Accommodating Cultural Diversity through Educational Software Design

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ABSTRACT

The Internet has afforded designers of educational software a broad range of opportunities to span both temporal and spatial learning boundaries. New technologies allow learners from widely different cultures to participate in virtual learning environments and have resulted in a plethora of new offerings for 'distance learning'. However, despite these technological advances, it is contended in this paper that educational material designed for distance learning as opposed to local use has failed to reflect any fundamental change in the approach to its design. In general, educational courseware designed for use by global communities represents adaptations to existing material rather than a fundamentally new approach. It is our view that the design of educational software intended for use in a global environment needs to incorporate, from the outset of the design process, a new approach. We must, for example, acknowledge and accommodate for the potentially different cultural backgrounds of the learners. To illustrate this view an example is given of designing a business game, the purpose of which is to introduce participants to basic management skills. The intended audience for the game is multi-cultural.

Keywords: culture, business game, internet, distance learning

1. INTRODUCTION

The Internet affords new opportunities and challenges for designers of educational software. One such challenge results from the fact that users of the software will be drawn from diverse cultural backgrounds. These cultural differences impact on a number of issues that may influence the way in which a learner engages with the educational software as well as the learning process itself. 'The provision of knowledge, the expectations of its recipients and the implementation of new techniques all have significant cultural dimensions' (Pollard 2001:83). Cultural diversity amongst learners requires designers of educational software intended for multi-cultural audiences to consider the impact of culture on, inter alia, the content of the knowledge, the criteria for evaluation and the process of acquiring knowledge and skills. Traditional design has provided for a 'local culture' reflecting the needs of individuals within a relatively homogenous culture. The opportunity for global learning requires the extension of the provision of a 'local culture' to that of an 'operational culture' reflecting a broad range of diverse cultural objectives, perceptions and practice. In this paper we highlight the need for educational designers to take into account cultural differences early in the design process and consider the effect of cultural differences on learning behaviors and outcomes. In particular, we are interested in those behaviors that are relevant to playing educational business games and more specifically computerized business game simulations where a real-world business problem or scenario is simulated. The effect of these differences on the design of this type of business game is discussed.

2. COMPUTERISED BUSINESS GAME SIMULATIONS

Computerized business game simulations have been in use since the late 1950's. Since that date we have seen an exponential rise in the number and type of simulations available. The educational intention underlying these games is that the lessons learned through participation reflect reality and may be taken as a measure of the participants' ability to manage in a

real world environment (Keys and Biggs 1990). In particular, there has been a widespread increase in the availability of computerised business games in which participants assume the role of decision-makers within organisations. The form which these games take is generally that of an exercise where a number of cycles of business or trading are 'simulated' on line and where a complex, evolving problem or crisis exists which learners are required to bring to a logical conclusion. The goal of the exercise is for the learners to discover the optimum values to be allocated to the selected variables according to a computer 'model'. In order to provide a valid pedagogic tool, the design of this model must provide a realistic representation of real world scenarios. The simulation is, thus, of necessity complex, frequently covering a broad range of subject areas, such as marketing, accounting, planning etc. all within a single application.

3. CULTURE AND COMPUTERISED BUSINESS GAME SIMULATIONS

The aim of computerized business game simulations is to introduce learners to a number of core business skills. Amongst, the most pertinent of these skills is the ability to formulate strategy, make decisions, communicate effectively and solve problems. Acquisition and demonstration of these skills is influenced by the learner's cultural environment. It is, therefore, our contention that any educational game that is intended for global use should address the question of 'cultural sensitivity'. 'Cultural sensitivity' should not be viewed as synonymous with 'cultural neutrality', but rather that designers should strive to provide an 'operational culture'. By operational culture is meant a culture in which the individual may interact at a given point in time or in a given situation according to a set of standards, shared by the group, which determine what is important, what is feasible, what to do and how to go about doing it (Goodenough 1971).

If an 'operational culture' is to be created then it is necessary for designers to consider the potential impact which culture may have on the learners participating in the game and adjust the design parameters accordingly. In the following discussion we consider the importance of cultural sensitivity in designing a business game. Cultural awareness will effect the vocabulary to be used, the selection of the content of the game, the decisions to be made and the problems to be addressed. It will also impact on the criteria which are selected to determine the outcomes of the game, as well as the process for the successful achievement of these criteria.

4. SELECTING THE VOCABULARY FOR THE GAME

Language represents and expresses the culture and value system behind it. Business games designed for multi cultural learners need to take account of the effect of language differences amongst the learners as well as the tendency of different cultures to use the same words to express different meanings. Sapir points out that no two languages are ever sufficiently similar to be considered as representing the same social reality. The worlds in which different societies live are different worlds, not the same world with different labels attached (Sapir 1929). Jankowicz describes a study conducted in the context of the problems involved in teaching western management theories and practices to Polish managers. Using French terminology he makes a distinction between langue (language as translated) and parole (language as experienced in a given culture). If this distinction is not recognized misunderstanding is likely to occur (Jankowicz 1994).

The simulation designer needs to be aware that words used in the design of a game may not convey the same reality for all participants. For example, in Western cultures the response 'no' to a question, signifies that one does not agree with a statement or proposition, whilst the Japanese are reluctant to give a negative reply and would prefer to remain non-committal rather than say 'no'. They think that intelligent human beings should be able to discover the point of a discourse from the context.

Clear definition of words is particularly important in distance learning applications where participants usually cannot see each other and hence cannot enhance the verbal message with the additional meaning conveyed by non-verbal communication such as gesticulation, body movement, eye contact etc. Designers should therefore pay strict attention to the choice of words and make use of techniques such as back-translation. This technique involves the translator translating from the source language into a target language, then another translator who is not familiar with the source-language text, translating the first translator's translation back into the source language and a comparison made between the two versions of the source language.

One suggested solution to this problem is to provide a game which may be played in multiple languages. In MAGNUS, a simulation game used to support a course in decision technology, text information and messages for players have been separated into a language area so that the game can be played in multiple languages (Yeo & Tan 1999).

5. SELECTING THE CONTENT OF THE GAME

In designing a business game simulation both the subject matter which the simulation is to address and the pedagogic objectives must be clearly defined from the outset. It is these elements that set the stage for the learner's experience and lay the theoretical base so that the learner can view the experience in the desired context (Gentry 1990). In the following section we address some of the more pertinent questions that may be addressed in order to provide content that reflects cultural sensitivities.

5.1 Which products are to be traded?

One of the most distinguishing factors of a game is the type of product which the game portrays (Keys 1990). Learners from diverse cultural backgrounds will have different perceptions and values associated with various products that will influence both their business strategies as well as their pricing policies. Selection of the product to be traded in the game is culturally sensitive. There is no evidence that common tastes for goods exist across cultures (Wind 1986). In selecting the product for the game questions need to be asked as to how it relates to the cultural life-style of the participants. For example, a bicycle may be viewed as a vital means of transport in one culture and as a leisure item in another. Food stuffs are highly culture bound and previous research suggests that high-technology products such as computer hardware and heavy equipment are appropriate for global strategies, whereas clothing or household cleaners are less so (Peterson, Blyth, Cato Associates Inc and Cheskin Masten 1985).

Keys compares the ways in which this problem has been addressed in various simulations and suggests that designers should differentiate between "general and real-world products" (Keys 1999). Examples cited are 'The Business Management Laboratory' (Jensen 1996) which trades dinnerware and pottery and 'The Business Policy Game' (Cotter 1995) where the product traded is a 'generic' consumer-durable good.

The type of product selected, will influence the participants pricing strategy. Pricing plays a crucial role in business simulations. It is frequently the mechanism used to achieve maximum company profit, gain market share, increase cash flows or increase the unit volume of sales. However, once again, pricing strategies are influenced by cultural factors. Usunier draws attention to variation in pricing between Northern and Southern European countries (Usunier 1993). Prices tend to be high in Northern Europe where high price is correlated with product durability. He suggests that a possible explanation for this is that these countries are Lutheran by religion and thus favor austerity to limit consumption. By contrast, Southern European countries tend to be Catholic where the Church has never been concerned with the price and quality of material possessions and does not consider spending as shameful. Durability of products is less important as a result of climatic conditions that allow for more of an outdoor life.

5.2 Which financial reporting and accounting methods are appropriate?

All business games will require an element of financial reporting and accounting. However, accounting systems are societal constructs and it is widely recognised that financial reporting on a global basis is fraught with difficulties - even two economies as similar as the USA and the UK have regulatory and legal differences that cause comparability to be eroded.

An interesting example of how potential problems may arise from differences in reporting financial information is provided by the business game A IV Network$ (1995). In this game the gross receipts and payments for subsidiaries are written off to the profit and loss account in the period when the transaction occurs. This may well be standard accounting practice in France or Japan but in the UK it is prohibited as an accounting treatment. The UK/US approach shows the acquisition of a subsidiary by increasing assets in the balance sheet. When disposed of the balance sheet reduces with net gains or losses being written off to the Profit and Loss in the period of sale. The net effect of this is that an $8 million purchase under a UK/US system would have no Profit and Loss effects until the point of sale but in the business game A IV Network$ it reduces that period's profit by $8 million.

There are a number of games that have been designed to overcome some of the difficulties arising from diverse accounting practices. For example, for

example, the Multinational Management Game provides varying international interest rates for the companies simulated (Keys 1997). Some of the more complex games use a tax rate that varies across world markets, for example, The Business Management Laboratory (Jensen 1996).

5.3 Which problems need to be resolved?

Business games include a problem or number of problems that need to be resolved. In selecting pertinent problems and appropriate approaches to solving them, it is once again necessary to consider cultural differences in problem solving. Galtung distinguishes between actual reality and potential reality in problem solving and contrasts the intellectual styles of four different cultural groups, namely, the 'Gallic', 'the Teutonic', the 'Saxonic' and the 'Nipponic'. He found that Saxons will look for facts as evidence in problem solving, which results in factual accuracy but weaknesses in both theory formation and paradigm awareness. Teutonic and Gallic styles, on the other hand, place emphasis on theoretical arguments, using facts principally to illustrate what is said. However, the Nippon style is heavily influenced by Hinduism, Taosim and Buddhism and views knowledge as being a temporary state, they dislike clear statements which have a ring of immodesty about them (Galtung 1981).

Differences in approaches to problem solving are well illustrated in a study by Hofstede (1980). Students of various nationalities were given a case study to analyse and solve. The case outlined a conflict situation between the sales department and product development departments within an organization. French students suggested that the solution should be solved in a hierarchical setting, a solution being sought from the chairperson. The Germans felt that the lack of formal rules and written procedures was to blame whereas the English felt that the problem was the result of lack of communication.

Determining an appropriate level of spending on marketing is a problem that commonly needs to be addressed in business simulation games and may be a determinant of the final 'outcome' of the game. Yet, cultural differences have a major impact on determining marketing spend. An example of a simulation which has attempted to address this problem is the Multinational Management Game (Keys 1997). This game takes into account the fact that the same amount of dollars spent on advertising in North America has a greater impact than they do in Europe. These differences are represented by a computer algorithm which calculates the differences and the results are used to complement the international briefings.

5.4 Which decisions need to be made?

Participants in the business game are required to make decisions at various stages in order to bring an evolving problem or crisis to a logical conclusion. In determining which decisions need to be made and when, the designer once again needs to consider how cultural differences may effect the decision-making process. Differences exist, for example, between the Japanese and the Western styles of decision making. The Japanese reach decisions by group consensus whilst Western cultures tend to have hierarchical structures where decisions are made at the apex of the hierarchy (Laser et al., 1985). The typical sequence of decision-making in Western culture may be depicted as a stepwise process involving:

> intelligence gathering
> design of possible solutions
> choice from the list of possible solutions
> review of the implementation of the choice (Simon 1970)

This type of action/decision process is, however, viewed mainly as an implementation issue by the Japanese. They view the first step in decision making as that of consulting a broad range of individuals at various levels , who will provide input on how to do something and not necessarily on why to do it (Usunier 1993).

In order to eliminate some of the decisional bias that may arise in designing multi cultural simulations consideration may be given to the following (Lee 1966)

> Define the problem or the objectives according to the customs, behavioral standards and ways of thinking of the various participants' culture;
>
> Define the problem or the objectives according to the behavioral standards and ways of thinking of the culture where the decision will be implemented;
>
> Isolate the influence of the culture on the problem and identify the extent to which it complicates the decision-making process;

> Redefine the problem and the objectives without the bias related to the culture and then find the solutions and make decisions which fit within the cultural context.

An example of decisions which frequently need to be made in business games are those associated with human resources. Keys noted the following decision categories associated with human resource management which may be included within a game:

> acquisition of human resources;
> development of human resources;
> rewarding of human resources and
> maintenance of human resources (Keys 1990)

In making decisions as to which human resources are required to achieve the objectives of the game, players are likely to be required to hire different categories of workers. Once again, we consider cultural factors to be highly influential in what decisions are taken. Labour legislation and practices as well as systems of reward and conditions of employment will differ markedly from country to country. Wage rates will vary with minimum wage rates likely to be far higher in developed countries. In some cultures anti-discrimination policies associated with employment conditions, such as those based on age or sex, may be highly pervasive whereas on others they may not exist at all. Health and safety issues also vary widely. In developing countries legislation on health and safety is far less rigid than in developed countries. Further, relationships with trade-unions vary between cultures.

5.5 Which criteria will determine success?

Business games are frequently designed in such a way as to arrive at a 'winner' or 'winning team'. The appropriateness of having this as the objective of the game requires examination when the attitudes of different cultures with respect to their view of 'winning' are taken into consideration as well as the way in which participants formulate their strategies for winning. Cultural background will effect the participants' perception of the acceptability of displays of power and aggressive behavior in order to achieve a 'winning' outcome. Graham states that power relations will determine who adopts and who adapts behavior in a cross-cultural setting (Graham 1981). Care must be taken, therefore, to provide a setting that provides equal opportunities for establishing power for all participants. This begs the question and requires the definition of what this setting is and taking into account the objectives, practices, motivations and beliefs of multi-cultural participants.

6. CONCLUSION

Whilst technological advances provide a wide range of opportunities for educational software designers, care must be taken that such opportunities reflect a fundamental change in approach and not merely a re-packaging of existing educational paper-based media. This paper has reflected on the need for an increased awareness of the different cultural backgrounds of the participants in a distributed business game simulation and the potential effects of such differences on the way in which learners perceive and interact with learning material.

Attention has been drawn to the need for designers to recognise that learners may speak various languages and hence the importance of the careful selection of the vocabulary to be used. Many business games are designed by native English speakers who may regard English as a 'universal' language. This is clearly not the case, the same words used in different societies do not necessarily convey the same social reality. The problem of language differences may be addressed in a number of ways. These include, to design a lingua franca based on one or some of the existing languages; to select a language such as English but then carefully choosing the vocabulary to be used or to provide learners with the choice of a wide range of languages such as has been done in MAGNUS (Yeo & Tan 1999).

International differences in financial reporting and accounting practices should also be taken into consideration. Games should allow for financial strategies which include a wide variety of global options such as by allowing lines of bank credit with varying interest rates in different countries or including currency exchange rates which may be easily changed by menu.

In order to address the problem of the impact of cultural influences on decision making, one solution may be to issue a number of behavioral or qualitative incidents which are culturally sensitive with choices for each decision round. These incidents may be delivered through 'news reports'. Such an approach has been used in the Multinational Management Game (Keys 1997) where a number of incidents have been included in the instructor's manual. These incidents require the team to analyze the effect of an event on

the local environment.

In selecting the criteria for determining success in the simulation, designers need to consider a range of potentially suitable outcomes. Games which encourage co-operative rather competitive choices may be considered, such as those based on the principles of the Prisoner's Dilemma where successful outcome rests on collective rather then competitive choices. Greater emphasis could also be placed on non-profit measures of performance. A multivariate approach to performance measurement may be used whereby successful negotiation of events that take place within the simulation may be rewarded.

We have illustrated our view with examples drawn from the design of computerized business game simulations. However, it is suggested, that these issues of cultural sensitivity apply to a far wider range of educational material and should be considered in the design of all educational software intended for multi-cultural audiences. Greater emphasis needs to be placed on providing an 'operational culture' in which the cultural needs of all learners are recognized.

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