

The Integration of Cultural Diversity into Knowledge Management and eLearning Systems

Edith Denman-Maier

(Donau-Universität Krems, Austria
emaier@donau-uni.ac.at)

Abstract: This paper is based on on-going research carried out in the framework of an EU project aimed at enhancing knowledge management (KM) in enterprises. It deals with the impact of (inter)cultural factors on the accessibility and presentation of eLearning content. Once the empirical research is completed and the data analysed, guidelines will be proposed for developing Web-based training modules for culturally heterogeneous user groups sharing the same professional background. Special consideration will be given to contextual and community features.

Key Words: user interface design, usage-centered design, knowledge management, Web-based training, interaction patterns, cross-cultural / intercultural factors.

Categories: H.5.2, J.4

1 Background of Research and Organisational Context

This paper reports on on-going research carried out at the site of the French industrial partner in the framework of a transnational European project co-funded by the European Commission under the Information Society Technologies Programme. The project will end in October 2003.

The aim of the project concerns the creation of customised Web-based training (WBT) courses for a major manufacturer of helicopters, who boasts a culturally highly diverse range of customers. Training is normally included in the sales contract and precedes delivery of the aircraft. Although all trainees are expected to be proficient in English and share the same professional context, it may be posited that their varied cultural values, traditions and attitudes have an influence on their understanding of the content and their cognitive approach to its presentation.¹

Generally speaking, apart from cultural background, factors such as age, experience, profession (e.g. pilots vs. technicians), rank and gender tend to play an important role in classroom behaviour. In this study, however, gender is a negligible factor, given the extremely small number of women involved in helicopter training.

At present, the customisation of training to user requirements is accomplished exclusively by the individual instructors. Since the eLearning components are not expected to replace face-to-face instruction but only supplement it, the "burden" of adaptation falls and will continue to fall on the instructors. Based on their experience,

¹ This also applies to the instructors, who are of French mother tongue, but are expected to teach courses in English.

didactic skills and/or intuition, they adapt the courses to the requirements, level of experience and prior knowledge as well as to the cultural expectations and traditions of the trainees, especially as far as the interaction between teacher and students is concerned.

The present study is primarily concerned with the theoretical underpinning for the analysis of the impact of intercultural factors on the transfer of knowledge. It also reports on the interviews carried out in the autumn of 2002 with key figures involved in and/or affected by course development, i.e. instructors, course authors and designers, sub-contractors such as interpreters, and trainees. These interviews formed part of a contextual and requirements analysis for the installation of a KM system in preparation for the design of WBT modules. The interviews have been complemented by the observation of a varied series of courses and reflect the experience and explicit as well as tacit knowledge of the instructors when adapting the training to the requirements of specific target groups.

At the time of writing (April 2003) a pilot WBT module is close to completion and preparations for testing its usability are under way. The actual testing will be conducted in May and June 2003 and first results should be available in time for the I-Know Workshop in July.

2 The Objectives of the Project

A major challenge faced by the helicopter manufacturer is the need to recognise and integrate the different requirements and expectations of its culturally diverse customer base into its training activities. Increased customer demand and cost savings are the main motivating factors behind its eLearning initiative. The company intends to set up a learning management system for its clients world-wide so as to reduce the time pilots and technicians have to spend on-site in order to learn about and familiarise themselves with new equipment.

At an early stage in the project the partners realised that intercultural factors would have to be taken into account at all levels (user requirements, development and design, implementation and evaluation) for the application to succeed. If on-site training is supplemented by eLearning components, cultural adaptation and adaptability, respectively, will have to be integrated into the design of the modules.

Although for the time being no localisation or customisation for specific target groups is anticipated, the modules nevertheless have to be designed in a way that future customisation will be possible without any major redesign if it should turn out in the user tests that this would be desirable so as to increase the acceptance by and satisfaction of certain user groups. Besides, it would be useful for the company to have guidelines about how to produce and test customised modules for different target groups. Guidance on these issues can be found in international standards, software manuals and a host of publications and articles (see below).

3 Intercultural Factors

3.1 Intercultural Factors in the Field of Usability

Issues such as internationalisation and localisation are mostly dealt with in the literature on human computer interaction (HCI) and software engineering. More recently, efforts have been made to apply the methods and guidelines developed in these fields to the usability of Web sites [see, for example, Alexander and Tate 1999; Spyridakis 2000]. However, hardly any research has been done on international and/or intercultural aspects concerning Web-based training modules. The current research intends to fill this lacuna.

Overall, we can observe an increasing awareness that developing truly effective interfaces for an international audience requires more than just translating text and involves a cultural transfer [see, for example, del Galdo and Nielsen 1996; Luong, Lok, Lok and Driscoll 1995; Russo and Boor 1993].

The above-mentioned authors tend to agree that interface elements affected by culture, such as colour, images, symbols, must be adjusted for cultural differences; that number, date and time formats have to be converted and text flow and layout designed around locale-specific user modules. There is a consensus that social norms determine the acceptability of images, symbols or icons in a culture, and that therefore great care must be taken when using images, symbols or icons depicting religious symbols (e.g. crosses, crescents, stars), the human body, women and hand gestures.

Functionality, too, can be affected by cultural factors. Certain features, e.g. for encouraging interaction, might be taken for granted in one society, but be met with disapproval in another. One example cited in the literature refers to a poetry teaching tool developed for use in France. It was designed in such a way to accept the teacher's comments but not those of students. This was acceptable in France, but not well received in Scandinavia, where students are encouraged to contribute and interact with teachers [Russo and Boor 1993].

Whereas many software products and international Web sites are translated into various languages and their design customised to address the needs of users in other countries and language communities, catering for a culturally heterogeneous user group as is the case with this application requires a different approach. Rather than selecting the user groups on the basis of cultural background and customising the eLearning system to suit their specific needs, the design has to integrate cultural diversity, i.e. be culture-neutral.

A similar case has been described in a study conducted by Bourges-Waldegg and Scrivener. Like the trainees of the French project partner, their users had a good command of English, but nevertheless misunderstandings occurred when users were asked to evaluate two English Web sites aimed at an international audience [Bourges-Waldegg and Scrivener 2000]. Among other findings, their study emphasised the importance of using unambiguous, concise as well as simplified English rather than the type of idiomatic, jargon-rich language usually cherished by Web site designers.

In contrast to the user samples described by Bourges-Waldegg and Scrivener, the future users of the WBT modules share the same professional context. Regardless of their country of origin or cultural background they have a great deal of experience of either helicopter flying or maintenance. It is therefore to be expected that the meaning

of terms, symbols and images which relate to their professional context will not pose difficulties.

The areas where problems can arise and where cultural factors will have an impact on the usability and thus acceptance of the application are those in which interaction and community features play a role, both of which are highly relevant in an eLearning context.

The crucial question addressed by the research is whether it is possible to design Web-based training modules for a culturally heterogeneous, but professionally homogeneous user group in such a way that they can be understood and are acceptable without further customisation or localisation. A corollary to this question is to the extent to which particular requirements are truly culture-specific or genre-specific, i.e., for example, whether in the case of pilots - as opposed to technicians - professional cohesion tends to override cultural influences.

This type of user sample is actually far from rare and can be encountered in many international settings such as multinational companies, consultancy firms, banks or non-governmental organisations which operate or have subsidiaries world-wide.

3.2 Intercultural Issues in Learning and Teaching

Most authors regard cross-cultural learning situations as fundamentally problematic. Geert Hofstede, one of the most prolific and most frequently cited authors in the field of intercultural studies, identifies four main problem areas [Hofstede 1986]:

1. differences in the social positions of teachers and students
2. differences in the relevance of the training content,
3. differences in cognitive ability profile between the populations from which teacher and student are drawn and
4. differences in expected patterns of teacher-student interaction

In the current investigation, points 1 and 4 are relevant and as far as Web-based training is concerned, it is the last “problem area”, i.e. differences in mutual role expectations between teacher and student, that plays a particularly important role. This addresses the training process and thus issues of interaction rather than the content of training, which – given the shared professional background of the trainees – should prove to be relatively unproblematic.

There is no doubt that Hofstede’s work has a sound empirical base and is based on practical experience, but his concept of culture as essence and difference has limited explanatory value for this research. In the writings of Hofstede and those of his followers, culture tends to be intrinsically linked to language, nationality and ethnicity, notions which in the globalised or rather globalising world of international computer networks do not play the kind of role which was accorded to them by anthropologists in the nineteenth and twentieth centuries. Rather than regard cultural factors as sets of purely externalised phenomena, the current research focuses on culture as an organisational resource. Furthermore, this study is based in a work environment where managers are more concerned about managing cross-cultural interactions than managing cross-cultural differences.

4 Theoretical Concepts and Methodology

The concept of cultural dimensions (Individualism vs. Collectivism, large vs small Power Distance, strong vs. weak Uncertainty Avoidance and Masculinity vs. Femininity) as propagated by Hofstede and his followers can provide useful signposts for observing student behaviour in the classroom but is likely to prove inadequate to account for the complex web of interactions and, above all, for the issues related to the development of eLearning modules. Rather than promote awareness about the influence of cultural factors in general, it seems important to identify cultural standards and/or requirements which apply to a concrete application or product.

Activity Theory, a conceptual approach that provides a broad framework for describing the structure, development and context of computer-supported activities, can serve as the underlying approach and furnish the concepts, models and methodological tools for identifying the influence of cultural factors. Activity Theory is a set of basic principles that constitute a general conceptual system, rather than a highly predictive theory.

There is a thriving Activity Theory tradition in HCI studies in Scandinavia and increasing interest in Activity Theory and HCI in other European countries, the U.S., Canada and Australia, as well as continuing work in Russia where it originated [Nardi 1996].

Demographic data on the trainees such as country of origin, age, professional background (pilots, mechanics, avionic specialists) and level of experience will be collected by means of a student profiling tool which has to be completed by trainees before attending a course. This tool has been developed as part of the project in order to assess the trainees' level of know-how and thus enable the course organisers to form more homogenous groups, which in turn will make the instructor's life easier.

Contextual analysis including learning and teaching requirements as well as interaction behaviour in the classroom relies heavily on participant observation and interviews.

As far as the usability testing of WBT modules is concerned, systematic reviews follow guidelines termed "heuristic evaluation" [see Nielsen 1994] and carried out by experts will precede and complement user-focused testing. The users involved will represent a fair cross-section of the company's culturally diverse customer base. The general usability tests are expected to uncover critical incidents which might be due to cultural factors, esp. with regard to contextual and functional elements. The user tests will be followed by focus group discussions to enrich and possibly clarify the data obtained from the tests.

5 Preliminary findings

5.1 General observations

The interviews carried out so far by the author have shown that instructors are very aware of cultural differences. They tend to distinguish between Asians, Anglosaxons, Other Europeans, students of "Latin mentality" (e.g. the French, Spaniards, Mexicans) and Arabs. As far as the latter are concerned, they tend to differentiate between North Africans, Saudi Arabians and other Arab countries. Germans seem to be regarded as a category apart which might be due to the fact that some time ago the French company

merged with a German helicopter producer, and therefore have the dual role of partners and clients.

Instructors are on the whole not only aware of but also take a positive attitude to cultural differences seeing them as a source of enrichment rather than as barriers to be overcome. In the more in-depth interviews, in particular, it became clear that their constant exposure to people of different cultural origin has led to a very sophisticated and differentiated view. Whilst on the one hand they recognise certain cultural patterns, habits or attitudes, they also stress that one should be wary of stereotyping.

Respect for each other is seen as the key to a good climate in the classroom and as conducive to efficient training. This can include familiarising themselves with the history and culture of the trainees' countries of origin to providing halal food for Muslim clients. Interpreter(s) at times contribute to the understanding of cultural attitudes or behaviour patterns and some instructors quite consciously "use" interpreters as a source of cultural knowledge. They can also help them distinguish between behaviour which is rooted in cultural background as opposed to the idiosyncracies of an individual student.

5.2 Intercultural issues in teaching and learning

A first investigation of student behaviour on-site showed that two main approaches could be discerned:

1. Trainees who frequently ask questions, engage in dialogue with the instructor and other students and do not hesitate to pass comment.
2. Trainees who tend to keep quiet and rarely interact with the instructor or other students and hesitate to be openly critical. They tend to assimilate new topics/know-how through systematic, step-by-step individual learning.

The instructors adapt to the different expectations and behaviour patterns by adapting the actual didactic methods. In the first case an interactive, problem- and task-oriented approach is called for and the instructors tend to act more as coaches, recognising the students as peers and experts. In the second case they make an effort – through close observation of trainees' non-verbal behaviour – to gauge the degree of comprehension and respond accordingly, e.g. by resorting to a more hands-on, "touch & feel" approach.

Any critical incidents so far observed in the classroom were dealt with successfully by the instructors. In an eLearning environment, however, different expectations and behaviour patterns of trainees cannot be met by an experienced instructor who is able to adapt his didactic approach and compensate for certain lacunae or deficiencies in the presentation of the training materials.

Ideally, this kind of empirical study should be conducted over several years and in several countries. If time and money permit, the current research will be extended to include the training approach practised in the training centre of the German partner for comparative purposes.

References

- [Alexander and Tate 1999] Alexander, J.E., Tate, M.A.: "Evaluating Web resources"; <http://www2.widener.edu/Wolfgram-Memorial-Library/webeval.htm> (1999).
- [Bourges-Waldegg. and Scrivener 2000] Bourges-Waldegg, P., Scrivener, S.A.R.: "Applying and Testing an Approach to Design for Culturally Diverse Groups"; *Interacting with Computers*, 13 (2000), 111-126.
- [Del Galdo and Nielsen 1996] Del Galdo, M., Nielsen, J. (Eds.): "International User Interfaces"; Wiley, New York (1996).
- [Hofstede 1986] Hofstede, Geert: "Cultural Differences in Teaching and Learning"; *International Journal of Intercultural Relations*, 10 (1986), 301-320.
- [Holden 2002] Holden, Nigel: "Cross-Cultural Management – A Knowledge Management Perspective"; Prentice Hall, Harlow, 2002.
- [Luong, Lok, Lok, & Driscoll 1995] Luong, T., Lok, J., Lok, S., & Driscoll: "Internationalization: Developing Software for Global Markets"; Wiley, New York, (1995).
- [Nardi 1996] Nardi, B. (Ed.): "Context and Consciousness: Activity Theory and Human-Computer Interaction"; MIT Press, Cambridge, MA, 1996.
- [Nielsen 1994] Nielsen, J.: "Guerilla HCI: "Using Discount Usability Engineering to Penetrate the Intimidation Barrier"; http://www.useit.com/papers/guerrilla_hci.html (1994).
- [Russo & Boor 1993] Russo, P. & Boor, S: "How Fluent is Your Interface? Designing for International Users"; *Proceedings of INTERCHI '93*, ACM, New York (1993), 342-347.
- [Spyridakis 2000] Spyridakis, Jan: "Guidelines for Authoring Comprehensible Web Pages and Evaluating Their Success"; *Technical Communication*, special issue (3rd quarter 2000).