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Principles and Practices Applicable to the Design of Successful Blended Language Learning

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Abstract

Blended Learning is rapidly becoming more widespread. Though reports indicate it is generally effective, there are still many improvements to be made, especially for Blended Language Learning (BLL). Several researchers have identified criteria that can be applied to the design of such learning in order to assure the best outcome. In this paper, it is suggested that we need to refer to three main fields in order to find the most suitable and applicable criteria: HCI (Human Computer Interaction), SLA (Second Language Acquisition) and general principles derived from practice. The paper elucidates in more detail what the criteria are and demonstrates briefly how they can be applied. As Levy (2002) indicates, it is necessary to make the connection between theory and practice in a way that is usable by those involved in the design process. This paper is part of an attempt to fulfill that requirement.

1. Introduction

'Blended learning' (BL) is a term widely used in the field of e-learning. It can be defined as the combination of e-learning (EL) and face-to-face (F2F) classes to deliver an educational program. Simply put, it is the blending of traditional classroom work with technology, in particular computers and associated technologies. More recently the term Blended Language Learning (BLL) has been coined to distinguish one particular area within BL, that which focuses on the particular requirements language learning brings to this kind of pedagogy.

BLL has been shown to be successful in a variety of ways and contexts (e.g. Crompton, 1999; Felix, 2001; Ayres, 2002; Allum, 2002; Cholewka, 2002; Harker & Koutsantoni, 2005; Hong & Samimy, 2012, Hu, 2012). In the UK the government has funded a five year project to establish BL at a center for Excellence in Teaching and Learning at the University of Hertfordshire. In the US many universities expect to expand their BL courses (Arabasz, P & Baker, 2003). However, there is still very little course material from publishers designed from the base up as BL or BLL material. Given the claimed effectiveness, this is surprising. As a result, examples of such courses are often those in which CALL materials have been adapted from classroom materials (e.g. Crompton, 1999) or made to support or supplement existing print materials designed originally for use in F2F teaching (e.g. Allum, 2002, 2003, 2005) or self-created by an individual or institution (Hu, 2012). They may also be web sites that are no more than collections of related electronic and other materials (e.g. Adair-Hauck et al, 1999), or web sites developed to enhance textbooks (e.g. most major EFL publishers), which are still primarily designed as F2F materials.

It is time to capitalize on the proven effectiveness of BLL. However, as Stracke (2007) points out, there is a need to more clearly conceptualize the very amorphous field that the term BL encompasses. Levy (1997) made the same point ten years earlier as reflected in the subtitle of his seminal book in the field '*Computer-Assisted Language Learning, Context and Conceptualization*' (1997), and repeated the point again in Levy (2002). This lack of conceptualization is partly a result of the very wide range of technologies that are subsumed in the word 'electronic' as in e-learning or the word 'computer' as in 'computer assisted language learning'. For example, within these terms may be encompassed computer-mediated communication – which itself entails e-mail, blogs, bulletin-boards, chat software, asynchronous and synchronous communication systems etc. - virtual realities, MOOs, interactive online exercises, guided websites, wiki's and even mobile phone technology. All of these and more can be included as the technological element of BL. It has even been suggested by Stracke (2007) that the term should include any

technology, for example VCRs and tape recorders.

How, then, can designers of curricula and materials who wish to take maximum advantage of this powerful learning paradigm (BLL) approach the task? The proposition developed in this paper is that, given the complexity of the field, alluded to in the previous paragraph, there is a need to clearly identify sound principles and express them in a form that can be easily applied to the design process of BLL. This is in line with arguments for such an approach made by Levy (2002), Chapelle (2001) and Neumeier (2005) and the work here may be considered an extension to or further working out of their ideas as well as a synthesis and summary of work carried out by the writer. That more needs to be done in this area is evidenced by Neumeier (2005) who at the beginning of her own effort to elucidate and apply appropriate principles says 'Up to now, the development of BL materials and complex BL environments was primarily *practice-led* as opposed to research based.'

The applicable principles may need to be drawn from several areas of expertise. Levy (1997) suggested the following fields might be relevant: Human Computer Interaction (HCI), Artificial Intelligence (AI), Computational Linguistics, Applied Linguistics, Instructional Technology and Design, and Psychology. However, while the fields proposed by Levy are relevant, it is proposed in this paper that a more limited and more relevant selection of expert knowledge can provide both a more practical and more closely focused set of design criteria. The fields suggested are SLA (second language acquisition) (e.g. Brown, 2000), in particular SLA theory applied to CALL (computer assisted language learning) (e.g. Chapelle, 2001), HCI (human computer interaction) (e.g. Hemard, 2003, 2004), and general principles derived from practice (e.g. Crompton, 1999; Terhune & Shawback, 2001; Allum, 2003, Hughes et al, 2004, Neumeier, 2005, Stracke, 2007). In this paper, I look at each of these in turn with the aim of providing a broad framework for successful design of blended language learning materials.

2. The Use of Principles from SLA Theory

2. 1. General SLA Principles

It is reasonable to argue that the first step in designing BLL should be the principles that are considered important in the language learning process. The application of theory to the teaching process has been suggested as the single most important variable in comparative studies of effectiveness of classroom and CALL software (Clark, 1985c). It is only in so far as technology can implement these in a learning situation that we can expect good results. Chapelle (1997, 1998a, 2001) and Jamieson, Chapelle and Preiss (2005) specify what criteria from SLA could be applied to the design of CALL materials.

The criteria (Chapelle, 2001) are formulated in two ways. In order to evaluate the potential of a CALL program from an SLA perspective, Chapelle cites five important factors and suggests they be applied by asking a series of questions about the program. This is described by her as 'judgmental' evaluation. The criteria and associated questions are as follows.

Language Learning Potential: Do task conditions present sufficient opportunity for focus on form?

Learner Fit: Is the difficulty level of the targeted linguistic forms appropriate for the learners to increase their language ability? Is the task appropriate for learners with the characteristics of the intended learners?

Meaning Focus: Is learner's attention directed primarily toward the meaning of the language?

Authenticity: Is there a strong correspondence between the CALL task and the second language tasks of interest to learners outside the classroom?

Impact: Will learners learn more about the target language and about strategies for language learning through the use of the task?

The second way, 'empirical' evaluation, is to formulate these criteria as questions about the outcome: for example, 'Did students focus on form?' She suggests that applying these criteria in both ways will ensure CALL-ware that is pedagogically sound in so far as it will be in line with SLA theory.

A related list of evaluation criteria is offered in Chapelle, (1998a). These are expressed as the 'needs' of the learner. They are as follows: the linguistic characteristics of language input need to be made salient; learners need help in comprehending semantic and syntactic aspects of linguistic input; learners need to have opportunities to produce target language output; learners need to notice errors in their output; learners need to correct errors in their output; learners need to engage in target language interaction whose structure can be modified for negotiation of meaning; learners should engage in L2 tasks designed to maximize opportunities for good interaction.

More detailed explication can be found in Allum (2003b) from which this summary of Chapelle's work is taken, while application in practice to a pure online course, not BLL, can be found in Jamieson et al. (2005), and to a BLL course in Allum (2003a, 2003b).

2. 2. Specific SLA Principles

While these criteria form a useful check list in the overall design process, there is a further need to apply more specific principles that depend on the particular aspect of

language learning taking place. For example, if the focus is on listening, then principles applicable to that skill should be applied (cf. Allum, 2003a, 2003b). In the case of vocabulary learning, the theories expounded by researchers such as Nation (2001) and Laufer & Hulstijn (2001) should provide refinement to the design process.

For example, Nation (2001) suggests that three stages are necessary for thorough acquisition of new vocabulary: noticing, retrieval and generative use. The first is more or less self-explanatory. He points out that noticing involves decontextualisation, taking the word out of its background context. He further suggests that effective ways to encourage this might be, among others, giving a definition or an L1 translation. Retrieval strengthens the memorizing of a word. Receptive retrieval involves perceiving the form and retrieving the meaning while productive retrieval means having the meaning and retrieving the form. Generative use involves not just simple retrieval but production or perception of the word in a different grammatical form, in a new context, or with new meaning.

Laufer & Hulstijn (2001) propose that degree of 'task involvement' strongly influences learning. This is constituted of three elements: need, search and evaluation. The strength of each of these contributes to the overall strength of task involvement. Need for a vocabulary item is moderate if the task demands it but strong if the learner feels the need for it. Search 'does not exist if form and meaning appear together, is moderate if learners have to search for the meaning of the item and strong if learners have to search for the form to express the meaning.' Evaluation 'involves deciding if a word choice is appropriate or not. Evaluation is moderate if the context is provided and is strong if the learner has to create a context.'

More detailed reference to these factors can be found in Allum, 2004, from which this summary of applicable principles is taken. A further principle that can be applied is one taken from general principles of memorization but applied to vocabulary learning within second language acquisition, that of 'spaced learning'. (cf. Nakata, 2008).

2. 3. Summary of SLA Factors

In sum, there is a need for designers of BLL to have a clear theoretical background and a set of principles derived from that background in a form that allows them to be relatively easily applied in the design process. The principles suggested above are all derived from SLA or learning theory. While Chapelle (2001) suggested these principles as applicable to CALL as opposed to BLL, it can probably be said without fear of contradiction that these are principles that should be applied to any language learning task design and thus they are necessary for the design of BLL materials.

3. The Use of HCI Principles

3. 1. HCI Definitions and Concepts

While the application of SLA derived principles is the most appropriate starting point for the design of any language learning material, BLL and otherwise, the incorporation of principles specifically developed for the design of Human Computer Interaction will ensure that the interface between man and machine is both pleasant and successful. As Shneiderman (1987) indicates, a good interface allows effortless interaction and gives the user the sense that he or she is completely in control in a predictable, understandable and comfortable environment. The concern, then, is not only with what the program does, though this is, of course vital, but with what it looks like and how it communicates with the user. Norman (in Norma & Draper,1986) describes two potential problems for users with the terms 'gulf of execution' and 'gulf of evaluation'. The first refers to difficulty the user may have while trying to map his intentions onto the interface while the latter refers to difficulty the user may have in understanding what the program has done, how it has or will respond to his actions, or what state it is in. The greater these 'gulfs' the more the effort that goes into communicating with the prorgram and the less the resources for learning.

3. 2. HCI Models

In principle, the designer should have three models in mind when creating an instructional (or any other) interface: the user model, the designer model and the implementer model. The first term has two meanings: first, it refers to the model the designer expects the user to form of the system; secondly, it refers to a model of who the user is. The designer model is that which the designer creates – deciding on what components will be available to the user, how they will operate and what relationships will exist. Equally importantly, the instructional designer has to decide what functionality will be needed to achieve the pedagogic goal. This last is more technical and typically will be implemented by a programmer, even though it needs to be specified by the instructional designer. This is the model of how the computer will actually achieve the tasks performed by the user. As teacher-designers we are mostly concerned with the first two. However, given the typical limits on resources, it is most likely that the degree to which we can alter either of these two models will be severely limited by the software we use. What is important is to understand both models, and within the limits just mentioned, to minimize any discomfort or confusion that may result from either.

Most modern interfaces use a metaphor, the most common being the desktop. The advantages of metaphors are that they allow the rapid application of existing knowledge

to a new domain. However, the designer needs to be aware that the advantages bring a danger, extension of the metaphor beyond its intended limit. For example, most users easily understand the icon of a waste bin and instinctively drag files here to delete them. But it is not at all intuitive to use the same icon to eject a storage medium which contains valuable data, and a naïve user would hesitate to drag the icon to the bin. Thus designers should think clearly through the model they create.

In addition, it is vital that designers understand what Cooper (1995) calls the 'idiomatic paradigm'. This refers to the 'language' created by mouse use – different types of clicks – in combination with the context in which it occurs.

3. 3. The Interface Design Process

The typical processes of design are as follows (Redmond-Pyle, 1995): define users, analyze user tasks, define requirements, define usability requirements, model user objects, adopt and apply style guidelines, prototype, analyze tasks, evaluate, modify, evaluate. The details of each of these steps are clearly explicated in Allum (2001). The first six have the aim of clearly identifying and enumerating the important parameters to be taken into consideration. For example, the design for a mandatory user might be quite different from that for a discretionary one, the tasks in a reading exercise might be very different from those in a VR world, the usability requirements for an aged person would be different than those of a university student, user objects that are effective metaphors in one country might not work so well in another, and variations of style within one group of exercises would be likely to lead to discomfort or confusion. The next two are the core of the design process. It should be pointed out that the 'task' here is not used in the pedagogic sense – for example 'do a discriminatory exercise to differentiate between two grammatical forms' but rather as the operations the user has to perform in order to do the exercise. For example, such an exercise could either requite the task of 'typing an answer in a blank' or 'choosing between several buttons and clicking on one of them'. Thus differing pedagogic requirements (wishing students to recall productively rather than by recognition) might lead to different tasks in HCI terms. What is important is that the interface should realize the pedagogic task, not that the interface should define the pedagogic task. The final three steps deal with testing, evaluating and modifying and are self-explanatory though designers should refer to the various tried methods with their accompanying advantages and disadvantages.

3. 4. Summary of HCI Factors

HCI principles have been developed to ensure the user can communicates easily with the software and, conversely, that the software communicates with the user. The interface

between pedagogy and program is most directly defined by the functionality the designer creates in the software. It is very important to understand this functionality in terms of computing and in terms of pedagogy. However, in reality most educators have to adapt to both a functionality and an interface that allows only moderate modification. Nevertheless, understanding the concepts brings an awareness to the design process that allows the best use to be made of the potential of any software or, in the rare case the designer can specify functionality and interface, ensures an ideal match between software and pedagogic purpose.

4. Principles Derived from Practice

4. 1. Introduction to Principles from Practice

The principles described in Section 1 would apply to a wide range of language learning tasks, not only those in which technology is involved. They are thus general principles of language learning applied to a specific aspect of such learning. Similarly, the HCI principles laid out in Section 2 are ones which could be applied to any human-computer interface. The principles discussed in this section, however, are more specifically related to the implementation of both CALL and BLL. Unlike the SLA principles, they are based on experience rather than theory.

4. 2. Integration

A main principle that has been expressed from the start is that learning carried out using technology should be very closely integrated with that carried out F2F. As far back as 1999, Crompton, reporting on a large scale project at Manchester University pointed out as follows:

'*To a great extent, therefore, the success of this type of internet material is first to make it an essential part of coursework, second to ensure that it is emphatically integrated into the mainstream of the course.*'

The same point is made by Ayres (2002), '…CALL work needs to be linked tightly with the course curriculum.' Crompton (1999) found that one of the best ways to integrate was to put essential work in the web element of the course and extending or enhancement work into the classroom. For example, basic grammar or new vocabulary could be introduced via the CALL element of the BLL while conversations using the grammar or vocabulary could take place in class. The need to integrate is driven in part by the requirement to motivate students to perform work which is typically done away from the classroom. One major weakness of pure online learning is the high drop-out rate. BLL can avoid this problem or the similar one of low rates of traditional homework completion by

the degree of pedagogic integration, in other words whether the activity in the classroom is directly based on the CALL element. This factor is cited by Stracke (2007) as one that students themselves evaluate highly: she calls it 'the complementarity of F2F and independent learning phases.' Other factors identified by Crompton as strengthening integration with F2F are to make access to the F2F teacher easy within the technological component either through e-mail or a bulletin board. It is also beneficial if students are aware that not only are records kept by the system but that there is human monitoring by the F2F teacher of the CALL work. Allum (2003a) suggests a paper-based outcome to some of the CALL delivered out-of-class work is useful as the relevant sheet can be brought to and used in class where it serves not only as a means for teachers to evaluate the results of the CALL work but also provides the basis for F2F work thus ensuring very close integration. Yet another important aspect of integration is keeping a unified methodology across both elements (Neumeier, 2005, Allum, 2003b). The teaching approach should be consistent.

Stracke (2007) has elucidated a few other factors that may be of lesser importance: variety of media, flexibility of time, choice of activity etc. Neumeier (2005) has suggested that it is important to specify what modes will be used (e-mail, interactive CALL exercises, web quests, Chat etc.) and make sure the relationship between them, in particular, which is the lead mode (the one which students refer to in order to guide themselves through the material) is quite clear, and that the pedagogic purpose fits with the mode.

4. 3. Summary of Principles from Practice

There is very wide support for the principle of close integration of the F2F element and the CALL element in BLL. This is overwhelmingly important to the success or failure of this paradigm of learning. This in turn supports the suggestion made in the introduction that there is a strong need for BLL to be designed from the ground up.

5. Sketch of Application of Principles

This section gives a brief glance at how these considerations might apply to one element of a BLL course, the teaching of vocabulary.

5. 1. Application of SLA Principles

As mentioned earlier (Section 1), the design process should probably begin with reference to SLA principles. Within the general principles applicable to BLL, there are more specific ideas suggesting how vocabulary is best learnt. As mentioned above, Nation (2001) suggests that three stages are necessary for acquisition of new vocabulary:

noticing, retrieval and generative use. Nakata (2008), on the basis of general theories of memorization, suggests that 'spaced' learning is effective for long term retention. Laufer & Hulstijn (2001) suggest that 'task involvement' is important. This factor is constituted by three elements: need, search and evaluation. Need refers to the learner's need to use the word, search to the requirement to find the necessary form for a particular meaning, and evaluation to the process of assessing whether a particular word is suitable to the communicative task. In more detail, need is moderate when a learning task demands it but strong when a learner needs to use it to express him or herself. Search is moderate when it is necessary to retrieve the meaning for a given form but strong when form has to be found for a learner's meaning. Evaluation is moderate if a context is provided but strong if the learner has to create a context in which a word can be suitable used. Overall, the difference between moderate and strong involvement is that between recognition and production of words.

How can these principles be implemented in BLL? What is first required is for students to 'notice' the word. This may of course occur naturally. However, depending on the overall task – for example reading or pure vocabulary study – 'noticing' can be encouraged by techniques such as highlighting key words in text and having a link to the meaning (perhaps in L1) or simply presenting decontextualized vocabulary items in, for example, a matching exercise, in which L1 and L2 are matched. Nation (2001) suggests that it is important to match form and meaning clearly and quickly, and to decontxtualize the word to be learnt. Both these aims can be achieved by either of the suggestions made above. Once a word has been brought to the attention of the learner, it is important that retrieval be practiced. Retrieval can be divided into two types, receptive (getting the meaning for a form) or generative (getting the form for a meaning). While both Nation (2001) and Laufer & Hulstijn (2001) suggest that generative recall is likely to lead to longer term retention and deeper learning, it is clear from a general pedagogic viewpoint that cognitive load needs to be taken into consideration. This suggests that receptive recall is a lighter load then productive recall. Thus, following 'noticing' and 'decontextualisation' an exercise in which form is provided but meaning has to be recalled is ideal. In addition, the cognitive load will be lighter if context is provided. This suggests an exercise in which students have a list of words and sentences in which they have to pick the words from the list and drop them into the appropriate sentence – filling in the blanks from a list. At the next stage, principles suggest it would be best to involve productive recall perhaps with the aid of context. Productive recall is more effortful than receptive recall but providing a context again lightens the load. Thus sentences with blanks could be used but no list would be provided. The sentence context would suggest the meaning but the learner would have to provide the form. Both receptive and

generative exercises should probably then be repeated but with use of the word in a different grammatical form or with a slightly different meaning. Nation (2001) indicates that this development of knowledge of the various forms and meanings of a word is essential for it to be fully learnt. The final stage would be use of the word productively, showing suitable 'evaluation'. This stage may best be performed in F2F work. However, there is still more work that the CALL element can handle. That is the element of 'spacing' (cf. Nakata, 2008). This requires that the new item appear frequently at first but then with increasing 'spaces' or gaps between exposures. It is a simple matter for the CALL element to record both frequency of exposure and accuracy of use. These can then be fed into an algorithm that would program exposure over increasing intervals.

Though this is only a sketch of the application of SLA principles, it is quite clear that such application leads to practical design decisions that are theoretically sound.

5. 2. Application of HCI Principles

Here I will give an example of just one step, the defining of the user. The typical criteria used to define a user might be as follows: age, frequency of use, mandatory/ discretionary use, computer experience, education, motivation, goals, training, language issues etc. We might for a student at a Japanese university come up with the following profile: 18-22 years old, twice a week use for a total of 3 hours, mandatory use, computer experience ranging from beginner to intermediate, limited motivation for study outside classroom, goal to complete required element of course, possible problems with English spelling for input, with explanations etc., limited training time, undergraduate level of education.

This definition alone would result in creating a user interface that was relatively simple (for beginners, fairly low frequency users, those with limited time for training), that had back-up explanation in Japanese, that put special emphasis on being motivating etc. For the latter purpose, for example, there might be a 'reward' system in the feedback – a message or sound, or a message from the instructor if a certain target were reached. Because of the limited training envisaged, there would need to be a good 'help' system and a design which encourages intuitive learning, in which intentions are easy to map onto interface. Given the language issue, in the feedback from the CALL program in response to student input (typed input required in the generative learning stage of vocabulary) there should be a spell-check function that gives feedback that the answer is right (i.e. the student has produced the right word) but the spelling is wrong. This could then tie in with a scoring system that perhaps penalized slightly for spelling but gave credit for knowing the word.

Again, even taking one factor that HCI suggests be incorporated at the design stage

it can be seen that application of that principle leads directly to design decisions. And the application of such principles ensures a very usable interface whose functionality matches the pedagogic intention of the teacher, a pedagogy that itself is in harmony with that used in the F2F work and thus integrated in that critical aspect. For more detailed explication, readers are referred to Allum (2001) or Hemard (2003).

5. 3.　Application of Principles Derived from Practice

　　Given the importance of integration between the CALL element and F2F work, this is the area in which the designer must be most careful.

　　First, as mentioned above, as a result of an approach that starts with the application of a theory to both F2F and CALL work, there is a basic integration in pedagogic approach. However, as Crompton (1999) and Ayres (2002) make clear, there is a need for a closer type of integration in which that which is studied using the CALL element is vital to that which is learned F2F. While there is a need to make the CALL work essential, it is also important to be aware of the limitations of CALL ware: some kinds of work are not really possible through CALL. For example, in the case of vocabulary learning, it is important that the stage of evaluation be part of the learning process, but the 'strongest' form of this would be for a student to use the word in a context that he or she had judged to be suitable. This is very difficult to engineer into a CALL exercise and would be far more suitable for spoken production in the classroom. Within the context of vocabulary learning, it has already been suggested in Section 4.1 that theory would lead to a progression of exercises to introduce new vocabulary. Most of these are eminently suitable for CALL delivery. Matching (noticing) is easily realized with a drag-and-drop exercise. The same technique can also be used to realize retrieval exercises. For generative use, simple typing in the blanks with the feedback suggested above can be used. In terms of integration within the progression of learning, it means that all the initial work of learning new vocabulary can be done by the CALL element. As also mentioned above, however, the final stage of evaluation is far more suited to the classroom, F2F, as is, of course, any spoken production. By having the final stage in the classroom, a very close integration in terms of pedagogic 'flow' is achieved. However, further integration can be achieved by adding teacher evaluation to work done with CALL, as Crompton (1999) mentions. Such evaluation can be achieved by having F2F tasks that require display or use of items studied in the CALL portion of BLL. This could take the form of having a small test, or congratulating students who had completed all the CALL work (something that can be learnt from CALL ware logs), or ing an initial exercise that assumed knowledge of the new vocabulary in which students could show that knowledge, etc. Clearly the learning in the CALL element is essential to the F2F in this case and thus is far

more likely to be both completed and properly absorbed.

6. Conclusion

This paper has brought together elements from several other papers together with some new insights in an attempt to provide a broad outline of a simple but effective process for designing effective BLL materials. BLL has great potential that is not being well exploited yet partly because it is hard for publishers to come up with an economic model for its production, partly because it needs to be integrated into curricula, (and this requires large-scale innovation), and partly because its design is not always sound. It is the last of these issues that this paper hopefully helps to address by building on the suggestions of writers like Levy (1997, 2002), Chapelle (2001) and others who have also focused on the design process.

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