

Choice of Appropriate Multimedia Technology and Teaching Methods for Different Culture Groups

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Abstract This paper describes the prerequisites for development in the area of cross-cultural multimedia didactics. This approach is based on research studies of differences between mentalities, ways of working with educational information, culturally-specific teaching methods and teaching techniques that determine differentiated approaches to the choice of multimedia technologies in education system.

Keywords Cross-cultural Multimedia Didactics, Education Frames, Culture Specific Teaching Methods, Multimedia Technology

1. Introductory Part

Nowadays, a new educational paradigm is being created. It encompasses features of multiculturalism and multi functionality, where project work complements scientific research. Educational processes tend to incorporate online learning methods. Multicultural education 'space', however, reveals issues like cognitive-pragmatic differences between representatives of various cultures, incompetency of tutors alongside with inefficiency of unified teaching methods. From this perspective, cross-cultural multimedia didactics requires further research with a focus on differences between cultural mentalities, presentation of educational material, culture-specific teaching methods and teaching techniques that determine differentiated approaches to the choice of effective multimedia technologies in education system.

Meanwhile, the problem in differences between cultures and people's mentality is becoming more and more real. Trying to eliminate this gap, some developed countries improve cross-cultural communication skills with the help of social networks and special e-learning environments, which actually makes the process of adaptation in another culture easier.

The main purpose of this paper is to give analyses of the methods of using individual learning paths in other cultural groups, and to give some predictions and recommendations

in the conclusion. Also, in the proposal some related literature which concerns this topic is going to be analyzed. Then, the results will be given in the conclusion.

2. Research Studies on Differences in Structure of Intellect in Various Cultures

Existing approaches to culture specific mentalities and cognitive performance are worth looking at from a perspective of intercultural educational communication. Sociocultural approach considers intellect to be a result of socialization process, a product of specific education and combination of various types of information processed. A.R. Luriya [10] suggested that culture influences intellectual preferences; moreover, it contributes to creation of a specific personal cognitive profile that affects ways the information is presented, including educational materials in text format.

Also, according to D. Matsumoto[11], most Western cultures define intellect as thoughtfulness, precision, maximum accuracy, whereas eastern cultures tend to define intellect as ability to follow established algorithms and patterns. Additionally, according to Matsumoto, representatives of various cultures may apply different strategies to information processing. For instance, citizens of North America may consider a list of solutions; each of these would be tested hypothetically and the most suitable one would be chosen. Thus, a more rational approach is preferred. Per contra, in homogeneous cultures with a high degree of uncertainty avoidance, there is a tendency for making decisions representable, i.e. ideas need to be supported with drafts and graphic illustrations. Matsumoto also claims that people from different cultures choose certain strategies and use them in different ways. Therefore, decision making processes vary depending on the culture, i.e. in individualistic culture people tend to use own resources when searching for information, whereas, collectivist cultures tend to involve others into decision making process. Also, people from collectivist cultures tend to follow traditional cognitive patterns, ways of thinking and acting

even more so if these patterns are used by people of higher social status and well respected people. According to researches of M.A. Holodnaya[5], speed of information processing is non-uniform. There are two types of thinking – slower rate of decision making (reflective cognitive style that is more typical for the Eastern cultures) and faster rate of decision making (impulsive cognitive style that is more typical for the Western cultures). This approach may be used from the perspective of studying features of an individual, as well as cognitive activity of a nation. It is evident that cognitive style reflects ways of perception, analysis, structuring and categorizing of the world, a learning style. According to Holodnaya, cognitive style is a way of establishing perceptive contact with the world. Most western cultures have ‘high cognitive complexity’ which is a multidimensional model of the real world encompassing multitude of connections. Eastern cultures are characterized by ‘low cognitive complexity’ which represents clear-cut, simplified interpretation of reality. In Eastern cultures intellect structure features human morals component: verbal reasoning, developed perception of language, increased sensitivity and contentment with approximate solutions. In Western cultures intellect structure is characterized by pragmatic components such as visual, active and practical thinking, ability to quickly tackle formalized issues, tendency for order, analytico-synthetic activity of thinking, developed ability for memorization and logical reconstruction. N.M. Lebedeva[8] claims that the phenomena of creativity can’t be defined the same way for different types of culture. In Western individualistic cultures that represent western cognitive tradition, creativity is a process of creating new things, whereas in Eastern collective oriented cultures creativity is defined as improvement of what is already in place. In individualistic cultures creative approach to problem solving is welcome more than in collectivist cultures.

Thus, we observe that cultural aspects influence intellectual activity.

3. Features of Framing Information in Different Cultures, Teaching Methods and Teaching Techniques

As information processing occurs, students form own semiotic frames. Moreover, we can assume that in one or more cultures, frames may be different. In didactics frame is defined as a recurrent way of educational material organization (frame as a concept) and teaching time (frame as a scenario) when dealing with educational information. In this connection, the frame-based approach reflects the national features of the approach to the study, the organization of knowledge and the problem solving methods. In various cultures this approach is not unified, same applies to virtual education domain.

In her research, B.L. Leaver [9] described some aspects of the relationship between cultural environment, didactic and

cognitive features. The author differentiated Western approach from non-Western approach to study. The Western approach is characterized by such features as the dominant verbal auditory and visual style, deductive, analytical way of thinking, impetuosity (information processing is fast paced and is often accompanied by frequent change of activity and team work); assessment is conducted in the form of tests, there’s a focus on differences, on contrast and individualized approach. On the other hand, the Eastern approach is characterized by dominance in auditory and kinesthetic styles, dependence on the context, tendency for searching similar features, for viewing situation as a whole and using intuitive perception. Also, figurative and narrative ways of expressing thoughts, as well as continuous focus on a single thought are typical for the eastern approach.

Knowledge of culture specific features will undoubtedly help improve education process. However, it’s necessary to mention the scale of growth of the integration processes that one way or another will be shown as a part of transformation of cognitive features, i.e. in polycultural education tradition learning frames will develop and acquire new semantic overtones.

Choice of effective teaching methods will be determined by culture specific cognitive and educational activity. When dealing with polycultural audience the following aspects are worth considering: content selection (culture codes, semiotic context); culture specific way or structuring learning activities (models acceptable in a culture); system of assessment (providing incentives for an individual as well as for a group).

Receptive and reproductive teaching methods based on paternalistic view of the world will dominate in collectivist cultures, whereas individualistic cultures predominantly use heuristic and problem-solving methods.

Thus, the practice of linear and non-linear education methods presents particular interest. The linear methods are predominantly used in Eastern cultures, and nonlinear methods are typical for Western cultures. It should be noted that in the e-learning educational environment these features remain. In our opinion, dominant culture frames determine the choice of methods. Speaking of the linear method, it is necessary to admit that it is a linear sequenced data of presentation and a strong hierarchy. But the nonlinear approach is often unpredictable with hypermedia and interactive presentation of content. Also, as mentioned above, the different educational cultures are dominated by different paradigms of information processing. For example, Western cultures have extensively been using interactive education that helped increase cognitive flexibility. In most Eastern cultures education methods are aimed at revisiting the existing context. Thus, we can see that Eastern cultures predominantly use structured or formal learning, whereas Western cultures prefer flexible, adaptive ways of working with educational information. It is also necessary to take into account both the specifics of the information processing and technological aspect of education process (attitude towards

innovative educational methods in a given culture).

4. Cross-cultural Multimedia Didactics is a New Direction of Online Pedagogy

Educational process set within multicultural e-learning environment, methods and forms of its organization will be the subject of cross-cultural multimedia didactics. Ethnometric approach by G. Hofstede [7] has been applied to the description of subject at hand. In this context the following important parameters have been selected:

- A. Consideration of psychological and pedagogical features of the educational process in a cross-cultural context.

This section deals with a variety of problems which are stemming from objectives and values of national educational systems, educational paradigms, national specific forms of educational communication, types of educational discourses, etc.

For example, if a student belongs to a culture with a low power distance rating than that of a teacher, he would expect from a teacher a more informal way of communication involving exchange of opinions, discussion of mistakes made, which may appear somewhat alien to the teacher. Consequently, the exchange of the relevant information and instructions between a teacher and a student would not take place, which actually will have a negative effect on the future process of study. Representatives of the cultures with a high level of uncertainty avoidance frequently try to avoid ambiguous situations. Ambiguity and change are frowned upon. Structured and routine, even bureaucratic approach to problem solving is preferred. Interactive education in cultures with a high power distance rating requires monitoring of the learning process. On the contrary, in cultures with a low power distance rating interactive education often thrives. Indeed, members of the team from a culture with high index of individualism are inspired by competition, ability to express own opinions and make own decisions. On the contrary, members of collectivist cultures require quiet environment and quality hardware for group interaction. Experiments conducted revealed that in Western cultures it is acceptable to discuss the mistakes in order to avoid them in future and learn from them, ask questions, argue the points of view, etc. On the contrary, in Eastern cultures the ability to discuss mistakes is limited due to high importance of maintaining harmonious relationship within the group and fear of failure.

- B. Culturally conditioned features of ergonomic design of electronic manuals and media; National features of educational content organization.

Clearly, in this context, the importance of psychological and didactic basis for the organization of cognitive activity in a multicultural learning environment cannot be underestimated, neither can be academic support. Thus, cognitive and contextual components may really influence

the specific forms and genres of electronic books (i.e. different visual perception of the function keys, difference in ways information is sorted, in presentation of data formats and iconic characters), as well as their structure, content and interface. Electronic learning systems featuring interactive learning, variety, creativity (training scenarios, training simulation environment, integrated learning environments) may successfully be used in Western cultures, and, more likely, with less enthusiasm in the East.

In order to create an effective educational resource aimed at multicultural audiences, it is necessary to consider such components as: a navigation system, cultural competence, easy access to logically presented information, appropriate design, the degree of user involvement, the use (specifics) of various multimedia materials, strategies of educational process, user and motivational support. 'Cultural marker' is a design feature that belongs to a particular culture, i.e. colour, national symbol, space layout etc. Members of different cultures pay attention to different things. For example, for cultures with a high power distance such parameters as index resource structure, hierarchy, information security, officiality in e-learning environment are of high importance. It has been noted that users from different cultural backgrounds behave differently when using educational resources organized by the method of open content: members of cultures with a high index of individualism prefer unique content, and they are more active in using the resources of this kind, they often refill the existing content or change it. Per contra, the representatives of cultures with a high index of collectivism often relay existing content rather than create a new one.

Thus, we observe influence of national educational paradigm on structure of intellect and specific preferences in processing of educational material. Once these factors are taken into consideration, the choice of effective methods of learning within multicultural educational environment is a simple task indeed.

- C. Interconnection of cognitive characteristics, choice of optimal teaching methods and the preferable types of multimedia technology.

In our opinion, there is a certain pattern of interconnection between the type of culture, educational objectives of a culture, specific techniques and teaching methods, motivational and pragmatic characteristics and preferable type of multimedia technologies for the members of this cultural group and, finally, effective ergonomic parameters (Table 1). We'll compare countries belonging to different cultural groups. The design of on-line resources certainly embodies national culture of its creators. User web interface must meet the cultural and pragmatic expectations of the user (especially in navigation, graphics and content) for maximum efficiency of presenting information. For example, it is possible to observe that the design of European sites is characterized by ease of navigation, logic and predictability, dosage of information and no hidden content.

Table 1. Interconnection between cognitive characteristics, choice of optimal teaching methods and preferable types of multimedia technology

<p>The U.S. Mono active type of culture, dominance of individualism, low power distance rating, low uncertainty avoidance, low context culture</p>	<p>Educational paradigm: Variation, a focus on personal development, innovation and creativity. The aims of education: building a complete picture of the world, providing solutions to problems in wide array of uncertain situations, personal development. The use of problem-solving methods. Creative problem solving, tendency to set super-objectives objectives, innovation.</p> <p>Preferred multimedia technology: symbolic objects, graphic objects, video objects (animation, dynamic models of phenomena and processes, videos); "virtual reality" environment (simulators, designers, trainers, interactive models, virtual laboratories, electronic engineers, electronic educational games).</p> <p>Ergonomic features of educational materials: small blocks of information, comfortable navigation, option of online interaction with the tutor and ability to edit content at own discretion; availability of numerous different educational applications, links to groups in social networks and a large amount of video content, along with content in text format.</p>
<p>CHINA Culture with a high index of collectivism, high power distance rating, high reactive culture of power and high degree of uncertainty avoidance, high context culture</p>	<p>Educational paradigm - maximum conformity to rules and norms (Confucian education model). The aims of education: safety, conformity, adaptation to typical situations, the world as a set of patterns. Linear methods, reproductive, strict adherence to the instructions and training guidelines.</p> <p>Preferred type of media technology: shaped objects, video objects (animation, dynamic models of phenomena), "virtual reality" environment, electronic expert coaching systems, electronic educational games, electronic books, electronic lectures, electronic collections</p> <p>Ergonomic features of educational materials: vertical and horizontal menu, very bright colors, overload from links and information blocks. The interface is designed in such a way that access to information is often very difficult; one may notice high level hierarchy in the way information is organized and presence of special social roles to control access to it. Lots of slide shows and hieroglyphics.</p>
<p>GERMANY Mono active type of culture, rational way of thinking, average index of individualism, high uncertainty avoidance and high power distance, low-context culture</p>	<p>Educational paradigm – in the middle between unitary and variable paradigms. The aims of education: - balance between conformity and formation of a system view of the world that is able to provide solutions to problems in a wide range of uncertain situations, personal self-development</p> <p>Preferred type of media technology: symbolic objects (signs, symbols, text, graphics, charts, tables, formulas etc), graphic objects (photos, drawings, paintings), electronic expert systems, electronic study books, electronic books.</p> <p>Ergonomic features of educational materials: horizontal menu consisting of information blocks, rather succinct, easy navigation, logical order and predictability, controlled information, absence of hidden content</p>

Training for tutors working with polycultural audience remains one of the main issues of cross-cultural multimedia didactics. As pointed out by E.A. Andreyeva[1], tutoring is a part of cultural phenomenon. There are different national models of tutoring, but for the most part they aim at supporting students in the process of their development of individual learning paths. In Russia and Germany both individual and team work are used.

In the Middle East, introduction of individual tuition may face some obstacles. At present choice of tutoring models (trajectory) is basically driven by national cultural model, and, since the objectives of educational process depend on the culture these objectives are different as well. Tutors from different cultures respond differently to behavior of students and pay attention to different problems. For example, Chinese tutors tend to link student's behavior to a particular context or situation, whereas Americans link it to the student's personal qualities.

According to the research of Atabekova[2] on the analysis of linguistic design of WEB-pages, the communication failures may be caused by mismatching between the practical aims of the author and those of the recipient, by difference in scope and content of their vocabulary, as well as different conceptual elements in their linguistic view of the world. As a result, studies have shown that non-native speakers who work with web pages in English may experience a few

difficulties identifying the nature of the information. These may include: difficulties identifying the content of the relevant pieces of information due to ambiguity of certain lexemes; difficulties caused by context dependent pragmalinguistic connotations, difficulties isolating ethnocultural information, difficulties identifying socio-cultural component in information area. Therefore, conceptualization of the content of each unit of the information related to non-linguistic reality in the hyperlink requires using language in such a way as to create conditions for successful communication. According to the author, this is possible provided that potential differences in linguistic and conceptual thesaurus, as well as differences in elements of linguistic view of the world have been addressed.

Additionally, one of the primary issues in cross-cultural educational environment is a problem of quality and appropriateness of the feedback (timely responses, degree of clarity of the goals and objectives set by tutors), which for the most part depends on the cultural context.

For the most rapid adaptation of tutors it would be appropriate to develop a cultural assimilator, aimed at adapting to the multicultural education in a virtual environment. This assimilator should be developed in the following segments:

1. Situations aimed at forming psycho-pedagogical and didactic competence in cross-cultural context;

2. Expertise in culture specific ergonomic design of electronic textbooks and media;
3. Thorough knowledge of culture specific educational content and types of pedagogical discourse.

5. Methods and Techniques of a Student's Interactive Didactic Support in an On-Line Education Process. Possibilities for Establishing a Culture-Specific Education Path

We find it of great interest to consider the existing methods of adapting educational content and interface to the personal and cultural traits of a student by means of semantic technologies. There are a number of researches into this sphere Gonçalves, V[14], [15]. Among the results of these studies, we can point out a culture-identifying system CAWAS, which allows adapting multimedia on-line education content to a student's culture through intellectual agents [3]. This system is supposed to possess "cultural intellect", i.e. be capable of providing various interfaces and methods of representing the educational materials depending on the cultural specifics of a student. The system is supposed to interpret a student's behaviour and, after identifying their culture group, to "suggest" them a suitable educational program and interface. This is the task of an agent responsible for interpretation, which receives information from the data base on the types of thinking processes and activities of different cultures. Therefore, the culture data base contains two types of information: static cultural data and dynamic cultural data. Then the information is passed to the agent responsible for selecting an education program. Also, the interpretation agent requires from the culture selecting agent about a student's culture type and then passes this information to the agent modeling the culture type. The latter agent generates new culture clusters which are stored in the "dynamic culture" module. Next, the educational program selecting agent sends the data (emotive and motivational parameters with relation to cultural identity) to agents responsible for culture modeling and culture adaptation for planning the educational path, selecting the educational content, schedule, methods etc. The adaptation agent takes the final decision on supporting or rejecting this course. The agent constantly updates its data base which allows better adaptation to students' culture types. The agent creates a student's "cultural profile", regularly updating it, and thus enhancing the general data base. This whole process allows adapting multimedia content to the culture specifics of a certain student. Thus, the cultural and cognitive personal traits, identified when a student enters the program, will determine the specifics of educational activities, information processing, as well as methodology, feedback and assignments. We believe that the problems arising in distance education can be overcome by employing cross-cultural awareness of the participants of the

educational process and, consequently, by synchronizing their activities. In fact, taking into account student's cultural and cognitive traits and the nature of their educational activities will allow meeting a student's expectations and will contribute significantly to the efficiency of the educational process.

6. Conclusion

It's common knowledge that today's education is becoming more open and easily accessible; consequently, it is not limited by the boundaries of countries and regions. Moreover, on-line communication allows the educational processes to transpire irrespective of the territorial boundaries: not only the number of students is growing, but also their cultural identities are becoming more diverse. Nowadays educators are facing new problems caused by different world views, specific types of educational discourse, various information processing strategies etc.

As a part of cross-cultural multimedia didactics, the following subject may present particular interest:

1. Methods and techniques of interactive didactic support of students studying independently in a virtual learning environment, considering social-cultural discourse and motivational features;
2. Social pragmatic aspect in the design of the structure, content and interface of electronic manuals and online learning environments (knowledge structure, content and media preferences, presentation preferences);
3. Appropriate selection of teaching methods including cognitive and discursive differentiation.

Cross-cultural multimedia didactics may be viewed as a combination of cultural, psychological and pedagogical aspects, of culture specific pedagogical discourse, unique features of ergonomic design of educational resources, cognitive and pragmatic features and specific methods and forms of teaching and, therefore, is set to become one of the most important trends in contemporary education system.

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