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ON MINIMAL VALUABLE VERSION OF INTEGRATIVE COMPUTER-ASSISTED LANGUAGE LEARNING SYSTEM

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Abstract. The given work is devoted to analysis of modern integrative CALL systems. The problems have been discussed and a minimal valuable version of integrative system is provided. Main issues have been discussed and the methods of their resolutions have been provided.

Keywords: computer-assisted language learning, linguistic environment simulators, integrative system, scenario, frame.

МИНИМАЛЬНАЯ ВЕРСИЯ ИНТЕГРАТИВНОЙ ЛИНГВИСТИЧЕСКОЙ ОБУЧАЮЩЕЙ ИНФОРМАЦИОННОЙ СИСТЕМЫ

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Аннотация. Работа посвящена рассмотрению проблем современных интегративных лингвистических обучающих систем. Представлен вариант минимальной версии интегративной системы. Определены основные задачи, приведены методы решения данных задач.

Ключевые слова: симулятор лингвистической среды, лингвистическая интегративная обучающая система, сценарий, фрейм.

Actuality. According to Warschauer [1] there are three key classes of CALL systems connected to three language learning approaches: behavioristic, communicative, integrative [2;3]. These systems are not competitors, but rather three necessary units of the whole system effectively complemented each other.

Behavioristic systems are focused on using the computer as a tutor governing by the "drill and practice" principle. However, behavioristic systems did not allow enough authentic communication to be of much value [1]. In fact, the linguistic environment for language acquisition is very important. It presses the students to communicate with other people in real time mode, brings a lot of examples of how to say something, a lot of variations of how to express a thought, gives many opportunities to experiment with the language [4]. Communicative CALL systems involves the computer as stimulus, not as a tutor. The features of the communicative CALL systems are as follows: teaching grammar implicitly; encouraging students to generate original utterances rather than manipulate prefabricated language; avoiding to tell students they are wrong and being flexible to a variety of student responses; creating an environment in which using the target language feels natural.

Integrative systems are based on two technological components - multimedia computers and the Internet [1]. Multimedia resources can be used by the students on demand allowing to build an authentic linguistic environment able to affect the user through several channels of perception (listening is combined with seeing, like in the real world). The main features of such systems are as follows: authentic linguistic environment simulation, skills are easily integrated, because the media makes it natural to combine reading, writing, speaking and listening in a single activity; students studying in accordance with their individual plans, honing in on aspects and skipping the others; focusing on the content. The typical integrative system is Dustin program developed by the Institute for Learning Sciences at Northwestern University [5]. Dustin includes a number of video scenarios that all employees will encounter (airport, checking into a hotel, ordering food). User interacts with different persons from video-clips, posting his/her answers. If the answer is correct and trainee is successful with a scenario, he/she goes to the next one. But when the trainee is not successful, he/she gets notified by the system what they have to learn in a very direct way. The correction of the user answers is made using a tutor agent, which in communicative user-centric manner suggests a correct way to convey the message [6]. Another project based on the same principles is SPELL discussed in the works of Hazel Morton [7; 8]. The main features of the project are as follows: automatic speech recognition; embodied 3D virtual agents and virtual worlds for the creation of scenarios; focused on developing oral skills in the target language.

Task definition. Despite of the human forces and financial expenses spent to realize the projects no one can say that the goal is achieved and such systems can be effectively used by the wide range of learners. They seemed quite useful for beginners, or maybe they could be used for training people in the specific areas. But the beginners level is rather simple and the difficulties come when the learner tries to enter the real world inhabited by the people who use the language unconsciously. It is not easy to break the barriers connected not only to hearing and speaking, reading and writing, but also to thinking and perception. By the way, most of the learners prefer watching videos with subtitles and listening audios from podcast to working with CALL systems.

Thus, the key questions of the given work are as follows: how to make integrative CALL system more effective and useful; and what is the minimal valuable version of such system.

Main part. To answer the first question, we should understand the reasons of the limitations. The system composed of three main units: student shell allowed users to find and run the scenarios; teacher's shell allowed teachers to make new scenarios; infrastructure made by designers and other professionals to support the scenarios' creating and maintaining. The term 'scenario' is used in the meaning of frame-oriented scenario proposed by Minsky in [9]. R. Schank used term 'script' to denote this concept [10]. Generally, it is a structured representation describing a stereotyped sequence of events. Obviously, the number and the complexity of scenarios depends on how easy a teacher can add new scenario to the system or change an existed one, i.e. it depends on the level of system's viscosity. The viscosity is one of the cognitive dimensions [11]. A viscous system needs many user actions to accomplish one goal [12]. To answer the question of how to make the resistance of the system to change lower, we should completely understand what the scenario is, its conceptual view and its components.

Firstly, we should understand the foundation of the scenario-oriented system. In general, the scenario of the linguistic environment simulator is composed of scenes reflecting a real-life situation. But here we have a question of what are the situations the simulator should be oriented to. It's very important question because the further development depends on the answer. First variant of the answer is the variant provided by the developers of Dustin and SPELL. They think of a situation as a direct real-life situation like checking into a hotel or ordering food. But everyone understands that it is not easy to build an environment able to represent such situation: recording the video, building 3D infrastructure etc. Another variant is to use indirect reflection of the situation where the scenario reflects a discussion about the situation. This variant seemed to be not so expensive to realize and maintain. I.e. we suggest using the event of talk about the

shopping or visiting party instead of event of shopping or visiting party. Of course, we could use supplementary material like photos or pictures to build more realistic environment, but we suggest to minimize the environment. It looks like someone tells a story showing photos taken by mobile phone. The system becomes oriented on discussion about the situation instead of the situation. It makes the system less expensive, more flexible and effective. As a result, we will have a huge number of different scenarios designed for different groups of users and an infrastructure allowed the users to find and compare the scenarios, helped them in creating their individual plans of learning.

Each scene of scenario consists of a sequence of steps. The scene looks like a videotape composed of frames. Each step is directed to pass a message to the end-user. The messages can be divided into two parts: context-oriented and task-oriented. Context-oriented messages form a background to make a natural step-by-step involvement of the user into "user - system" communication. The communication is based on tasks generated by task-oriented messages. Undoubtedly, the tasks role is extremely important, because the system should have a necessary feedback from the user to understand their weak points and make their learning more effective. But the tasks do not mean a set of simple matching tests with only one right answer. The tasks should help users to improve their skills. This claim gets the developers faced the issue of a huge number of probable variants of acceptable answers connected to one task, considering their completeness, acceptability etc. It is obvious that this problem cannot be resolved simply by the enumeration of all the available variants. Thus, there should be applied a usable mechanism of patterns able to help teachers to describe a huge number of variants using compact structures like frames.

How the user can understand the messages? The easiest way is to provide a translation. But it is very expensive and it is far from the main goal of such systems that is to simulate a linguistic environment. Another variant of solution is to limit a number of words per each message and provide an image/photo, a brief explanation in the target language with some references and examples that can be used to catch the meaning. It helps us to involve the student to experiments with the target language.

How the messages can be adopted to the user? Every message has its minimal meaningful form. Thus, we can show the user a process of evolution of the message from its minimal form to the completed one. It is more effective than the repetition of the whole phrase without understanding its structure and variations it encompasses. The mechanism of compact description could also be used to represent a process of evolution of the context-messages from its minimal meaningful form to the complete one.

In our opinion, the whole way of passing the scenario is divided into 4 parts. First, zero-phase prepares user for the interaction. User plays the scenario without any communication, listens to the audio and watching the pictures and subtitles. He/she can stop the scenario and ask system for explanations on a selected message. Second phase is dedicated to involve the user step-by-step into communication. Slow audio context-messages accompanied with subtitles and photo interrupted by the task-message and a request to input an answer on the question "What has he/she just said?". The user should be able to pass the meaning of the phrase without any leverages (text/audio) in a time while defined by the system to complete the task. Notably, it is not a task to repeat the phrase, but to pass its meaning in the target language. Another variant of the question is "Tell me briefly, what does he mean?". And if you memorize the phrase told by 'him' without understanding its meaning it would not work. The next phase is dedicated to polishing listening skills – subtitles become switched off, audio is still slow and the tasks become harder to execute. Is the tasks set being the same for both phases? Partly the tasks are the same as in the previous phase, but the previous answers are recorded by the system, and when the user tries to propose a variant he already used, system may ask user to say it differently. The last phase dedicated to the reality. Here the audio runs in real mode, some noises can be added to simulate the real environment, time limit to answer gets shortened and the user gets under pressure of real-life environment conditions. Of course, the user is free to choose the phase, but the scenario is passed if the user has passed the scenario in the real mode.

Conclusions. The minimal valuable version of integrative system is provided and the specific points have been discussed. The system should be based on discussion-oriented scenario paradigm. It makes the system flexible and maintainable, scenarios can be easily added and updated. An effective infrastructure should be built over the scenarios. This infrastructure should allow users to find and compare the scenarios, help to create their individual plan of learning. The main attention should be drawn to the problem of considering a huge number of acceptable answers connected to one task, providing a method of their compact description, construction tasks management unit which can be effectively used by the teachers. The mechanism of compact description could also be used to represent a process of evolution of the context-messages from its minimal meaningful form to the complete one. The provided scenario-oriented method of language learning is divided into 4 phases: preparation for interaction, communication based on slow audio with subtitles, communication based on slow audio, real time communication.

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ВИВЧЕННЯ «ОСНОВ ГЕОІНФОРМАЦІЙНИХ СИСТЕМ ТА ТЕХНОЛОГІЙ»

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Анотація. У статті розглядується питання організації вивчення "Основи геоінформаційних систем та технологій" майбутніми фахівцями аграрного профілю. Студентам потрібно засвоювати велику кількість понять. Науково-методичні підходи щодо організації навчального контенту дозволяють ефективно засвоїти навчальний матеріал.

Ключові слова: геоінформаційні системи та технології, навчальний процес, навчальний контент.