



Review

The effectiveness of distance learning systems in teaching courses for visual impaired students using smart devices and speaking programs at King Abdul-Aziz University

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Technology plays an important and active role in the teaching-learning process, especially for people with special needs, specialists in the field of special education seek continuously to provide better access to education for people with disabilities, especially visual impairments, as the blind and visually impaired in dire need of new technologies to help them receive the information, and there is an urgent need to prepare their own courses through this technology, such as distance learning. This study aimed to investigate the effectiveness of the distance learning systems in teaching courses for visual impaired students using smart devices and speaking programs. This research qualitative in nature, where the researcher used two tools to collect and analyze information: an interview and distributing a form. The study sample consisted of only from two visually impaired students, the researcher attended lectures about distance learning systems with the students in order to evaluate the appropriateness of speaking programs in teaching using distance learning systems, then he interviewed the members of the sample in order to identify the most important technical problems they face in the educational process, In addition to assessing their ability to use speaking programs in distance learning systems. The results showed that the main interface to log on to the system at the location of King Abdul-Aziz University through smart devices doesn't support access to some of the following elements: Naming subject headings, defined text fields, check boxes, buttons, links and this is for the following ten courses: conversation and listening in English course, Environment and Development course, the overall financial economics course, the administration of non-profit organizations course, e-government course, the reading in English course, youth and the values of citizenship course, the writing in English course, the Islamic culture course, and the health services management course. As for the main facade of the Blackboard as an e-learning management system at windows environment, it supports access, except for the following elements: Home Tab, courses Tab, technical support tabs, tutorials tab, for the main interface of Blackboard with smart devices: it supports the possibility of access, except the following: menu button courses, back button, and the main page of settings with the main facade of smart devices. The display of the content at Windows environment and also smart devices, the content have been displayed using PowerPoint files, it supports access but also includes some simple mistakes that must be considered when viewing content using these files to fit the visual impaired student. With respect to the recorded lectures at windows environment where the recorded lectures are displayed either with the format of mb3 or mb4, the media player doesn't support access. The results also showed that the recorded lectures at the smart devices environment where the screen reader can access to all interface elements in the recordings facade at the virtual classrooms, and the virtual classroom does not support the possibility of access to the Windows environment, and the virtual classroom supports access to the environment of smart devices.

Key words: Visual impaired students, blind students, distance learning, speaking programs, smart devices

INTRODUCTION

since the beginning of creation the man used a variety of ways, and many methods to deal in life, and understanding with the people, and in explaining the thoughts in his mind and his feelings, the man never rely on the spoken word alone, but used the graphical symbols, make them the language to communicate.

The man worked hard until we became in the technological revolution that has served everyone, and benefited Visually impaired significantly in various aspects, and as a result of this scientific and technological progress and technological techniques have emerged in the educational and professional field, which helped to offset the deficit caused by their loss of the sense of sight, where the writing tools in Braille appeared and it evolved as the machine writer who writes on paper Braille and produces Brill letters, then writing tools on the computer such electronic ruler, then it developed a high-profile characters Atmospheric plastic top of the keyboard, and finally software speaking the same sighted tools in dealing with the computer, and with multiple-language programs, enable the visually disabled to pass all obstacles to keep pace with technological advances and handle the language of the times in an age of information and communication. (Bradley et al, 2002).

Distance learning for the visual impaired students

The basic principle of e-learning is to achieve personal learning goals by acquiring skills and knowledge through computers or other network-enabled systems. The use of computers and the Internet have changed classic methods of teaching and learning, introducing the concept of distance learning as a great opportunity for studying unfettered by constraints of time and space. Although information and communication systems are helpful for implementing both the learning and teaching processes, e-learning is not merely a trivial way to transfer knowledge using electronic devices (computers, smart phones, mp3 players, etc.) while relying on the network and Web user interfaces. According to the recent concept of third-generation distance learning, the active participation of students in the formative process is an important factor in the personal learning phase (Beard & Wilson, 2002; Kolb, 1984). E-learning is a great opportunity to move from old traditional systems towards more effective and efficient methods for acquiring and transferring knowledge beyond the traditional classroom environments, adapting to the modern life and new technologies. In addition, acquisition of new skills and knowledge is not only affected by an individual's mental schemes or beliefs, but also by their interaction, cooperation and collaboration with others (Merrill, 1991). Communication and social collaboration are crucial for generating the best

learning environment. In the learner-centred model, students assume the most important role while teachers investigate and experiment more interesting and interactive ways of teaching. Another important aspect is personalization of rhythms of studying, according to student abilities. Unfortunately, learning tools and collaborative tools in general are not always designed to be effectively used by blind users, who generally interact via an assistive technology, a screen reader, using a vocal synthesizer and only the keyboard. For instance, collaborative editing of documents could be very difficult or not usable at all for blind users if: 1) they are unaware of other users' changes; 2) the formatting toolbars and other interactive elements like menus are difficult or impossible to access; 3) the list of documents is not quickly available (Mori et al., 2011).

The Problem of the Study and its Questions

Technology plays an important and active role in the teaching-learning process, especially for people with special needs, specialists in the field of special education seek continuously to provide better access to education for people with disabilities, especially visual impairments, as the blind and visually impaired in dire need of new technologies to help them receive the information, and there is an urgent need to prepare their own courses through this technology, such as distance learning.

This study seeks to find out (the effectiveness of distance learning systems in teaching courses for visual impaired students using smart devices and speaking programs).

Questions of the Study

This study attempted to answer the following questions:

1. To what extent building courses appropriate with the possibility to access to distance learning systems using speaking programs for the visual impaired students at King Abdul-Aziz University?
2. To what extent building courses is appropriate to the access to distance learning systems using smart devices for visual impaired students at King Abdul-Aziz University?

The following questions are stemmed from the main two questions:

1. What are the problems faced by visual impaired students enrolled at King Abdul-Aziz University in distance learning programs?
2. What is the impact of the construction preparation of courses in distance learning systems in the possibility of access of visual impaired students using the speaking programs?
3. What is the impact of the construction preparation of courses in distance learning systems to

access visual impaired students using smart devices?

The Significance of the Study

It is expected that the results of this study contribute to:

1. Assist faculty members in universities and professionals behind the pursuit of policies in the field of distance learning through investigating of the effectiveness of distance learning systems in the teaching of courses for visual impaired students using speaking programs and smart devices , so as to provide fertile opportunities for the training of faculty members in the training programs carried out by universities for its members during the service in the correct methods in building courses properly with smart devices and speaking programs.
2. Assist specialists to develop teaching and setup programs for workers in the service, which will have to improve the quality of programs provided to visual impaired students and enable them to integrate education effectively.
3. Planning for the construction of all subjects in distance learning systems in line with smart devices and speaking programs.

Purpose of the Study

The purpose of this study is to investigate the effectiveness of the distance learning systems in teaching courses for visual impaired students using smart devices and speaking programs.

Determinants of the Study

The students have been trained in the use of speaking programs in distance learning systems and this was observed by a number of registered courses for each student, which amounts to 5 courses for each as follows:

1. Health Services Management
2. Non-profit management services
3. Public finance economics
4. Listening and speaking
5. Infrastructure and Technology
6. Islamic culture
7. The electronic government
8. Reading
9. Youth and the values of citizenship
10. Writing

Procedural definition of Terms

E-courses: Al Jazaz defines it as "intensive e-content and the integration of multimedia, which has no limits as it extends to the presence of Links to all sources of knowledge on the not concurrent Web site.

And Clark defines it as "educational materials which

are essential part on the e-learning environment and it includes a variety of methods used to explain the lessons and information that can be brought with the consolidation of the network of Interactive multimedia elements ".

And it is defined procedurally as educational content supported by elements of educational multimedia and interactive capabilities are communicating with distance learning with visual impaired students at the higher education.

Visual Impairment

Total blindness is the inability to tell light from dark, or the total inability to see. Visual impairment or low vision is a severe reduction in vision that cannot be corrected with standard glasses or contact lenses and reduces a person's ability to function at certain or all tasks. Legal blindness (which is actually a severe visual impairment) refers to a best corrected central vision of 20/200 or worse in the better eye or a visual acuity of better than 20/200 but with a visual field no greater than 20° (e.g., side vision that is so reduced that it appears as if the person is looking through a tunnel).

LITERATURE REVIEW

Theoretical Framework

The Blackboard E-learning System

The Blackboard system is considered to be as a commercial learning management system from Blackboard Company, a production of Blackboard Foundation for Educational Services, this system is characterized by providing a variety of educational opportunities to overcome all the barriers faced by educational institutions and learners. This system provided a major support to many educational institutions to strongly spread education via the Internet, it is also characterized by flexibility and its ability to be developed and expanded. The major strength of this system comes in a number of options for the user (programmer) to choose those most suited to his/her needs, as the system offers tools allow the learner to interact with colleagues and take bigger advantage of the network capabilities. On the other hand, the system provides support for various formats of files such as Word, PowerPoint and PDF files for electronic publishing and sharing files over the network. In addition to the further advantage in providing a sample for on-line testing that allows the teacher to design different kinds of tests and diverse activities, including wiki and forums, e-mail and virtual classes (Blackboard, 2014).

The preparation of courses' content that support

accessibility through Blackboard system

When designing electronic content that supports accessibility for courses within the e-learning management of Blackboard system, the following should be considered:

First: designing the content within the Blackboard system:

- Adding headers.
- Adding table headings.
- Adding alt text for images, graphs, maps and tables.
- Adding description to the files.
- Adding video files that support close captioning option (Mason, 2014: 8-23).

Second: set the default access settings in the hypothetical classes in the Blackboard system:

Hypothetical classes in the Blackboard system include a group of disorders that enable the accessibility, these are:

1. Audible/Visual Notifications: They express the system messaging, used to inform the students about the most important events that occur within the session, audio messages which enable the student to identify some of the basic advertises, or all of the advertises, and advertises that pronounce through sound such as: start recording, the progress of recording, stopping the recording. The rest of advertises are presented by the sound of whistle that reflects some advertises such as the announcement of lifting of the hand, receiving a private message, and disconnecting the Internet, etc.
2. Sharing applications: these are of the features that provide access to students with visual impairment and carried out through hosting options that allow students to determine how to display the window of posting applications while hosting a session of Post Forum. When the teacher begins to host a student, it is necessary that the student determines the preferred color of content to display, and determining the ability to display all advertises, in addition to adjusting the presentation of the index that displays colored ring around the cursor in order to be more visible and easier to browse the content.
3. Chat: the Blackboard system allows changing the conversation text size, where the text font in the conversation or (messages) might be sized from 7 to 109 points, the default value for the font size of the text is 13 points.
4. Changing the notes text size: the Blackboard system allows changing the notes text size, which can be controlled through Notes text editor.
5. Closed Captioning: Closed captions enable the teacher to add a written description to the vocal information that is presented during the session through video, to enable participants (students) to follow all written texts on a screen by vision or

hearing, and this is done through the set to read text from the property of closed captions windows (Mason, 2014:41-48)

From the foregoing it is obvious that accessibility within the virtual classroom can be provided through the following:

- Audible/Visual Notifications
- Hosting options with sharing applications
- Changing the chat text size
- Changing the notes text size
- Closed Captioning
- Activity window which is a window for accessibility that includes:
 - Adjust the possibility of audio notification which allows students to choose from among all advertises or basic announcements only. Most notifications are alarm through audio sounds such a sound when lifting a hand, or joining for participation, but there are only some advertises that are named bands issuing sounds: the "start recording, and registration is running, and stop recording."
 - Showing all events that occur during the session in each element of the virtual classroom elements, where events related to conversation are presented, applications are shared, participants, video recording, and Web tour, and the white board, etc, and this might allow student with visual impairment to interact and communicate with the meeting efficiently.

Rating Items

First: The main interface

The access to the main interface by students with visual impairment represents the ability to reach:

1. The main interface of the site of King Abdul-Aziz University, "log on to the system."
2. The main interface of Blackboard as a system of e-learning management, which include the student's ability to move between both of:
 - a. The top window tabs which include:
 - Home: express King Abdul Aziz University web page (Deanship of e-learning and distance education), they include a range of menus such as: comprehensive menu (for student), the logging out button, and a list of quick links, and a list of general mobility. These lists are repeated continuously and consistently with each new page, in addition to the main content of the page that appears in the form of modules of student's mobility such as tools, services for students in education from a distance, Browser test, and Mobile learning update.
 - Tab Courses: includes access to the list of courses studied by the student. In addition to some of the ads on the important data for the student, such as: reminder of date of payment, and reminder not to calculating attendance for recorded lectures, etc.

- Support tab: includes unit of Technical Support for student, which serve as a communication and support module for student during the study of the courses. It also includes common and frequent questions on the use of Blackboard.

- Tutorials: include a set of lessons for students to be trained on how to use all the contents of Blackboard, this include: the main interface, presenting lectures, assessment tools, interaction tools, and virtual classrooms tab.

b. General mobility list: being able to open, and the transition between its parts, such as: "settings button, help button, releases button, updates Icon, estimations Icon, and calendar icon, etc.

c. Access to quick links.

d. Logging out of the system.

Second: Build and display the content

Represent the possibility for students with visual impairment to access the educational content of the course. Photo Showed in Blackboard system may be different, as what follows:

1. Educational elements: It allows students to browse course content through a new screen includes a table of contents, with a set of control buttons: Next button, and End button, in addition to the educational component content and a range of other buttons show you the ability to listen to your educational component in audio file, or view your component video tutorial file Show.

2. PowerPoint, Word, Pdf, and video files.

3. Links.

4. Images and fixed graphics.

5. Tables.

6. Fixed texts.

Due to this difference in methods of displaying content, it requires the teacher / faculty member taking into account accessibility in any way used in order to ensure that students with visual impairments have access to all displayed contents decision. For example:

- Access by fixed texts:
 - Freeze content movement.
 - Provide text links for each active ingredient.
 - Addressing all the window screens to facilitate the transition between the site screens.

- Providing properties that allow the user to control the font size and backgrounds (for visually impaired).

- The contrast between content and background (for visually impaired).

- The need for the appearance of the text for visually impaired students on the site; as they rarely trust the Verbal description unlike blind students who rely solely on the audio description.

- Avoid content with effects.

- Not relying on the colors in the understanding the text.

- Access by Fixed images and graphics:

- Provide alternate text of the content of the pictures with the availability of property enlarge text (for visually impaired students). Bearing in mind that there are two types of the description of the content of images, the first type: a written description of the same image through the alternative text property Alt Text, which is a short description contain one word or one brief sentence, or several sentences describing the pictures or drawings for the student with visual impairment. The second type use descriptive link which is a link placed next to the image, and used to provide detailed explanation that might be extended to a full page in the case of complex images.

- Not relying on the colors in the understanding images and graphics.

- Accessibility to tables: in order to create a readable tables, we must be observed:

- Definition of rows and columns.

- Lay hidden text title for each cell of the table place its position regarding the other columns.

- Providing summaries for tables.

- Access for Word files: to create Word files that supports accessibility, we must take into account:

- Accessibility feature in each of: titles / heading, tables, Alt Text, links, and lists of digital points and numbering features.

- Use Accessibility Checker feature in Office 2007/2013.

- Accessibility feature to convert Word files to pdf file features.

- Use Math type property to create mathematical equations that supports access in Word files.

- Access for PowerPoint ppt / pptx files: to create PowerPoint files that supports accessibility, we must take into account:

- Accessibility feature in: Alt Text, Tables, Slide Layouts and links, and lists of digital points and numbering features.

- Use accessibility in notes and diagrams Outline and Notes Panels features.

- Use Accessibility Checker feature in Office 2007/2013.

- Accessibility feature to convert PowerPoint files to pdf file features.

- Access for PDF files: to create a pdf files that supports accessibility, we must take into account:

- Use Adobe Acrobat XI software to create pdf files which supports accessibility, as they allow all accessibility features like: add alternative text Alt Text, and add the Proper Labels, logical and proper arrange-

ment for Reading and Tab order, and to develop titles for the cells or Heading Cells.

- Use software for Adobe Lifecycle designer to create pdf files that supports the accessibility for download on the Internet pages.
- Use the addition Common look Office Plug in to test all accessibility issues in PowerPoint and Word files when creating Pdf files through Checkpoint group.
- Access to video files: To add video files that supports accessibility, we must take into account:
 - Voice Description Audio Description for video files by customizing the course to Audio Description Track within the video clip that is different from the normal audio track, and this is done by using programming languages provide audio description of these presentations, such compact Synchronized language of Media Integration Language (SMIL), which is a form of multimedia, and one of the common tools to run "SMIL" a Real player software, and to display the audio description and its translation in educational Web sites while student with visual impairment use by removable media exchange through Synchronized Accessible Media Interchange (SAMI), which is a Microsoft properties through Windows Media Player program.
 - Make it possible to control the start and stop audio description by student with visual impairment.
 - Use Embed Video feature when adding video from YouTube in the Blackboard, by adding a Player Control button which allows students with visual disability to easily navigate between video control buttons, such as: play – stop - volume up - volume down - mute, making it easier to use video.

Third: Evaluation Tools:

The accessibility for students with visual impairment evaluation tools are in their ability to gain access to:

1. Homework, tasks, and interacts with them: include enabling the student to solve the tasks, and provide them either by writing it in the text editor, and use the functions of the text editor to format the text, or download the files from his/her computer browser. In addition to being able to send the homework, or save it as a draft, or save without sending it to follow the solution later, and finally review the submission record, and to approve the sending of homework.
2. Activities and interact with them: contain sent activities from teacher / faculty member to the students, and those are entered from activities link from the list of course, there are two ways to view activity: show activity in a single page or view all questions on one page, it also includes how to save and make the activity.
3. Grades and interact with them: they are accessed by going to the Tools link to each course or

through a link to a list of my grades for each course. They contain detailed grades given to students in the course.

Fourth: interaction tools:

The accessibility for students with visual impairment interaction tools are in their ability to perform all of:

1. Access to notification messages and interact with them: they are accessed by going to the Tools link to each course or through a link of notification messages list of each course or through the module scheduled major media messages page. It contains all the advertises sent by the university, or the teacher / faculty member, such as the announcement of the postponement of a lecture, or the announcement of the date of the test.
2. Access to course messages and interact with them: they are accessed by going to the Tools link to each course and clicking on a link course messages. It is a mean of communication based on fixed exchange texts between students and faculty members, they contain the Inbox to review the messages sent to each student, and outbox that allows writing and sending a message within the course of any of the colleagues.
3. Interaction with discussions panel: it is accessed by going to the Tools or discussions panel for each course by clicking on this link it show for students all forums in the discussion panel for all topics, while allowing the possibility to participate by sending a message or create a new topic.
4. View recorded lectures "Recordings": is accessed by entering a virtual classroom, where the faculty member / teacher saves recordings automatically link, students can through scheduled virtual classroom click on the recordings link and choose the lecture they want to watch and listen in their screen.
5. Tools: include a group of special tools of the course that makes it easier for students to quick accessibility, including: notification messages, calendar, discussions panel, contacts, a list of terminology, codes, messages of the course, degrees, tasks, and the virtual class, etc.

Fifth: Virtual Classes:

1) Windows Virtual classes:

Windows environment virtual classroom for Blackboard consists of the following main components: audio and video panel, participants panel, chat panel, collaboration toolbar, area content. The accessibility in virtual class for students with visual impairment in his ability to perform:

1. Open the virtual classroom: include the ability to open your default session and prepare it, and install the blackboard collaborate launcher program.

2. Interact with audio and video window: include the ability to turn on and off the microphone, adjust the sound level of the microphone, adjust speaker volume.

3. Interaction with participants window: includes access to four basic icons: icon of expressive images, icon of status control, icon of raise the hand, and Reply Icon / answer to the referendum questions, the possibility of sending private letters for colleagues, and finally reach the icons of associated interaction to give or not to give the authorization for the student by the teacher which is a microphone icon, camera icon, chat (conversation) icon, pen icon, post applications icon, globe icon. The student can understand what's allowed to him to use through a special show of permission tools. This allows the student the ability to save conversation, list of participants, and panel information separately.

4. Interacting with the chat window (Conversation panel): includes access to write the message box, access to the conversation area "displays all messages sent," the list of options (including changing the font-size separation Panel notes on the text, ...), the list of expressive images.

5. Interact with the dashboard (whiteboard): includes access to the Dashboard icon on the toolbar, use whiteboard tape.

6. Interaction with post applications icon.

7. Interact with the Web round icon.

8. Save and retrieve lectures (recorded) include the ability to save and load videos to your computer, and the ability to run and stop the recording of the whole site (Blackboard Collaborate, 2014:57-73).

2) Smart phones Virtual classes:

Blackboard Collaborate Mobile App

All the visual elements in Mobile Learn application that supports access to users with visual impairments using screen reader software, whether talk back with Android starting from version 4.1: 4.4 or voice over with Apple tools.

Virtual classroom elements vary for Blackboard Collaborate environment from smart devices for virtual classroom elements of Blackboard for the Windows environment, where they consists of the following main parts include this interface on a range of elements:

Main Content Area Screen: It includes both: menu button for chat room, conversation button, a button to display a list of participants, the main content area of display which displays the contents of the application sharing or whiteboard (does not support access), the interaction toolbar, and keyboard conversation.

Participants List Screen: It includes a list of teachers (faculty members) Moderators list that displays the names of all members of the teaching participants,

and the participants list which displays a list of the names of the students participating in the session.

Room List Screen: include leave the meeting button and it is used to record the logging out of the session, and settings button which is used to adjust the settings to connecting and disconnecting the Internet, as well as adjust the audio notifications settings Audio Alerts which express the messaging system, used to announce the students about the most important events that occur within the session, for example, audio notifications which enables the student to identify some of the basic notifications, or all of the notifications. Notifications that pronounce by sound are start recording, the recording is in progress, stop recording, while the rest of the notifications are done by the whistle sound reflects some of the notifications, such as the announcement of lifting the hand , and receive a private message, and disconnect the Internet, etc, (Blackboard Collaborate v.12, 2014; Blackboard Collaborate v.12.5, 2013).

Notes:

- The Blackboard system by mobile does not provide the possibility of sending private messages to colleagues.

- This application allows you to enlarge text area to view the content for visually impaired students.

- Voice announcement or audio alert feature supports accessibility.

- Content display area does not support accessibility to content that is shown through applications or virtual whiteboard for students with visual disability, i.e. it does not enable a screen reader from vocally read the content.

- The ability to save and retrieve sessions is not available, i.e. remembering any conversation and list of participants separately on smart devices.

- Closed Captioning feature is unavailable for Blackboard system mobile applications.

Problems related to the use of Blackboard Windows environment:

1. The problems faced by the visually impaired with the use of magnifying programs:

- The difficulty of access to the content of the page easily, because it displays a small part of the screen.

- The existence of some of the content in small size page is difficult to read the with magnifying, and therefore do not read clear vocally, so it requires the student to use speaking program, or use the shortcuts magnification browser such as CTRL ++ to read non-clear content such as small buttons.

- The difficulty to enlarge some of the texts that existing as body image when using the magnifier.

2. The weakness in the skills of the visually impaired students in the use of assistive technology with online programs, so it should be taking into account the training of visually impaired students on the use of screen reader software such as NVDA program, and programs such as screen magnifiers zoom text.

3. Failure to provide training courses of technical support to improve the visually impaired students skills to use Blackboard, training courses are available only to introduce the system, without focusing on the development of the skills needed to master the use of the system to achieve independent learning for the visually impaired student and without resorting to any sighted supporter.

4. In the list of public mobility: instructions were added for visually impaired students specialize in zoom in and zoom out text, and high contrast in the settings menu. But no other guidelines were added pertaining to visually impaired students showing them the most important keyboard shortcuts used to navigate between the contents of the Blackboard interface using programs such as screen readers NVDA screen reader software.

5. Failure to provide training courses of technical support to improve visually impaired students' skills to use the Accessibility Setup Assistant feature to browse the Pdf file.

Previous Studies

E-learning has become a hot research topic in recent years. Usability of e-learning systems and objects is a primary focus of research in this field. E-learning users can vary significantly regarding differences in learning strategies, know-how, experience, motivation to learn, user age and ability. If appropriately designed and implemented, e-learning systems are more effective and useful than classroom learning (Debevc & Bele, 2008). However, interactive learning is still difficult for persons with disabilities such as visual impaired who use assistive technologies. Various studies focus on the usability of e-learning systems and some also include a general discussion on accessibility, but to our knowledge only a few focus on totally blind persons (especially considering collaborative tools) and on visual impaired students. In (Ardito et al., 2005) the authors outlined a methodology for the rigorous evaluation of e-learning applications, but accessibility for disabled students is not analyzed. Sloan et al. proposed a holistic approach to treating accessibility. They believe that the goal of universal accessibility on the Web is inappropriate, and that instead it is necessary to explore multiple routes to equivalent experience (Sloan et al., 2006). Furthermore, Zacharias critically examined the usability of e-learning applications and proposed the student's intrinsic motivation to learn as a new usability measure (Zacharias, 2006). Developing a usability evaluation method based on a questionnaire, he carried out two large empirical studies showing the reliability of this approach. As Kelly et al. argued, rather than demanding that an individual learning resource be universally accessible, it is the learning outcome that needs to can be accessible (Kelly et al.,

2005). Based on user profiles, metadata and dynamic connection to resources, the user's experience can be customized to match his/her abilities. Then an appropriate design is crucial for improving the accessibility and usability of e-learning Systems (Kelly et al., 2005). All disabilities should be considered when designing e-learning applications. Leporini and Buzzi have discussed accessibility issues for e-learning systems (such as Learning Management Systems environments) and they have proposed empirical principles for designers developing e-learning applications in order to simplify interaction for a blind student or teacher (Leporini & Buzzi, 2007). E-learning environments should be friendly and easy to use. Furthermore, the educational material should be suitable for the abilities and skills of any user, so the same information should be provided through multiple channels, i.e. visual, auditory, and tactile. De Marsico et al. defined methodological guidelines involving users with disabilities as well as pedagogical experts in the development process, believing that input from different know-how could enrich the quality of e-learning applications and provide a more satisfying learning experience (De Marsico et al., 2006). They also include two examples of building and providing Learning Objects accessible respectively to visually- and hearing-impaired students. Rodriguez et al. described a project for improving the e-learning experience for the visually impaired, based on ethno methodology and taking into account psychosocial issues, the user context and experience (Rodriguez et al., 2006). Next they created different Learning Object formats suitable for the blind, including DAISY (Digital Accessible Information System). Within the framework of a project aimed at providing an accessible e-learning platform for disabled and adult learners, Santos et al. (Santos et al., 2007) illustrated a methodology for developing standard-based accessible courses using two-step evaluations. However, for the totally blind more specific UI features are necessary than those in this study, such as providing a page overview, full control of interface elements and easy and rapid navigation via keyboard. Some Arab and foreign studies, which tend to know the reality of the challenges facing the design and activation of the electronic courses such as the Study of Azad Ali and Scott Mensch (2008) which offered a range of issues and challenges facing the content of e-courses on the Web, where the study introduced the paradigm by faculty members at the School of business at the University of Indiana in the design of courses of the E-Learning and it explained educational design and technical educational content on the Web principles.

The study of Hassan Alebatta (2007) which aimed to develop a proposed model for the design of educational courses via the Internet, where the study offered a range of designs used by the designers of

online education with the presentation of the stages and characteristics of each design, the study concluded to develop a proposal for learning courses based on website design.

A study presented by Omwenga, Waema, (2005) showed how to develop e-content and place it in the interactive templates according to a clear model for the design of the study where the study was applied to adherents students of the e-learning programs in the School of Computer and Information in Kenya, where one of the courses was designed by using three different models. The study concluded that the integrated design has a positive effect on the achievement of these students and their attitudes about e-learning.

The study of Mustafa Jawdat (2003) aimed to build a system to offer courses via the Internet and its impact on students' attitudes toward learning built on networks where the study offered a range of design models and educational standards and related technical standards. The study concluded that the good design of electronic learning environment has a positive effect on the attitudes of students toward learning based on networks.

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The form is as the following

Rating items	Course-----			
	Windows environment		Smart devices environment	
	It supports access	Does not support access	It supports access	Does not support access
<u>First, the main facade</u>				
1. The main interface of the site of King Abdulaziz University, "log on to the system."				
2. The main facade of the Blackboard as an e-learning management system				
3. Showing the content of the main course link page				
4. View the content of information course link				
5. View the content of a link of the course professor information				
<u>second, build and display the content</u> Lectures (view - and upload files)				
<u>Third: Assessment Tools</u>				-
1. Duties / Activities				
2. Estimates (grades)				
<u>Fourth: interaction tools</u>				
1. Notification messages				
2. Discussions Panel				
3. courses messages				
4. Recorded lectures				
5. Tools				
<u>Fifth: Virtual Classrooms</u> Virtual classroom				

DESIGN AND METHODOLOGY

Sample of the Study

The sample of this study consisted of two visual impaired students from King Abdul-Aziz University during the academic year 2015/2016

Tools of the Study

1. Interview
2. Evaluation form for the courses of Blackboard e-learning system. This form is for evaluating all the ten courses which are :
 - Health Services Management
 - Non-profit management services
 - Public finance economics
 - Listening and speaking
 - Infrastructure and Technology
 - Islamic culture
 - The electronic government
 - Reading
 - Youth and the values of citizenship
 - Writing

Procedures of the Study

The researcher followed these procedures:

- Count the number of students enrolled in distance learning programs at the center of people with special needs at King Abdul-Aziz University.
- To interview the sample of the study in order to identify the most important technical problems they face in the educational process, as well as to assess their ability to use speaking programs in distance learning systems.
- It was agreed to:
 - The researcher to attend lectures through distance learning systems with the students in order to evaluate the appropriateness of speaking programs in teaching using distance learning systems, where the technical procedures by which the actual material is received using speaking programs have been identified.
 - Train students on the technical procedures for the use of a speaking program.
 - involve students with distance learning systems using speaking programs and make all that is required for a decision in order to assess their effectiveness at the same time, the researcher investigate the foundations of building a course (with the help of specialists in computer science) of the pairing between the effectiveness of reading the speaking program for distance learning systems and the appropriate foundations used in the construction of that course.
 - Re-application of the fourth and fifth procedure by using smart devices.
 - Answer the questions of the study using quantitative analysis.
 - Interpret and discuss the results.

RESULTS OF THE STUDY

The purpose of this study is to investigate the effectiveness of the distance learning systems in teaching courses for visual impaired students using smart devices and speaking programs.

Results Related to the first question: What are the problems faced by visual impaired students enrolled at King Abdul-Aziz University in distance learning programs?

The researcher interviewed two visual impaired students from King Abdul Aziz University; she asked them about the problems and challenges they face in distance learning programs. The students nearly have same problems; they both claimed that they are not well trained on using technology in general and smart devices and speaking programs in particular. In fact,

using technology with the visual impaired is new in the field, and not all the universities are well equipped, and if so, the trainers themselves face challenges in training students to use it.

Both students said they face also financial challenges because using such programs needs much time so students must also find similar devices available at their homes which is not the case.

Using smart devices needs a lot of skills and high proficiency which is not easy to acquire as the two visual impaired students claimed. This needs a long time and needs a lot of training which sometimes makes them feel boring. Anything new is not easy and needs time to get used to.

Results related to the Second Question: What is the impact of the construction preparation of courses in distance learning systems in the possibility of access of visual impaired students using the speaking programs?

The researcher used special form which is clear in the study tool (there is a sample of the form) and the electronic courses were evaluated carefully in each course. The ten courses were the following:

- Health Services Management
- Non-profit management services
- Public finance economics
- Listening and speaking
- Infrastructure and Technology
- Islamic culture
- The electronic government
- Reading in English
- Youth and the values of citizenship
- Writing in English

Results showed that the second and the sixth courses which are the Islamic culture course and the Health Services Management supports the same items nearly which are:

- **The main interface to the Blackboard as an e-learning management system environment of Windows:** the main interface supports access except for the following elements:

- **Tab Homepage:** show the lack of access to the module "Services to distance learning students" where a set of elements is displayed in the form of images and fall beneath it words that reflect the image, the display is excellent but the problem is that the pictures are not defined in the sense that the reader utters drawing expressions that stand for the picture. Therefore, the image must be defined in words that represent them and which fall under it, for example, a picture of Face book Logo falls beneath the phrase "Face book deanship" therefore the reader should utter the phrase "Face book deanship" instead of "expressive drawing."

- **Tab the courses:** Pronounce the name of the

course very lengthy as follows:
 ADS405_BA_22316_DE_ Health Services Administration - (22316) (BA) 201602, which represents a headache for visual impaired students. So you must make it possible to modify the name of the course instead of the scheduled ADS405_BA_22316_DE_ Health Services Administration - (22316) (BA) 201602 to the management of health services, because it is very annoying when it is uttered through the reader, in addition to that it also takes a long time to distinguish courses from each other.

- There are some other data within this tab other than the courses which are studied by the student, such as: Mention the date of payment of expenses, and mention in a manner to calculate attendance for recorded lectures. This data cannot be accessed by the reader, but opens only in the form of links in the list of quick links. So you must prepare and design the presentation of this data in the form of capital topics heading even easier for visual impaired students to access the keyboard shortcuts by the reader.

- **Technical Support tab:** There is an expressive drawing link about common frequent questions, it does not support access because it pronounces "expressive drawing link." So it has to be the definition of this image "link FAQ frequent questions" and then activate it.

• **Tutorials tab:**

- Does not support access to it because these tutorials were designed as Flash format, resulting in the lack of access to all the elements and the contents of these lessons by the reader. So you must use software for Flash Access that supports such as the program of: adobe flash player for the design of these lessons, making it easier for visual impaired students to access to all Flash elements and interact with them easily by the reader.

- Lessons must be designed to suit the nature of a visual impaired student, where the explanation relies on the use of each of the "main interface, and display lectures, assessment tools, interaction tools, and virtual classrooms" with Blackboard system depend on the use of assistance programs such as: "Screen-Readers programs - amplifiers."

It supports also the fourth element which is: View the content of a link set information environment of Windows: the use of shockwave-flash software to design and view content, and thus does not support access, as has been the content of the link information to be in the form of object (element) object that could be reached by the speaking program but could not be pronounced because it is displayed in the form of images, so the texts must be used for display the content so that the speaking program can pronounce it.

It supports also the sixth element which is: View

Course Contents with Windows environment: The content is displayed through two ways:

- The first way: learning to use elements of the learning object: as a way to display the content, which includes a set pattern buttons that facilitate sailing educational object, such as the Next button process, the burden of the past, the burden of ending - in addition to the list showing the lesson elements of the supply educational element. These educational elements do not support the access, where they presented the lesson elements in the form of pictures and not texts, therefore, a screen reader pronounce it.
- The second method: Using PowerPoint files, it supports access, but includes some simple mistakes that must be considered when viewing content using these files.

The researcher also found that all the ten courses support the previous three items except: Youth and the values of citizenship, reading in English, and Non-profit management services.

Results related to the third question: What is the impact of the construction preparation of courses in distance learning systems to access of visual impaired students using smart devices?

Results showed that all the courses don't support the first, third, fifth, and seventh items except the following courses:

- Writing in English
- Youth and the values of citizenship
- Non-profit management services
- and The electronic government

The items which are not supported using smart devices are as follows:

The main interface to log on to the system the location of King Abdul Aziz University in smart devices: do not support accessibility, for the following elements:

- **Naming Subject Headings:** such utter only heading level two: Do not utter Enter your user name and password.
- **check boxes:** pronounce only check box without reading the data in front of him, you must utter the reader data before the check box
- **Buttons:** Do not utter the names of buttons, speaks only button, you must know the name of the button and give it to utter: button entry, or Cancel button.
- **Links:** undefined, utters only a link, without mentioning the name of the link, you should utter: a link to change your password click here.

It also doesn't support the third item which is: The main interface of Blackboard smart devices: the possibility of supporting all access, except for: • list of courses button: "undefined", you must make a label button to utter a list of courses button instead of just a button. • Back Button: "undefined to all pages," you

must make a button label to utter the back button instead of just a button. • Page Settings main interface smart devices: "undefined" by the back button, menu button, you must perform a label button.

It also doesn't support the fifth item which is: View the content of the link information with smart devices: the use of shockwave-flash to view content, and thus does not support access, as has been the content of the link information set as an object body (element) object smart devices not be able to view them, so speaking program does not speak their content. From here you must use the texts for display the content so that the speaking program can pronounce it.

Finally, it supports the seventh item which is: display the course Contents using smart devices: does not support access, where the content has not been displayed and demonstrated "the download fails, sorry, we could not load your content" message. This is due to the use of learning the elements of learning object: as a way to display the content.

CONCLUSION

Finally, the issue of education of the disabled especially the visual impaired and rehabilitating them represents a cultural challenge for nations and societies, developed and developing alike because it is a humanitarian issue primarily could hinder the progress of nations, and its development, where the large numbers of the disabled represent educationally unconscious that threatens national and World Economy unless they are cared for and interest in teaching them such as the ordinary students. (Silver, 1995) and the current study represents a step towards the development of systemic framework to tighten the process of delivering electronic courses for the visual impaired students. Therefore, the present study recommends the following:

1. The pursuit by the higher education institutions towards the effective employment of the content of the e-learning courses and measure the benefit from it in the educational field for special groups.
2. Develop and activate the electronic design courses models to be compatible with the requirements of visual impaired students.
3. Set the standards of employment of e-courses for visual impaired students within the university policy, which is seeking to achieve in the near and long-term time plans.
4. Set the standards of e-learning in institutions of higher education in the form of an executive shape which doesn't allow publishing an electronic course to the students only after its conformity with the standards of e-courses for visual impaired students.

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