

AUTHORING SYSTEM OF DRILL & PRACTICE E-LEARNING MODULES FOR HEARING IMPAIRED STUDENTS

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ABSTRACT

Hearing Impaired (HI) persons need to keep on practicing and repeating their lessons as well as their exercises. Teaching methodology of HI students differ than normal students. HI students need to be involved in practicing more and more using their modes of visual communication like sign language to cover their audio disability. Teaching methodology of HI students recommends demonstration and repeating with slow presentations of instructional material. A teacher displays his lesson directly face to face without visual noise. More reinforcement and encouragement to HI students , fun & enjoyment should be strongly included in the e-lessons as well as continuous interaction between teacher and HI students. As per previous factors the decision of researchers is to develop Drill & Practice (D&P) e-learning modules(eLMs) for selected topics like Mathematics. D&P eLMs of Mathematics for HI persons would be the case study of this research including Developing & Evaluating.

The authors selected D&P eLMs Because eLMs match the requirements and mechanism of teaching methodology for HI students.

The mechanism of developing eLMs is represented by Developing an Authoring System which allows teachers of HI persons to generate any eLM of any selected topic for HI students. Also they can generate multiple eLMs in the project.

The evaluating producer & tools for the experimental eLMs were view points of Experts through open Questionnaire to list their evaluating comments. Besides view points of experts. There are experiments which were held in real environment of HI students to test the eLMs of D&P of Mathematics to get valuable feedback from them.

KEYWORDS

eLMs : e-Learning Modules, HI: Hearing Impaired, D&P: Drill & Practice.

1. OBJECTIVE OF RESEARCH

This research aims at :

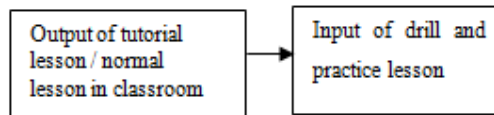
- i) Developing an Authoring System which allows teachers of HI students to generate their required eLMs of D&P lessons on desired topics for HI students. However, the generated eLMs should be enhanced with effective multimedia technique to translate all the entry material of the teacher into sign language video clips and finger spelling pictures.
- ii) Applying this Authoring System to develop an experimental eLMs of D&P lessons for Mathematics (Mathematics 2nd Standard Indian Schools).

iii) Trying / Showing the experimental eLMs of D&P lessons to Experts and teachers of HI students to obtain the needful feedback from them. Also some of HI students have tried these eLMs, another valuable feedback would be obtained.

The authors applied the eLMs in real HI school to evaluate the system.

2. DEVELOPMENT OF ELMs OF D&P LESSONS

Purpose : practicing and enhancement of skills of the learning mind, particularly to grasp the information by solving different exercises (e. g. Mathematics)



The main goal of Drill & Practice is to solve and practice more exercises of the concern topic.
Steps

Introduction → (D & P) session → select item → (Q & A) → Score/evaluation → Closing → Feedback.

Drill and Practice method is suitable for solving problems and exercises for subjects like mathematics , statistic , physics , etc.

Our Authoring System offers six exercises for the teacher. Each exercise should be presented by a question(the exercise) and three multiple choices for answering , one is correct answer others are incorrect. The teacher may enter the question with multiple choice as required by the Author system,

Also the teacher must enter the positive reinforcement for the correct answer and suitable feedback for each incorrect answer , even feedback of incorrect answer should not scold student but encourage him to try again with funny message as friendly feedback from computer to student. Particularly standard level primary school students. For HI students standard level primary school it should have more importance for eLMs so as to be friendly learning tools.

Q) How many D&P eLMs could be developed via the Authoring system?

Our Authoring system allows the instructor to generate his required number of D&P eLMs in the computer. But as experimental research work twenty D&P eLMs could be generated via the Authoring system.

The following diagram represents the general integrated diagram for drill practice eLMs.
The following diagram represents the general integrated diagram for drill practice e-learning module.

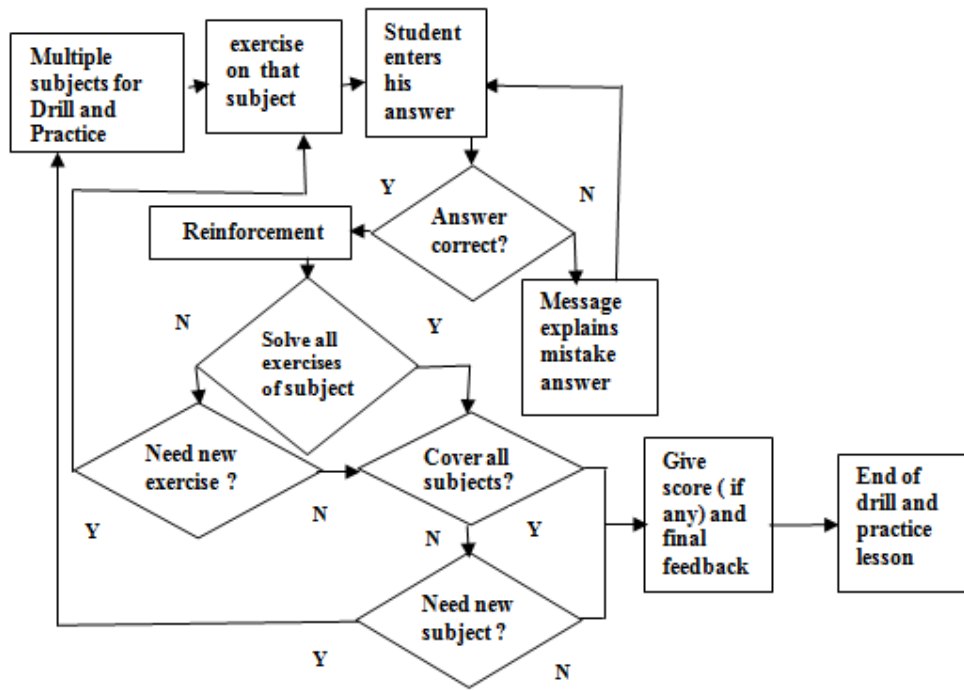


Fig .1: Diagram of Drill & Practice Method

Drill and Practice method is suitable for solving problems and exercises like Mathematics, Statistic, Physics, etc.

3. DIAGRAM OF AUTHORIZING SYSTEM OF THE RESEARCH

The Authoring System includes two projects, teacher project and student project. Both projects present an empty template. Teacher enters his exercises with required feedback and reinforcement. Student project will receive entry material of teacher in corresponding empty templates.

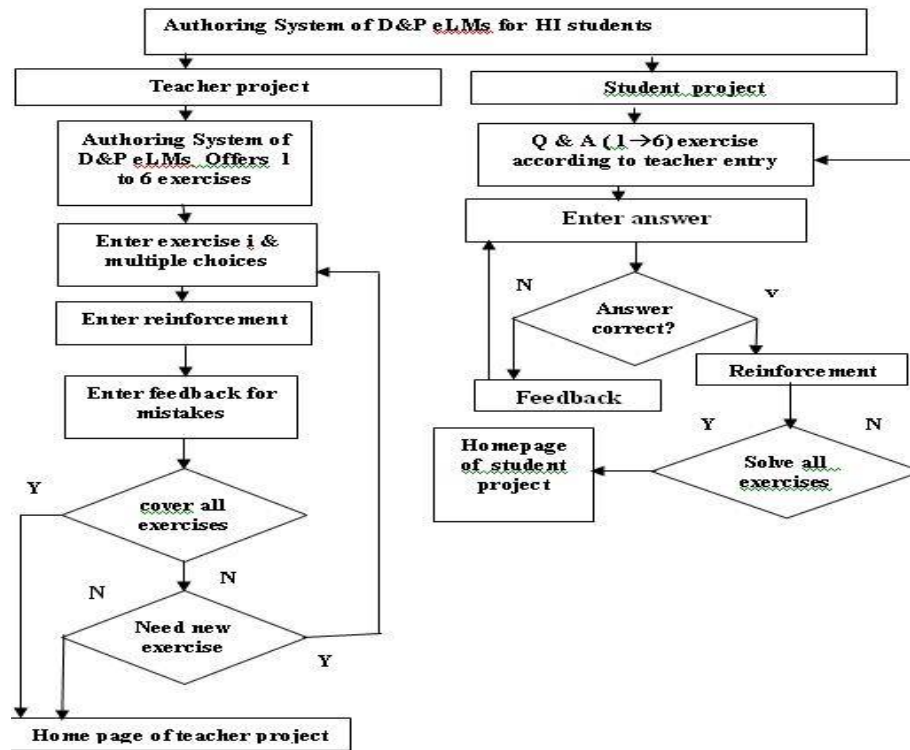


Figure.2: Block Diagram of the Authoring System Which Generates the desired eLMs of D&P for HI students

4. LIMITATIONS AND TOOLS

1- Modes of communications with HI person

- a- Sign language (Indian Sign language Standard Dictionary).
- b- Finger Spelling (ASL – American Standard Language).

2- Software and Multimedia

Around 3000 mpg video files have been linked with the system (we based on Indian Sign Language Dictionary) .

In the next section real Run-Out forms of eLMs of D&P of Mathematics would be presented as case study of the Authoring System. The generated D&P eLM includes 8 multiple choices exercises. The authors would present the 1st, 2nd and 3rd screen of teacher project and the corresponding screens of student project.

5. SAMPLES OF REAL RUN-OUT FORMS

The forms shown below represent an experimental eLM for HI students (Mathematics 2nd standard, Indian Schools).

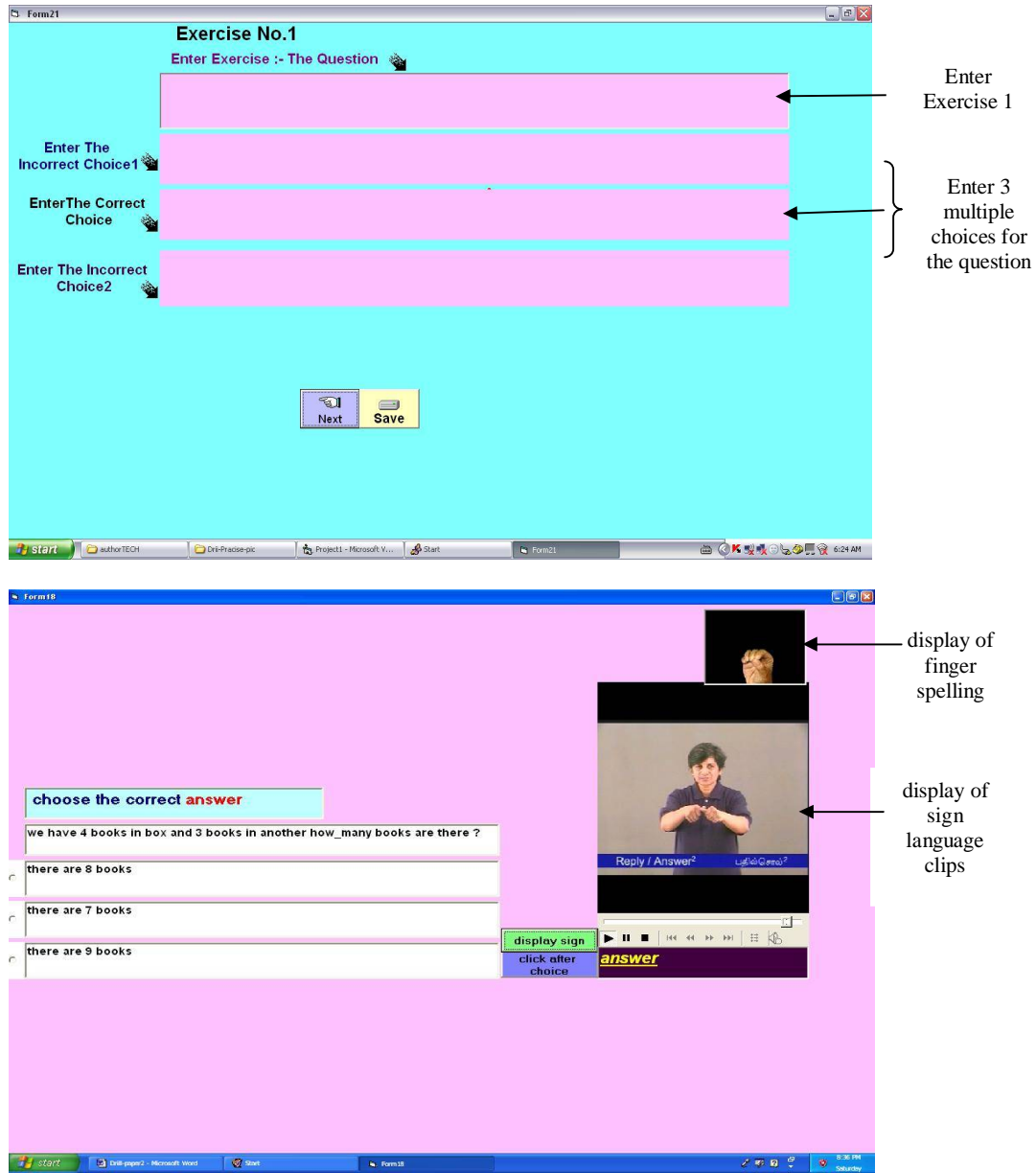
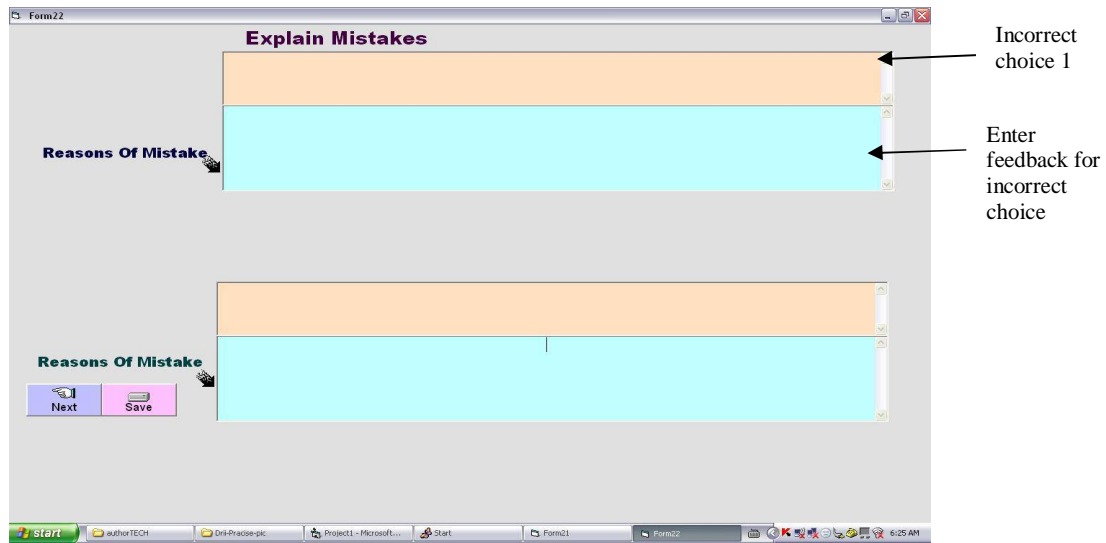
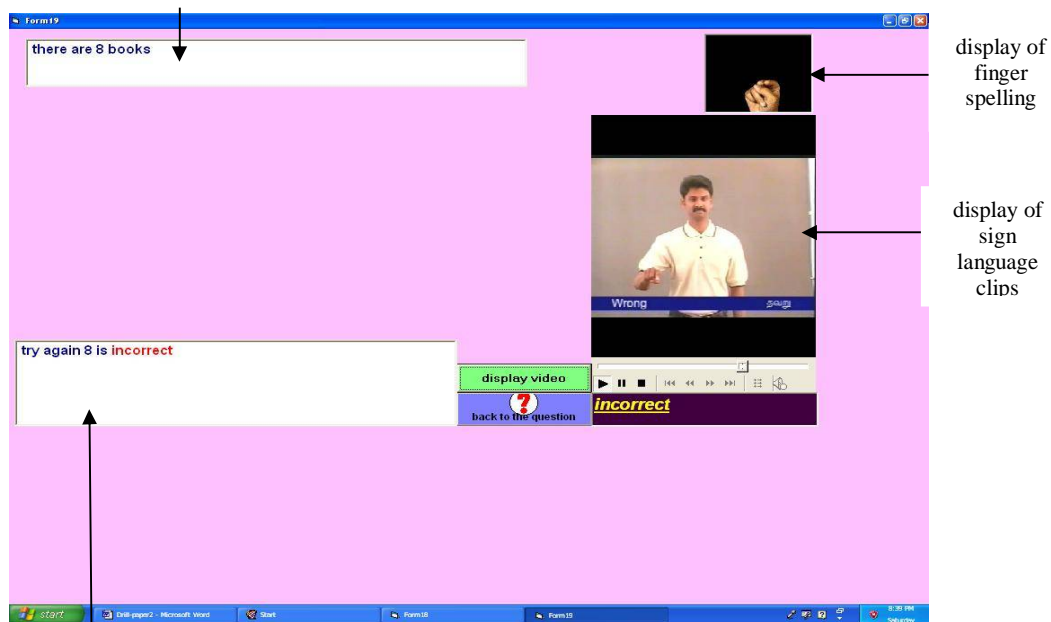


Figure.3: Form of exercisel1 and multiple-choices in Teacher Project & the corresponding Form in student project



Incorrect choice1 has been selected



feedback of incorrect choice 1

Figure.4: Form of incorrect choices and reasons of mistake in Teacher Project & the Corresponding Form in student project

6. APPLYING AND EVALUATING THE GENERATED D&P eLMs

After completing the system the authors selected Mathematics as case study. To evaluate the applied D&P eLMs of Mathematics, the decision is show/try these experimental eLMs to Experts and Teachers of HI persons then obtain the valuable feedback from them. Three different eLMs have been tried and they were successfully developed (as shown in previous pictures). Many selected experts and teachers of HI students have tried/practiced the experimental D&P eLMs.

6. CONCLUSIONS

1. The System supports the teacher to introduce the D&P eLMs for several topics to be displayed in one list on screen. The teacher needs simple basic skills of using computer also he needs not for experience in sign language or finger spelling. The teacher is asked to submit his exercises and keys of questions only.
2. Reinforcement is the key of learning. Such visual reinforcement is displayed with fun & enjoyment in our system. Also feedback of incorrect answer leads to friendly learning tool to HI learner.
3. HI learner takes the central role in the teaching / learning process via eLMs, as computer provides continuous interaction between HI learner and computer.
4. Authoring System provides individualization in teaching / learning process. It accommodates diversity through universal design.
5. The System translates the input word into sign language if the word is present in the vocabulary and displays as sign language video clip. If it is not present, it would be displayed as finger spelling letter by letter through sequential clip.
6. This system is a valuable for HI students who learn English language. Therefore to develop modified system which can process any desired language of teacher is a great challenge step forward supporting HI persons round the world.

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Sep.2008 till July.2012 : Assistant Professor – Department of Multimedia System – Faculty of Information Technology – Al-Isra University – Amman-Jordan

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There are 29 papers have been published or accepted for publishing in many several international journals (USA , U.K , Europe Union , Korea ,India and others) and conferences .

Books: (One Chapter)

Karim .Q Hussein , Learning-Oriented Technologies, Devices and Networks, Chapter 13: pages 259-273 Evaluating System for E-Learning Modules for Hearing Impaired Students (Technical Criteria in Review) .

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Research Interests and Teaching Subjects

Mainly e-learning particularly Multimedia and e-learning for handicapped persons (Deaf & Blind). Also 2D Animation (Director & Flash), 3D Animation using (MAYA), Instructional Computer Applications , Generic software and Authoring Systems , besides other computer science subjects (Visual Programming , OOP , Algorithms , Data Structures , Operation Research , Internet programming , System Software , Numerical Analysis Applications ,etc.)

Software Skills: Mainly Multimedia S/W interest : MAYA , Director , Flash , C++ , Java , Visual Basic , Premiere Pro, php , Dreamweaver , HTML, ASP.net ,etc.