the teacher's, Smith and his colleagues have clearly noted: "Although the Early Science Curriculum contained fully scripted lessons and task analyses for each lesson, the participating teacher had extensive experience using systematic instruction and requested teaching from the task analysis that was the foundation for these scripts." (Smith et al., 2013: p. 12)

The study of Percy-Smith, et al., (2013) examined the capability of young children to comprehend language vocabularies. This claim was examined in a sample of young children born in Denmark between January 2005 and January 2011with a minimum of 6 months. The majority of hearing impaired children in Denmark received hearing aids before six months of hearing. These findings provide preliminary insight into the phenomenon that the language gap is not closed in two years after implantation. Sigrist, et al., (2013) addressed the importance of technical display as means through which motor learning is enhanced, recommending using these audio-visual aids in addition to CALI. According to the research team, such audio-visual aids and CALI are important means that should be extensively used for teaching language skills due to their usefulness that can be clearly seen in the EFL students' multimodal feedback.

Vocabulary perception can be described as the transformation of continuous readable information into discrete memory representations through eyes. Therefore, research on acquisition of words is particularly important for a better understanding of this transformation. Techniques for vocabulary learning make specific assumptions regarding the acquired vocabulary items and other entries that are acquired. One of these techniques is Moodle Reader technique that has been used by Alavi & Keyvanshekouh (2012) to promote extensive reading (ER) in an Iranian EFL context, emphasizing its effect on students' incidental vocabulary acquisition. To this end, Alavi and his colleague used 38 Shiraz University sophomores by dividing them into an experimental group and a control group. One of the

outcomes of the study of Alavi & Keyvanshekouh (2012) was relating to the t-tests where it is found that using the Moodle Reader improved the experimental group's incidental vocabulary acquisition, having a stronger effect on production as compared to recognition vocabulary. These findings demonstrated a significant relationship between the experimental group's vocabulary production and their use of vocabulary learning strategies. Such results were taken to reflect an abstract long-term acquisition of lexicons that do not include redundant specifications at very early stages of acquiring the words. In this regard, the two researchers emphasize: "As these results suggest, the experimental group's gain scores for vocabulary recognition were already high at the beginning of the experiment and did not improve greatly at the end of the program, a finding which might be attributed to the ceiling effect implying that the members of this group had a high level of vocabulary knowledge from the beginning. Thus, the improvement observed in their vocabulary recognition was not too high. Regarding production vocabulary, however, the learners had obtained quite low scores at the beginning of the experiment but improved significantly at the end, hence showing the effectiveness of the experiment on this aspect of incidental vocabulary acquisition." (Alavi & Keyvanshekouh, 2012: p. 139)

1.2 Aims of the Study

This study attempted to test the main and interaction effects of using audio-visual aids and CALI in the performance of students of special needs in vocabulary building. To this end, the researcher aims to find answers for the following questions:

1.   What are the audio-visual aids and CALI that can be used for teaching students of special needs language in general and vocabulary in particular? To what extent can SLTs benefit from them when teaching this class of students? What are the best methods that can be effectively used for implementing these educative aids in a way that guarantee improving students of special needs' performances.

2.   Compared with those who do not use them, do audio-visual aids and CALI make any difference when they are used for teaching vocabulary to students of special needs? Are there any results of other studies that agree or contradict the findings of the present study?

1.3 Methodology

Eighty students of special needs of both sexes (age ranges between 8-18 years old) were enrolled in this experimental study. The subjects were randomly divided into two groups; each group consists of 40 students. Nearly all students suffer different types of aphasias. They underwent a course on sound system, for a semester (4 months) at al-Malādh school for teaching students of special needs in Dhamar city, republic of Yemen. The purpose of the study was to examine the effectiveness of audio-visual aids and CALI when they are used for teaching language components in general and vocabulary building in particular. Before and immediately after the first vocabulary lesson, the subjects under investigation performed a pre-test and at the end of the semester, another post-test was administered to them by their SLT who was teaching the two groups at the same school. In between the treatment, the first group studied using audio-visual aids, while the second group studied using ordinary methods

(chalk and black boards). Outcomes of the two tests were linguistically and statistically assessed. In this regard, social program for social sciences (SPSS) was implemented to describe the frequencies.

2. Analysis

2.1 Using audio-visual aids and CALI to teach students of special needs language components in general and vocabulary building in particular

Educative aids are frequently used in language practice to help students learn very well. Recently, psychoneurolinguists and speech language therapists (SLTs) have realized that using these aids is of special importance to students of speech needs. These divided the practical part of these educational aids into two broad categories:

1. Conventional aids.

2. Computer learning in language teaching.

A very legitimate question that poses itself in this regard is the following:

Why do we use aids in language teaching in general and what are the benefits of using them for students of special needs? To answer such reasonable questions, one needs to understand that aids can be used for many language purposes. Some of these purposes can be listed as follows:

1. Attracting attention (especially of those who are suffering from scansion).

2. Maintaining attention. (Mainly, for those who are suffering from problems related to myo-edema.

3. Clarifying concepts and meanings of words and utterances (especially if the target group belongs to those who are suffering from tetartanopia, and tritanopia).

4. Increasing chances of remembrance.

5. Time saving (1 picture is worth 1000 words).

6. Adding varieties to class activities.

7. Compensation for the lack of experience in teachers (e.g., bringing pictures for throat to compensate for his inability to draw).

8. Individualizing learning and teaching (e.g., giving students cassettes to be listened to at home or program instruction which takes forms like the book, for example, which is the simplest form and which contains some forms that have some bits of information and each bit of information has its feedback in the margins, etc.

9. Involving learners: Either by asking them to participate in class activities or by using pattern practice which can be done by computer recording. Consider:

- John is reading a book.

- Mary…………………

Instant feedback varies according to the situation e.g., I'm sorry, good answer, well done, excellent, try again, etc.

10. Presenting authentic language e.g., listening to a native speaker, giving menus to the students, recordings of airport's announcements, news, etc.

11. Simulation of language use (e.g., acting, dramatization, etc.).

Clearly, educational aids can be used for different purposes. We can use them for teaching language skills and language components. In detail, educational aids can be used for teaching oral skills (listening and speaking) and written skills (reading and writing) and components of language (sound system, grammatical structures and vocabulary building). Such audio-visual aids and CALI that can be used for teaching those who are suffering from motor problems. These include: Myofibrosis, myolysis, myomatosis, tritanopia, stenostanopia, and myorrhexix. Educational aids for teaching language skills and language components fall into five major types: Visual aids, audio aids, audio-visual aids, action (e.g., dramatization, field trips, debating, etc.), and multi-media (Computer-assisted language learning/ instruction/ teaching (CALL/I/T)).

A: Visual aids: This type takes different forms and shapes:

1- Realia (Real things). This includes chalk, board, chair, etc.

2- Three dimensions models (e.g., trains).

3- Pictures or drawings: These can be photographic or hand drawn. There are different types of pictures:

- Simple pictures: Pictures of cars, pens, books, etc.

- Composite pictures: Pictures of scenes in classes, movies, etc.

- Series or sets: For example, telling stories, process of doing something (cooking, manufacturing, experiment, etc.), pictures of transportation means, etc.

4- Posters: Usually consists of picture and text (e.g., posters of "No Smoking").

5- Maps: These include geographical maps (used for topographical purposes), political maps, city plans, floor plans, etc. SLT can use city plan for example and ask the student who suffers from dyslexia to follow his instructions by drawing lines on the places he/ she is talking about.

6- Boards: There are many of them like smart boards, white boards, black boards, etc.

7- Cards: These include flash cards (where the picture is in one side and the word is in the other side), reading cards, and question & answer cards, etc.

8- Graphs: One of the most famous graphs is the pie graphs. Pie graphs are normally used for statistical purposes.

9- Forms: To be used by students who are suffering from dysgraphia for example. Examples of forms: Immigration forms, customs forms, hotel forms, etc.

10- Menus: Restaurant menus that can be used to teach mentally handicapped students something about cultures, traditions, folklores, etc.

11- Slides: Overhead projectors (OHP) slides and 35 mm slides are some of the example for this type of visual aids. Many of the above mentioned visual aids can be converted into slide forms and then presented to the students of special needs to achieve some class activities.

12- Film strips: It is a set of slides like picture series. SLTs can also make use of silent films.

13- Comic books: Examples of this type are children books, stories, etc. that can be used to entertain children, notably those who have problems relating to dyscalculia. Such type also attracts the attention of students suffering from dysarthria and prompts them to speak.

14- Facial diagrams: Diagrams to be taken from books like phonological books or even by drawing them on the boards for teaching purposes like teaching articulation for those who are suffering from pronunciation problems.

15- Clock, face, and hands: By asking the students to assign the time according to the question or vice versa. Such types of activities help dyscalculic students learn better.

16- Calendars: For counting days of the week, months of the year, numbers, etc. Again, such drill helps those who suffer from dyscalculia.

17- Letters of the alphabet and numbers: For teaching spelling, recognition of the letter, etc.

18- Cross-word puzzle: For teaching vocabularies. We also have scrabbles. Learning vocabulary items is very helpful for those who have developmental aphasia.

19- Tables & schedules: These include time table, flight schedules, tec. Linking information to each other helps those who have global aphasia as it strengthens their abilities to speak and comprehend.

B: Audio-aids: Some audio aids that can be used for students who have language difficulties are:

1. Cassette recorder or radio: Such audio aid is typical, notably for those who have problems related to Wernicke's aphasia as it helps them comprehend what they are listening to. Those who suffer from conduction aphasia may benefit from these cassettes also as they have to repeat the words and / or phrases they are listening to. In others, they do not have to listen to themselves and repeat their own sentences more than one time.

2. Phonograph records: It is an old version of compact discs (CDs).

3. CDs.

4. Conversional language labs: In this kind of labs, one can have all the above mentioned audio aids.

C: Audio-visual aids: The most obvious types are T.V, videos, and also digital versatile disc (DVD) which has almost the same function as the video tape. Sophisticated language lab is another audio-visual aid. In this kind of labs, students of special needs can have both recording and playing. They can also have the facility to speak and listen at the same time and then compare that. Another characteristic of these labs is the facility of instant repetition. Sound movies are also some other types of audio-visual aids. These movies are now replaced by video tapes. Sound movies are the opposite of silent movies. SLTs can mute the sounds so that movies can be functioned for speaking or with the sound for listening. Slide/ sound synchronization is another type of audio-visual aids. In this type, students of special needs can have both sound and picture and this is used to be one of the methods used in the past and is called in French "La method audio-visuelle". Such educational aids are suitable for those who are suffering from problems relating to myorrhexis, myosalgia, myosclerosis, myoseism, myositis, and myoseism.

D: Action: This is good and useful for those who are suffering from myositis, myotenositis, and myotonia. It takes different shapes and forms:

1.   Dramatization (physical action) like walking, standing up, etc. Such exercises are helpful for students suffering from Alalia. However, if the SLTs notices that his/ her student cannot act the action, then they can ask them (using sign language when necessary) to pantomime or imitate.

2.   Charade: Charade is a good exercise due to those students of special needs enjoy it so much. In this type of exercises, SLTs are supposed to play a role of something and their students predict what it is.

3.   Party games: Many of them can be used be used as means for teaching language skills in general.

4.   Language teaching games: They can be found in magazines, etc.

5.   Field trips: They teach students of special needs some vocabularies. Students of special needs can also get practical experiences with them.

6.   Role playing: It is a good example of actions.

7.   Physical response: It is considered one of the ways of performing actions.

E: Multi-media aids (CALL/ CALT): They are combination of all the above mentioned aids including the use of internet, etc. Nor must we forget some general programs like T.V, radio, etc. SLTs should also pay attention to the use of computer as only one aspect of aids in language learning.

It is important, however, that SLTs know the best ways to use the above mentioned educative aids in teaching language to their students of special needs. Some requirements for proper use of these educational aids (selection & use) are as follows:

1.   Aim (objective): In this regard, SLT should ask himself/ herself "Why am I using this aid in particular (a picture for instance)? Why not another/ other aid(s)?"

2. Effectiveness: Again, SLTs should ask themselves questions regarding to the effects (positive, negative, or side effects). Examples of these questions are: How effective is the use of this educative aid? What shall I do to make that educational aid more effective bearing in mind time, environment, students' levels, individual differences, types of language disorders, etc. For example, a documentary art subject will help students with dysmnesia remember things: Should I use it as a whole or just segment it in sections? When shall I use it? Shall I use it at the beginning, in the middle or at the end of the class?

3. Resources: Questions relating to the availability of the educational aids. These include: Where can I get the educative aid (s)? Are they available in toys' stores, bookstores, or internet?

4. Preparation: Making sure whether this educational aid is useable or not (usability of the educative aids and the best way (s) to use it.

Let's take an example of using these educational aids for teaching vocabulary. Lexically, words (including idiomatic expressions) have some aspects:

1. Form: This includes spelling form, morphological form, (e.g., stem), pronunciations (segmental and supra-segmental features (e.g., pronouncing the word calendar with wrong stress), and syntactic structures (e.g., phrases, idiomatic expressions, multi-word vocabulary items, etc.). Some audio-visual aids and CALI for teaching word forms to students of special needs include: Pictures, posters, realia, letters of the alphabet, board games like scrabbles, cross words puzzles that compare words with meanings, OHP (with or without multiple layers), matching cards including stems, prefixes, suffixes, transcriptions, etc. Games can also be used for teaching forms: Example:

Circle the odd word:

a.   Speak-window-desk-pen.

b.   On-tennis-in-under.

c.   Beautiful, amicable- tragic-badly.

d.   We- they- democracy-she.

e.   Write- listen-drive- bus.

Imitation and repetition can also be used for teaching word forms. From a psychological viewpoint, all the above mentioned audio-visual aids and CALI can be used to teach students of special needs in general and those who are suffering from dysorthography, dyspraxia, paragraphia, and dyslexia in particular.

2. Meaning: Word meaning includes dictionary meaning, denotation meanings, connotation meanings, primary and secondary meanings, synonymous and antonymous words, contrasting words, definitions, hyponyms, homonyms, polysemy, semantic fields, examples in illustrative context (s), transitions, etc.

Among the audio-visual aids and CALI that can be used by SLTs to teach word meaning to students of special needs, one can find, for example, realia, models (three dimensions) and

pictures (two dimensions, including simple pictures, composite pictures, and sets or series). Actions (e.g., swimming, sleeping, etc.) miming, graphs, drawings, maps (including geographical maps, biz maps, GPS maps, etc.), floor plans, opaque projectors, film strips, slides, etc., are also some examples. SLTs can also make use of games, tables, matching words with pictures' exercises and all what can be used to combine spelling with sound to create meanings. Examples:

Circle the odd word:

a.   Eraser-pen-milk-desk.

b.   Banana-apple-book-orange.

c.   Father- car-mother-sister.

d.   Soccer- tennis, basketball, dictionary.

e.   Doctor- cow- artist-police offer.

Dictionaries in all their kinds are also important. These include: written dictionaries (e.g., Webster, Longman, Al-Mawred, Oxford, etc.), talking dictionaries (e.g., Encarta, contemporary, etc.), and digitized dictionaries (e.g., Sakhr, Easy-lingo, etc.).

3. Contextual Use: It happens sometimes that the student of special needs may be familiar with the word, but he does not know the way to use it. In this regard, SLTs are recommended to advise their students to use thesaurus (dictionary for meanings) or what has been known nowadays as the dictionary of synonyms. For usage, SLTs can use realia, models, pictures, graphs, maps, computers, concordances (key word in context (KWIC)), etc.

4. Collocation Use: It is an important aspect of lexical knowledge and it happens when certain words go together. Some examples of this type of word aspect include: make friends, pay a visit, school of fish, flock of birds, etc. SLT should explain to his/ her students the difference between collocation and connotation (secondary meaning). Examples:

a. He is pig.

b. She is flower.

c. We are rocks.

d. You are chicken.

e. They are cows.

Unlike collocation, connotation depends on cultural aspects. Using of words and collocations can be taught by matching cards, flash cards, picture sets, using words in sentences, role playing, posters (a picture accompanied by words/ sentences), tables, calendars, etc. Additionally, SLTs can also make use of synonyms of the key word (special font, underscoring, different color in a sentence, multiple choice (MC), list of words, testee's own or true/ false (T/F). All what have been said about the synonyms applies to antonyms, hyperonyms, hyponyms, homonyms, translations, definitions of words, etc. Monolingual

dictionaries can also be implemented, especially for definition of words' exercises. For semantic field, SLTs can use odd words in groups, group words according to the field, etc. They can also make use of matching words with pictures/ parts of pictures (MC list) or giving names of pictures/ parts of pictures/ pictionaries. Such drills are important for students who are suffering from myotonus, neuroretinitis and ophthalmopathy. .

SLTs can ask their students of special needs fill-in-blank questions (MC, list of words, or testee's own, etc.). Matching words drills are also important, especially for collocations. They can benefit from OHP and smart boards to show concordancers, wordsmith, etc. While in concordancers SLTs use a list of KWIC, in word list, they only use lists of words. As a matter of fact, SLTs has more than one option: They can, for example, use word count, frequency count, etc. They can also import/ download a corpus/ corpora from the internet. Using of direct download (DDL) is also another alternative choice. Benefiting from different types of games including cross word puzzles is also among the choices. In fact, the use of computer itself (along with all these kinds of drills and exercises) is a sort of games. It should be noted here that such exercises are important to those who are suffering from myriachit, neuroretinopathy, laloneurosis and optesthesia.

2.2 Audio-visual aids and CALI: Effects in the performance of students of special needs

In recent years there has been significant interest in the use of audio-visual aids and CALI as effective educative aids through which difficulties in language components could be overcome in people with aphasia and other language deficits. However, more limited consideration about whether or not these educative aids can help students of special needs learn lexical issues and overcome difficulties to vocabulary building and/ or acquisition. To this end, the researchers undertook the current study wherein two tests (pre-and-posttests) were implemented to see the differences between the outcomes of the performance of the groups involved, i.e., treatment group (N-40) and the control group (N-40). Table 1 sums up the scores of the above two mentioned groups. Consider:

Consider:

Table 1. Performance of the subjects in the pre-test: Comparison between the treatment and control groups

No	Treatment/ Experimental group				Control group			
	Subject Name	Subject Sex	Subject Age	Subject Score	Subject Name	Subject Sex	Subject Age	Subject Score
1	Saleh	M	18	34	Nada	F	15	12
2	Majed	M	12	23	Hajar	F	14	47
3	Saqr	M	14	46	Hamas	F	8	23
4	Ali	M	8	45	Rashad	M	12	23
5	Amatallateef	F	12	27	Omar	M	9	56

6	Amatala'leem	F	9	19	Ashraf	M	16	23
7	Badr	M	13	20	Mohammad	M	11	54
8	Tareq	M	14	39	Montaha	F	14	34
9	Parees	F	15	27	Ayman	M	13	50
10	Bayrout	F	9	35	Aayah	F	10	29
11	Tammaah	M	9	28	Adham	M	10	38
12	Taher	M	17	39	Nasser	M	11	18
13	Baraah	F	16	36	Haylah	F	17	18
14	Abrar	F	11	24	Tawfeeq	M	13	25
15	Ahmad	M	13	56	Nour	F	12	34
16	Fatimah	F	16	27	Najeebah	F	18	18
17	Amatillah	F	18	38	Radha'a	F	16	39
18	Abdullateef	M	8	29	Wafa'a	F	15	35
19	Amriyah	F	12	28	Wajedah	F	15	49
20	Abduljaleel	M	12	39	Sultan	M	9	38
21	Kareemah	F	11	39	A'simah	F	12	27
22	Nadiyah	F	11	38	Adalah	F	11	26
23	Sariyah	F	13	49	Abulwali	M	8	25
24	Sarah	F	13	57	A'amal	F	8	34
25	Huda	F	18	45	Salah	M	12	29
26	Sulayman	M	15	54	Ammar	M	13	18
27	Amjad	M	14	12	Luluah	F	18	47
28	Abdullah	M	11	28	Bilal	M	14	38
29	Abdulmajeed	M	16	35	Ziad	M	12	38
30	Raghad	F	15	27	Ruqayah	F	18	37
31	Hafsah	F	14	18	Asma'a	F	15	16
32	Abdurrahman	M	14	28	Sumayah	F	17	44
33	Akram	M	14	24	Kawthar	F	13	45
34	Taqwa	F	13	29	Khawlah	F	14	48
35	Salma	F	12	26	Tasneem	F	18	23
36	Hadiyah	F	18	34	Amal	F	10	52
37	Sayda	F	18	54	Sami	M	10	18
38	Abdulkareem	M	16	23	Haneen	F	10	23
39	Sadeq	M	8	27	Ayham	M	16	56
40	Motaz	M	10	65	Sajidah	F	18	36
Total	40 (20 M+20 F)		530	1371	40 (20 M +20 F)		525	1343
Mean		- -	13.25	34.27%		- -	13.12	33.57%

Clearly, Table 1 demonstrates the validity and reliability of the research. Nearly results of the two groups (experimental group and control group) are similar (1371 scores, i.e., 34.27% vs. 1343, i.e., 33.57%). It remains unclear why the two groups did not register low levels (below 10 scores). Similar thing could be said about the good levels both groups achieved. As is seen in the above mentioned table, five subjects from each group got more than 50 scores. Ahmad, Sarah, Sulayman, Sayda, and Motaz from the treatment group, for example, all received more than 50 scores (56, 57, 54, 54, 65, respectively). Likewise, Omar, Mohammad, Ayman, Amal and Ayham from the control group received similar scores (more than 50 scores) and this can be obviously seen in their scores (56, 54, 50, 52, 56, respectively). Nor must we forget to indicate here that the performance of the two groups (experimental and control group) of both sexes was different (Males= 694 and 547 (treatment and control groups); females= 677 and 796 (treatment and control groups). A good explanation for such scores is that this is evidence that the reliability of the research is ensured. However, the outcomes of the table can be more clarified in light of those of Table 2. Consider:

Table 2. Performance of the subjects in the post-test: Comparison between the treatment and control groups

No	Treatment/ Experimental group				Control group			
	Subject Name	Subject Sex	Subject Age	Subject Score	Subject Name	Subject Sex	Subject Age	Subject Score
1	Saleh	M	18	78	Nada	F	15	33
2	Majed	M	12	56	Hajar	F	14	13
3	Saqr	M	14	89	Hamas	F	8	23
4	Ali	M	8	89	Rashad	M	12	65
5	Amatallateef	F	12	56	Omar	M	9	47
6	Amatala'leem	F	9	75	Ashraf	M	16	28
7	Badr	M	13	34	Mohammad	M	11	36
8	Tareq	M	14	67	Montaha	F	14	24
9	Parees	F	15	87	Ayman	M	13	33
10	Bayrout	F	9	56	Aayah	F	10	34
11	Tammaah	M	9	89	Adham	M	10	29
12	Taher	M	17	87	Nasser	M	11	18
13	Baraah	F	16	45	Haylah	F	17	15
14	Abrar	F	11	68	Tawfeeq	M	13	12
15	Ahmad	M	13	90	Nour	F	12	45
16	Fatimah	F	16	98	Najeebah	F	18	38
17	Amatillah	F	18	76	Radha'a	F	16	36
18	Abdullateef	M	8	45	Wafa'a	F	15	37
19	Amriyah	F	12	57	Wajedah	F	15	26

20	Abduljaleel	M	12	89	Sultan	M	9	15
21	Kareemah	F	11	87	A'simah	F	12	14
22	Nadiyah	F	11	56	Adalah	F	11	23
23	Sariyah	F	13	78	Abulwali	M	8	67
24	Sarah	F	13	98	A'amal	F	8	45
25	Huda	F	18	45	Salah	M	12	37
26	Sulayman	M	15	67	Ammar	M	13	37
27	Amjad	M	14	80	Luluah	F	18	39
28	Abdullah	M	11	98	Bilal	M	14	48
29	Abdulmajeed	M	16	68	Ziad	M	12	37
30	Raghad	F	15	75	Ruqayah	F	18	27
31	Hafsah	F	14	48	Asma'a	F	15	56
32	Abdurrahman	M	14	79	Sumayah	F	17	45
33	Akram	M	14	89	Kawthar	F	13	49
34	Taqwa	F	13	97	Khawlah	F	14	27
35	Salma	F	12	68	Tasneem	F	18	39
36	Hadiyah	F	18	79	Amal	F	10	48
37	Sayda	F	18	89	Sami	M	10	47
38	Abdulkareem	M	16	98	Haneen	F	10	26
39	Sadeq	M	8	45	Ayham	M	16	34
40	Motaz	M	10	78	Sajidah	F	18	45
Total	40 (20 M+20 F)		530	2953	40 (20 M +20 F)		525	1397
Mean		- -	13.25	73.82%		- -	13.12	34.92%

Good experimental studies should be treated using approaches that recognize the relationship between the treatment group (s) against the control groups (s). Such approached can be done by implementing pre-and-posttest. Table 2 reviews the scores of the experimental group in comparison to those of the control group under investigation. It explored whether there are differences to be considered between the groups. Looking at it from a statistical point of view, one can clearly see a big difference in the performance levels of the groups at hand. Whereas the performance of the treatment group is almost doubled (73.82%) compared with the pre-test's scores (34.27%), the performance of the control group remains the same with little difference (34.92%) in comparison to the pre-test's scores (33.57%). Regardless the performance of the control groups of both sexes (males and females) (590 vs. 807), what concerns the researcher is only the performance level of the experimental groups of the two sexes where the treatment has taken its place (1515 vs. 1438). Clearly, the impact of using

audio-visual aids and CALI on the treatment group is effective. Improvements in the performance levels of the subjects in issues relating lexical acquisition is due to the use of treatment tool.

3. Conclusions & Recommendations

Aids to language teaching are of three broad categories: Conventional aids, technological aids (machines other than computer) and CALL. There are some techniques that can be effectively used for teaching language in general. These strategies can be used for teaching nearly all language aspects including the sound system, grammatical structures and vocabulary (language components) as well as teaching the four language skills and culture. Generally, educative aids are of three types. The first type includes visual aids: (e.g., realia, models, pictures/ drawings, posters, maps (geographic and city plans), boards, cards (flash cards, reading cards- Questions & Answers), graphs, forms, menus, slides (35 mm and OHP), film strips, silent films, comic books and strips, facial diagrams, clock faces and hands, calendars, charts, letters of the alphabet and numbers, cross-word puzzles, etc.). The second type is related to audio aids (including lab) (e.g., audio cassette/ tape (reel) recorders, radio, phonograph records (record albums), CDs, conventional labs. The third type is that of audio-visual aids (e.g., video tapes, TV, DVD, sound films, synchronized audio recording with visual presentations (slides), action aids (e.g., dramatization, field trips, games, pantomime, etc.) and multimedia (e.g., CALT/ L), the use of internet, interactive or not, etc.).

A very legitimate question here is: What is the importance of educative aids (Audio-visual aids and CALI) in speech language pathology? To answer such question, SLTs need to know the characteristics and benefits of audio-visual aids and CALI. Some of these features are relating to attracting attention, maintaining attention. Some SLTs emphasize that audio- visual aids and CALI can be used in matters relating to the clarification of concepts/ meanings of words and utterances. According to these SLTs, these educative aids participate in increasing the chances of remembrance by increasing means of association, saving time, simulation of language use, and presenting authentic language and natural settings for language use. Others add that audio-visual aids and CALI can be exploited to compensate for lack of experience of teachers, individualize learning and instruction, involve of learners, give variety to the lesson, and provide instant feedback.

Computers in general and computer programs in particular were found to be successful in achieving transfer of trained language abilities in speed of processing to similar untrained tasks. They can be used as means of presentation of text and also as means of presentation of exercises and feedback (and/or evaluation). Moreover, one can implement them for other educational purposes where they can be effectively used as sources of texts and also as a means of providing a record of students' progress. In addition, computers are the best educative environments where one can easily find all types of electronic dictionaries (e.g., Thesauri, Sakhr, Atlas, Longman, Contemporary, Webster, etc.). Other available electronic references include grammatical/ usage information, information sources (encyclopedia, etc.), and internet access where communication takes place with others. Strictly, internet facilities found to be useful for teaching, references, consultation, interaction with others, practicing

through chatting, learning individually or through collaboration (on assignments, etc.).

CALI requires some procedures to be undertaken before therapeutic sessions take place. Standing alone is the first procedure and this refers to two important points: Considering class complementary work, and language course (autonomous learning). Network is another procedure that SLTs should pay attention to. They should make sure that all necessary networks (e.g., local area network), internet access, supplementary materials, language course (Autonomous learning), etc., are available. Nor must we forget to add also the feature of benefiting from computer mediated communications (CMC) (e.g., e-mail, chat, distant learning), information tools (different topics, language aids like dictionaries, and/ or using computer as a tool (word processing, spell checkers, grammar checker, word count).

Programmed instruction (self-teaching/ learning) can be used to break learning task/ information into small bits, present these in frames which require response by the learner and then provide feedback by the system. In fact, a connection ought to be made between the uses of programmed instruction and CALI since the former is a part of the latter. Such uses of the programmed instruction require us to mention something about the advantages of CALI. These include: Individualization, instant feedback, combining efforts of different experts, assessment, follow-up learner's progress , providing diagnostic report on learners, provision of authentic materials, use of multimedia, combination of different resources (lexical, grammatical, cultural…) and use of corpus linguistic facilities (such as concordancers-KWIC).

Before discussing the audio-visual aids and CALI that SLTs are recommended to use for teaching vocabulary, one should understand the three major perspectives of vocabulary: Forms, meaning, and word usage and collocations. Some linguists claim that spelling, dictation and spot dictation are also included.

1. Teaching form

Activities, audio-visual aids and CALI that can be used for teaching form includes matching cards (stem and prefixes/suffixes), boards, letters to form words, scrabble, OHP (with or without multiple layers), computers, cross word puzzles, etc. Suggested drills and exercises for teaching forms vary according to the purpose of the lesson. SLT, for example, can ask students of special needs to derive words from stems/ bases (e.g., Give the verb form of the following…/ Give the negative of the words…). He/ she can also as them to recognize the similarity and dissimilarity in form/ part of speech of the head word. One more exercise is related to the identification of the words. In this regard, the SLT can ask the students to identify a word that is different/ odd in a group- morphological or syntactic basis (e.g., part of speech).

2. Teaching word meaning

There are various types of audio-visual aids and CALI that can be used for teaching meaning. These include: Realia, models, pictures, drawings, graphs, maps, action, miming, slides, film strips, computers (sound, writing, picture), games, cross word puzzles, matching cards, flash cards, picture sets/ composite picture (poster), charts for semantic association, tables, and

calendars. Teaching meaning requires a comprehensive understanding of three factors: the morphological factor, the syntactic factor and the semantic factor. Concerning the exercises recommended for this type, SLT can make use of synonym of key words (special font, underscoring, different color, etc.) in a sentence. Multiple choice question (MCQ), list or of testee's own or T/F questions are also important. SLT can also use thesaurus to ask students of special needs some questions related to the meanings he examine them in. He/ She can also ask them questions relating to antonyms/ contrasting words (e.g., husband: wife) of key word in a sentence (MC, list or of testee's own or T/F).

Hyperonym or semantic field/ hyponyms (MC, list or of testee's own or T/F or classification) are also recommended. Another type of questions is to ask the students of special needs to translate from or into target language (They can use bi/tri-lingual dictionaries, CDS and internet). Also, he/ she can ask his/ her students to define the concepts/ words in the context or vice versa (MC, list or of testee's own or T/F) (They are allowed to use monolingual dictionaries). For the semantic field, SLT can ask students to answer questions relating to odd words in a group, group of words according to the field). Alternatively, he/ she can ask the students to match words and pictures/ parts of pictures (MC, list) OR giving names of pictures/ parts of pictures.

3. Teaching word usage & collocations

Some audio-visual aids and CALI that are recommended to be used for teaching word usage and collocations are realia, models, pictures, drawings, matching cards, graphs, maps, action, miming, slides, film strips, computers (sound, writing, picture), role play, games (e.g., comparing two similar pictures), picture sets/ composite picture (poster), tables, calendars. Questions of teaching usage can be in a context (e.g., Fill blank (MC, list or of testee's own)). SLTs can ask their students to use the word in a sentence of testee's own. Matching words for collocations (eg., Herd of …, bouquet of … [sheep, flowers…]). (MC, list or of testee's own) are also some of the choices. They can also implement concordancers, speed character processor (SCP), or Wordsmith by Oxford university press (OUP). Nor must we forget here word count and KWIC for collocations. Additionally, SLTs can import/ download a corpus/ corpora from the net. Use of games, in general, is useful in this kind of written activities. Some of these are crossword puzzles, semantic field related exercises (providing words or classifying words according to fields.

Recent advances in the application of audio-visual aids and CALI in aphasic populations have led to the exploration of the new technique as an adjuvant method to classical SLTs. The purpose of the following figure is to summarize and describe the level differences in the performances of the subjects under investigation. Consider:
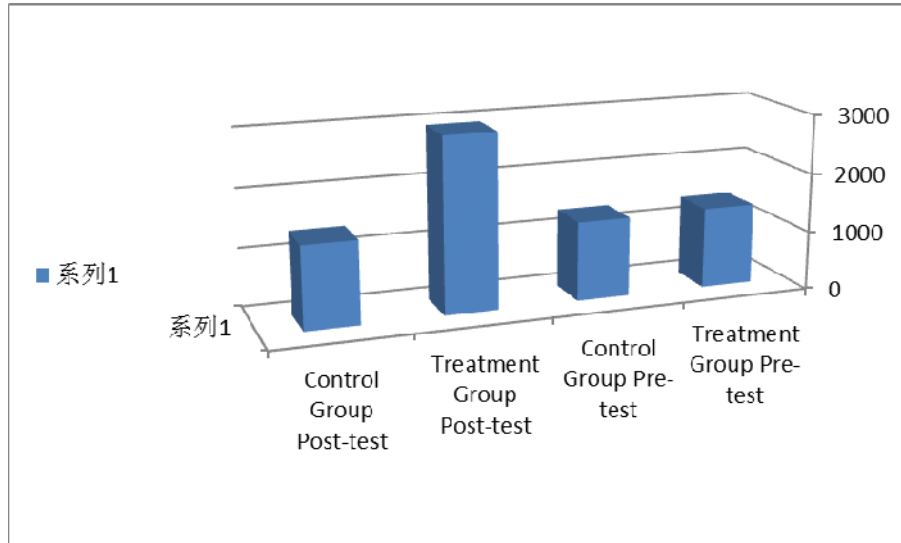
Figure 1. Results of the experimental and control groups' pre-and-posttests: Comparison

Findings from Figure 1 demonstrate that the experimental group has scored the highest marks in comparison to the control group (2953 scores vs. 1397 scores). Such findings need to be clarified more to see to what extent the sex factor plays a role. In comparison to females, males' performance level was found to be better (1438 vs. 1515). As the researcher has pointed out earlier, this may be accounted for because of the fact that language impairments vary from one individual to another which made these outcomes. The following figure explains in visual means what numbers cannot do. Consider:
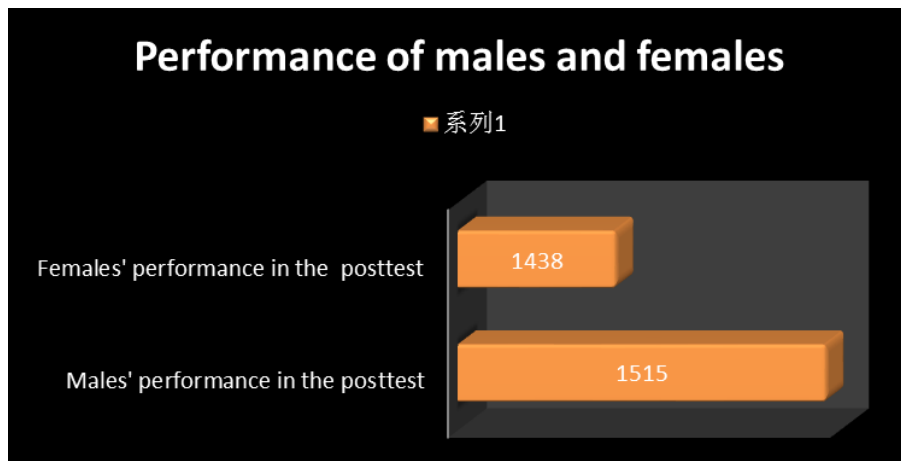
Figure 2. Males and females' performance in posttest: Comparison

These findings prove undoubtedly that audio-visual aids and CALI are effective in improving

the subjects' performance level in vocabulary building and/ or acquisition. Subjects in the control group responded very similarly to the post-test's questions the way they did to the pretest using the same techniques; that is why, their performance was almost the same. The ways of building or acquiring vocabularies are discussed in relation to the different audio-visual aids and CALI and other educational means in light of all aphasias' types. Again, Figure 1 highlights the need for more educative means for teaching language components to students of special needs. Only these educative aids learning difficulties of vocabulary items can be predicted, and then solved. This will lead to increased confidence in the selection of the appropriate audio-visual aids and CALI for people with vocabulary learning difficulties in aphasia and other language deficits. In other words, the outcome of Figure 1 illustrates the utility of this practically motivated and efficacious audio-visual aids and CALI for vocabulary building and acquisition in individuals with various types of aphasia and language disorders. Such findings support those of other researchers (Alavi & Keyvanshekouh, 2012; Gessesse & Sileshi, 2013; Brown et al., 2013; Ebner & Ehri, 2013; Dodigovic, 2013; Rusanganwa, 2013; Yang & Sun, 2013; Karre, 2013; Khoii & Sharififar, 2013; Loftus & Coyne, 2013; and Çetin & Flamand, 2013).

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Glossary

ANCA (Anti-neutrophil cytoplasmic antibodies) = These are a group of autoantibodies and monocytes that are detected as a blood test in a number of autoimmune disorders, but are particularly associated with systemic vasculitis. ANCA often "show combinations of both cytoplasmic and perinuclear staining." (Mead, et al., 1999: p.1).

CALL/I/T (Computer-assisted/aided language learning/instruction/teaching) = It is defined as "the search for and study of applications of the computer in language, teaching and learning." (Levy, 1997: p.1). While CALL is related to students, CALT and CALI "fell out of favor among teachers". In that sense, it can be said that while in the former term, the student-centered approach is the dominant perspective, in the latter; a teacher-centered approach is more preferred. CALI/T exhibits all characteristics of English language teaching (ELT) (Davies G. & Higgins, 1992: p.3).

CD (Compact Disc) = It is used for storage of data. It was in March 1974, during a meeting of the audio group, two engineers from the Philips research laboratory recommended the use of a digital format on the 20 cm optical disc, because an error-correcting code could be added." (Peek, 2010: p. 10).

CMC (Computer-mediated communication) = According to McQuail (2005), CMC is seen as "any communication that occurs through the use of two or more electronic devices." (McQuail, 2005: p.1)

DVD (Digital versatile disc) = It is a digital optical disc storage format. The DVD specification provided a storage capacity of 4.7 GB for a single-layered, single-sided disc and

8.5 GB for a "dual-layered, single-sided disc." (Thrasher, 1996: p. 16).

ESL/ EFL (English as a second/ foreign language) = It can be defined as the use or study of English by speakers with different native languages in English speaking countries. Unlike ESL, EFl refers to the teaching of English in a non–English-speaking region. Such differences occurred "during the development of English in the 1930s." (Harcourt & Templer, 2005: p.2).

KWIC (Key word in Context) = It is considered the most common format for concordance lines "especially in the phrase" (Collins English Dictionary, 2003).

OHP (overhead projector) = It is a variant of slide projector that is used to display images to an audience. In the definition of dictionary, "overhead projector is capable of projecting enlarged images of written or pictorial material onto a screen or wall from a transparency placed horizontally below the projector and lighted from underneath"(The American heritage dictionary of the English language, 2009).

SLTs (Speech-Language Therapists) = They are specialized in communication disorders as well as swallowing disorders. They are also called Speech Pathologists (Block et al., 1993, P. 23)

SPSS (Statistical program/package/product/ for social sciences/ and service solution) = It is a software package used for statistical analysis and is among the most widely used programs for statistical analysis in social science. Levesque (2007) listed some statistical operations that are normally undertaken by SPSS software. These include: "Descriptive statistics (Cross tabulation, descriptive frequencies, exploration, etc.), descriptive ratio statistics, bivariate statistics (means, t-test, ANOVA, correlation (e.g., bivariate, and partial distances), and nonparametric tests.), and prediction for numerical outcomes (linear regression and prediction for identifying groups (actor analysis, and cluster analysis.)" (Levesque, 2007: p. 392).

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