Al Hasub Wa-Ta`allum Al Lugha Al `Arabiyya li-Ghayr Al-Mukhtasiin Biha Bi-Al Tariqa al Tawasulliya

LEARNING OF ARABIC LANGUAGE FOR NATIVE NON-SPECIALISTS:
A Module Of Research-Based Computerized Curriculum [1]

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ABSTRACT:

We discuss a research-based, computerized curriculum in Arabic. Learning of Arabic language for native non-specialists(ANNS) at the college level is presented as one module of this curriculum. Computer simulation of communicative and structural Arabic are intended to facilitate metacognitive learning or higher order thinking of Arabic language learning strategies.

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I. Introduction:

Educators and Linguists are concerned with the weakness of Arab students in their deployment of Arabic Language. This concern promoted educators (Barazangi et al., 1998) to re-think present educational curricula that rely on teaching grammatical structures of Arabic as the centre of language learning in all fields of instruction (Ibrahim, 1987).

This paper discusses the pedagogical framework of a research-based, computerized curricular design of Arabic as a communicative language and a subject matter. Teaching and learning Arabic language for native non-specialists (ANNS) at the college level is presented as one application of this framework, and as a prototype of its procedures. This prototype module is the second of three modules. The first module, "Arabic Self-Learning," was developed at Cornell University for non-native college learners. The third module is for native children.

The framework of this project is based on a collaborative research and curriculum development   which aims at utilizing an Arabic computerized knowledge base (Barazangi et al., 1998; Al-Bawab et al., 1994) for educational goals with learning of Arabic as an application. The curriculum design is based on a literature search and an empirical research using principles of Arabic language development, Arabic linguistics, language learning and acquisition in general, computing, and computers in education. Part of this research was conducted among native students at the Higher Institute of Applied Sciences and Technology (HIAST).

The module presented in this paper "Learning Of Arabic Language" is one of this project's products, and is designed for native non-specialists.
Instructors will be promoting learning and the use of problem-solving skills
in one subject area (Arabic). The module will consist of several packages. The outcome of learners' experience will be their intended, conscious integration of their procedural knowledge, declarative knowledge, problem-solving skills, systemic thinking, and the deployment of Arabic language skills. this experience is facilitated by language learning strategies.

II. Basic Principles of Research-Based Curriculum

The purpose of this research and computerized curriculum activities is to facilitate the acquisition of Arabic efficiently. Though efficiency may result in speed of learning, it is intended here to make learners aware of their own cognition(interaction of procedural and declarative knowledge) in the specific language-learning environment (interaction of the Arabic language system and its uses). Making metacognitive strategies explicit is assumed to help learners understand, and eventually eliminate or change their own "non-efficient" learning strategies. Making ANNS learners' metacognitive strategies explicit through computer simulation of Arabic is also assumed to aide researchers, computerized curriculum developers, instructors and learners of Arabic to moderate the discrepancies in the instruction and acquisition of ANNS. By shifting the focus from teaching grammar into the participatory learning process, the paradigm for ANNS and for language learning in general may shift. Participatory learning means that learners have a stake in identifying needs, devising meaning and form, and designing tasks as well as self-assessment constructs. Meanwhile, instructors, curricular developers, linguists, and computer specialists collaborate with the learners to facilitate learning of Arabic language interactively. Thus, the ANNS module prototype.

The ANNS module was developed at HIAST by a team of researchers and engineers, and is based on three intertwined aspects:

     A. The educational aspect.
     B. The linguistic aspect.
     C. The informatic aspect.

A. The educational aspect:

This aspect is based on the contemporary learning theory of conceptual change as outlined in Barazangi et al. (1998 and 1997). The goal of this theory and the research-based computerized curriculum is to facilitate interactive Arabic learning at the metacognitive level. Barazangi also relied on her empirical research that was conducted with learners of Arabic as a foreign language at Cornell University in 1994-1996, with learners of Arabic as native speakers at HIAST in 1995, and with Syrian children (2.5 - 4 years of age) who were tested in imitating certain structures of modern standard Arabic and Syrian Spoken Arabic (Lust and Barazangi, 1979).

The results of the first study were utilized in designing the framework of the entire project: Research-Based Computerized Curriculum. For instance, it became clear that prior language learning does influence the learning of new languages or linguistic concepts. The findings of the second study with the NNS were utilized in designing the ANNS Module. For instance, the native non-specialist students learning was actually restricted by their pre-conceptions of Arabic language structure being confused with the local dialect and the traditional teaching of Arabic language. A good example is their weakness in applying the concept of "al Bina' wa-al-ꜤIrab." In This paper, we are only able to present the technical steps that Rebdawi used to develop the ANNS module.

B. The linguistic aspect:

The observer of a lesson in an Arabic classroom may realize that the facts and concepts being exchanged in the classroom are of different nature. The teacher discusses syntactic, morphological and orthographic aspects depending on the questions, reflections and reactions of the students. The students may feel unable to justify the morpho-syntactic forms of the sentence that are being proposed. On the other hand discussions can be carried out in the classroom about the cultural content of the text. The teacher explains such cultural aspects and highlights some of them depending on the educational objectives. In order to simulate this realistic class process, the ANNS module is built in a way that stands far from the traditional schooltext structure.

The traditional approach is often based on the separation of the syntactical, morphological, orthographic and cultural aspects. Each of these themes are covered in a separate text, and is usually taught in a different course. Also, syntactical, morphological, and orthographic knowledge are usually presented to students in the traditional way by giving the rule succeeded by some application examples. This approach forces the student to rote learn the rule as it was presented in old ancestral books, without comprehending the deep structure behind the particular rule, nor the procedural concepts of the rule.

ANNS Module to the contrary, is designed in a way that simulate the inherent interaction between all the themes stated above, and is intended to give learner the ability to be the designer of the educational process. Our module permits learner to choose at any moment the desired theme, enables him or her to process step-by-step the relationships between concepts, and moving in-depth within the system. At this level, learner finds himself or herself modifying or changing his or her prior linguistic concepts after he or she had interacted directly with, and experienced the new concepts.

C. The informatic aspect:

In order to eliminate the traditional concept of the course, the software implementation of the syllabic module is designed based on the concept of the package. Each package consists of a text combined with four units built upon this text: syntax unit, morphology unit, orthography unit, and culture unit. The text within the four units is supported by multimedia techniques (video and sound).

The prototype is developed on Macintosh environment. The portability to other environments (i.e. IBM compatible) is guaranteed by the used software development tool. On the other hand, the prototype is designed with the perspective to be linked with the knowledge base cited above. This will give more flexibility in manipulating Arabic.

III. ARABIC KNOWLEDGE BASE

Basing the 'artificial' Arabic computer language on the characteristic features of 'natural' Arabic language (Barazangi et al., 1998; Al-Bawab et al., 1994; Al-Bawab and Al-Tayyan, 1996) gives the system a pedagogical credence for Arabic language consciously-enhanced self-learning. More importantly, the Arabic Knowledge Base (AKB) contains the fundamental facts and assertions necessary to solve a specific problem in the Arabic environment. The AKB may also serve as one of the theoretical functions for computer-based curriculum development. The primacy of Arabic functionality over grammatical structure in this knowledge base presents a fertile foundation for an interactive learning process that relies on the use of problem-solving strategies and reflective higher order analysis of these strategies, as suggested by Oxford (1992/93). We discuss the relationship of AKB to interactive multimedia, to morphological and syntactical processing system of Arabic, and to language teaching and learning through computers.

A. The Interactive Multimedia (IMM) and AKB:

Arabic Knowledge Base not only provides the declarative knowledge, but could be used as the organising principle. Combining the conceptual change theoretical rationale with the functionality approach to language learning, and psycholinguistic with pedagogical knowledge of Arabic has transformed our paradigm of computer-based curricular and instructional design. We call the combined scheme "Metacognitive learning" to indicate a reconciliation of the following three epistemological assumptions in addition to the assumptions underling the educational hypermedia, and language acquisition and learning. They are:

1. Computer is the medium of curricular design, and the learner is the centre of the curricular process.

2. Arabic computer language and the natural language (Arabic in this case) are integrated in the presentation of the concepts.

3. Language structure and other declarative knowledge are facilitators to procedural knowledge. Thus, the instructional module(s) constitute both the subject matter (grammar, syntax) of the declarative learning, as well as the target of the procedural language (the application of the rules to solve problems linguistically or conceptually).

Conceptual change theorists assume prior perceptions of concepts as determinant in the learning of new concept(s) (Barazangi, 1988). Thus, meaningful, effective learning requires reflective (metacognitive) process in one's own conception and practice of a practical concept. As new concepts and meanings are introduced, or made directly

accessible to the learners, learners reconstruct their own learning scheme and meanings, and create new activities and insights.

B. The Morphological and Syntactical Processing System of Arabic:

The morphological and syntactical processing system of Arabic -the Derivative, which generates and produces vocabulary, and the analytic which retrieves a root of a word along with its vocalisation and prefixes or suffixes- operate independently as well as interactively. Each part of the system guides the user through an elaborate multiple-box and multi-window sub-system, from defining the original letters of a root or entry in its different patterns and categories to specifying all grammatical and morphological forms and derivatives. This system is a part of the AKB under construction.

The AKB, therefore, provides the concepts in addition to applications for the user. For a learner-centered computerized curriculum, the accessibility of both the solutions and the principles that underlie them produces an integrated, comprehensive model of systemic thinking in Arabic. The long-range product of this project, the computerized curriculum and the instructional modules, should be understood in this new framework.

C. Language Teaching and Learning Through Computers:

Language teachers wanted to improve on language teaching labs and, thus, began the movement of adding computerized tutorial material to the audio-tutorial tapes known in the 1950s and 60s. With the aid of computers, they introduced written exercises to taped language conversation scenarios in the 1970s (Altman, 1989). Video tutorial was introduced in the early 1980s to present the cultural context of the target language (Gay, 1987). As new theories of language learning and acquisition were debated, several techniques and teaching strategies were under experimentation in classrooms (e.g., functional vs. structural). With the utility and accessibility of computers, and the invention of CD-ROM, computerized language instruction took a lead in combining all four representations (text, graphics, still and moving video images, and sound) into one integrated program. With the recent emphasis on learner-centered curriculum, the introduction of IMM, and the changes of language teaching and learning paradigm, computer-based language instruction became a computer-based interactive strategy for communicative and grammatical learning (Nunan, 1988).

IV. Technical Steps in Developing the ANNS Module

Developing computerized curricula requires systematic design irrespect of the content and/or the educational principles and goals. We designed the interactive learning of Arabic language for native, non specialists, as follows:

A. Selecting the intended concepts and facts.
B. Determining the educational method to relate these concepts electronically and interactively.
C. Selecting text and examples to deliver the concepts and facts.
D. Determining the most suitable computer programming environment for the educational objectives.
E. Developing the overall design and the interfaces.
F. Implementing the entire design.

A. Selecting the intended concepts and facts:

In Order to select the intended concepts and facts, we have to make a topic distribution strategy, to divide the syllabic material into four units (syntax, morphology, orthography, and culture), and to have an equilibrium between the topics that are bundled in one package. Our observations led us to the conclusion that some topics are very long and complex, such as inflection (al-ˤIraab) and indeclension (al-Binaa') and depiction (Rasm) al -Hamza Therefore, we adopted the principle that balances the level of complexity between the units. Consequently, when a topic to be treated in a unit is long and complex, we choose shorter and less complicated topics in the other units. This principle led us to build texts oriented toward the goal of the predominant unit. Some additional material are used to allow us to go into less complex topics. This choice permits us to avoid boring and artificial texts.

Accordingly, we decided to create predominantly syntax oriented text, inflection (al-ˤIraab) and indeclension (al-Binaa') as a dominant topic. In the morphology unit we chose active participle (Ism al -Faaˤil). In the orthography unit we chose imperfect noun (al-Ism al-Manqous) and in the culture unit we chose the cliché (Rawsam) and Arabization (al-Taˤreeb) concepts.

B. Determining the educational method:
As we mentioned before the module presented here is one of three modules that were derived from the Research-Based Computerized Curriculum (Barazangi et al., 1998). This module, hence, reflects the educational methodology of the curriculum that relies on interactive self-learning to achieve metacognition.

C. Selecting texts and examples:
We have composed a dialogue text in a manner to cover all the concepts and facts that were intended. The examples were designed to support such process. Some of the examples were derived from the text, and others were added as needed.

D. Determining the programming environment:
Since we adopted the interactive multimedia as a medium it became necessary that we use effective and user-friendly environment for designing, developing, and implementing the module. In addition, this environment allows the program to process users' input, to analyze it, and to give feedback. On the other hand we paid special attention in selecting the development environment to the portability factor that will allow the use of Macintosh or Windows.

E. Developing the overall design and interfaces:
The four units were based on the text. Each unit focuses on a particular concept through certain words. The interface was designed to achieve consistency. Each user interface has a space for text, another for interaction, and a third that consists of active buttons to move between units.

F. Implementing the design:
The design was implemented at HIAST using a Power Mac computer and an authoring system.

V. Moving Through the ANNS Module
A. The first interface consists of the first section of the text, combined with the related video (Figure 1). The Learner may view all the text sections in order to be

acquainted to classical Arabic pronunciation, and to understand the dialogue through listening.

B. The learner may choose one of the units, interacting in-depth with the particular topic in a manner that helps recognition of the concept. When the learner fails to understand the concept, he or she is encouraged to try again without giving him or her the rule nor the answer. At the third trial the program sends a help message, explaining the concept without giving the rule.

Assuming that the learner selected the syntax unit, the program starts by asking the learner to find in the text an interrogative particle (Harf Istifham) and an interrogative noun (Ism Istifham), then the program moves to the next step for the learner to distinguish between the concepts of inflection (al-ʿIraab) and indeclension (al-Binaa') , through the use of interrogative nouns. This step is achieved through examples consisting of interrogative nouns that has different syntactic function and nunation.

We assume that the learner has recognized by experience and observation the difference between two types of interrogative nouns. The concept is reinforced through a new screen presenting definition of the inflection and indeclension, distinguishing between inflected interrogative nouns and indeclented interrogative nouns.

The third step is parsing interrogative nouns. Here, the learner may select one of the interrogative nouns that are highlighted in the text. Once he or she makes a selection, a dialogue box appears on the screen consisting of the sentence that contains the selected noun. A comment appears under the sentence with all the syntactic information that have been previously acquired by the learner . At that time, the learner needs to write the inflection venue (Mahal al-ʿIraab) in an edit box (Figure 2).

If the learner is not able to fill the edit box with the appropriate information, he or she could click the help button. At this stage the learner could view simple cases related to the particular interrogative noun (Figure 3). These cases allow the learner to practice and fill the needed information. The program assists the learner in analyzing the particular sentence as he or she move forward, explaining how interrogative noun develops, and the rationale behind the expression "inflection venue" (Fi Mahal ʿIraab). The final step consists of special exercises.

The same educational principle is used within the other units. For example, in the culture unit, we present two concepts. The first concept is clichés (Rawasem) and the second is Arabization (al-Taʿreeb). Here, we explain only Arabization for the purpose of brevity.

This concept is presented through asking the learner to extract an Arabized word or expression from the text. As an example, by selecting the word "Telfaz", the dialogue box ques the learner about the root of the word. The learner may enter what he perceived as a root and the program responds that the root does not exist in the dictionary. The program, then, asks the learner to write the common name of the word. The next screen shows the origin of the word in English "Television", and how the Arabic Language Society of Cairo has decided its Arabization according to certain rules (AL-Shihabi, 1988) (Figure 4 &5).

VI. Implication and Conclusions

The implications of this project deals with developing human capital by improving the educational, linguistic, and language skills of learners at the higher education level within the Arabic computerized environment.

The module, presented as an application of the project, is the first step toward developing a comprehensive curriculum of Arabic learning for native non specialists. To

develop this curriculum we need to define its goals, the content, the vocabulary, and the text that facilitate the development of different educational packages and syllabic units.

On the other hand, interfacing this module with the Arabic Knowledge Base will facilitate for the learner the exploration of different Arabic language concepts through direct, interaction with the base. In addition, such future step may allow learners to develop higher order skills, including the deployment of the Arabic language.

Another future step is launching the module on the World Wide Web, allowing learners free interactive exercise and accessing other related cultural and scientific knowledge bases. Such free interaction may open the way to apply the entire curriculum within the Arabic environment to any other subject matter, not only to Arabic language.

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