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ACHIEVING THE RIGHT SYNERGY: A CASE STUDY INVESTIGATING THE COMBINATION OF INGREDIENTS FOR EFFECTIVE BLENDED LEARNING

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ABSTRACT

Jay Cross writes in the forward for Bonk and Graham's "*The Handbook of Blended Learning*" (2006) "Interaction is the glue that holds all ...pieces together. Interaction comes in many forms, ... learner and instructor, ... learning-to-content, learner-to-learner and learner-to-infrastructure." (pp xix). Blended learning falls along many dimensions. Different learning situations and outcomes require different blends of pedagogical approaches. Carman (2002) discusses five key ingredients that he believes are important elements for a blended learning process based on an appropriate blend of learning theories. These ingredients are: live events, self-paced learning, collaboration, assessment and performance support materials.

This paper investigates what would be the right blend of these key ingredients in encouraging interaction to keep learners active and motivated. A group of in-service teachers were provided with these five key ingredients in one of their courses at the National Institute of Education. Their feedback was sought at the end of the course as to what they felt assisted them in their learning. This study hopes to provide some insightful thoughts into the question of what would be the right blend in sustaining active learning among in-service teachers in a blended learning environment.

INTRODUCTION

Blended learning is now the latest buzzword in the educational as well as corporate sector. Although the phrase has different meanings to different people, it is increasingly being used, to describe a blend of online and face-to-face activities. ‘What is ‘blended learning’? It is the use of two or more distinct methods of training. This may include combinations such as: blending classroom instruction with online instruction, blending online instruction with access to a coach or faculty member, blending simulations with structured courses, blending on-the-job training with brown bag informal sessions, blending managerial coaching with e-learning activities.’ (Elliot M, 2003)

While most acknowledge the advantages of eLearning, there are also those who are reluctant to give up their face-to-face teaching approach. Both the approaches have their own advantages, and blended learning gives you the best of both worlds. Thus, with blended learning, teachers do not have to replace their tried and tested traditional methods of teaching face-to-face but simply compliment it with additional online activities to provide their students with a richer learning environment.

With rapid technological innovations, the online environment provides even more opportunities. As we uncover the enormous potential of blended learning, the right question we need to ask ourselves is “What are the important ingredients that need to be present in a blended learning environment?” and “What would be the right blend of these ingredients?”

OBJECTIVES

This research project was initiated as a part of an ongoing effort by NIE to promote eLearning. Understanding what blended learning is all about and the important elements and the right mix necessary for the blend, will help educators in better planning their e Learning activities in future.

THE STUDY

Blended learning is a powerful training solution that combines e learning with a variety of other delivery methods for a superior learning experience. (Caroline Gray, 2006). The study conducted by Graham, Allen, and Ure (2003) found that, overwhelming, people chose Blended Learning for three reasons: (1) improved pedagogy, (2) increased access and flexibility, and (3) increased cost-effectiveness.

As more and more educators acknowledge the benefits of blended learning, it becomes crucial to have an in-depth understanding of the blended learning approach. Traditional face-to-face learning environments have been around for centuries, with new technological advances the online environment brings with it, enormous opportunities to enhance students’ learning and compliment the traditional mode of learning. Although it is difficult to predict what the future holds in terms of blended learning, it is interesting to know what Charles Graham has to say about the past, present and future of blended learning.

According to Jared M. Carmen (2002) there are five key ingredients that emerge as important elements of a blended learning process:

1. **Live Events:** Synchronous, instructor-led learning events in which all learners participate at the same time, such as in a live “virtual classroom.”
2. **Online Content:** Learning experiences that the learner completes individually, at his own speed and on his own time, such as interactive, Internet-based or CD-ROM training.
3. **Collaboration :** Environments in which learners communicate with others, for example, e-mail, threaded discussions and online chat.
4. **Assessment:** A measure of learners’ knowledge. Pre-assessments can come before live or self-paced events, to determine prior knowledge, and post-assessment can occur following scheduled or online learning events, to measure learning transfer.
5. **Reference Materials:** On-the-job reference materials that enhance learning retention and transfer, including PDA downloads and PDFs.

Ingredient 1: *Live Events*

According to Carman, live, synchronous events are a main “ingredient” of blended learning. One of the significant drawback of a fully online learning approach is the lack of human contact. While communication between two learners may take place through asynchronous discussion boards or e-mail, or synchronous methods such as chat or telephony, a lack of face-to-face contact with other students and the instructor can detract from the learning process (Pineheiro, Campbell, Hirst & Krupa, 2006) by limiting the number and effectiveness of verbal and visual cues (Rovai & Jordon, 2004; Osguthorpe & Graham, 2003) and reinforcing a sense of isolation (Rovai, 2003). [Cited from Fresh Faces in Blended Learning Environments]

Ingredient 2: *Self Paced Learning*

Carman states that self-paced, asynchronous learning events add significant value to the blended learning equation. As educators constantly try to design student center environments, designing self-paced learning activities is truly in that direction. In self-paced learning, the learning is controlled by the learner. Thus, the learner feels empowered and has the freedom to learn at his own pace and at his own convenient time. One of the major advantages of self paced learning is that students who are fast don't have to get frustrated or bored at the pace of instruction while those who are less capable can learn at their own pace without feeling overwhelmed.

Ingredient 3: *Collaboration*

The third ingredient according to Carman is collaboration and he states that a blended learning environment should be designed in a way that allow instructors and learners to collaborate synchronously, in chat rooms, or asynchronously using email and threaded discussions. People construct knowledge socially through collaboration and discussion. It is this social process, that results in meaning and understanding. (Duffy et al, 1993).

Collaborative learning is the umbrella term encompassing many forms of collaborative learning—from small group projects to the more specific form of group work called cooperative learning. (Nagata and Ronkowski 19981).

As we move away from our traditional face-to-face approaches, one of the major disadvantages is a loss of social interactions and a loss of the sense of community that we usually see in a traditional classroom setting. Virtual classrooms and online communities that can be build because of technological advances, makes it possible to imbibe in the students

the sense of community, which they would have otherwise missed in an online learning environment.

Ingredient 4: *Assessment*

Assessment is a systematic basis for making inferences about the learning and development of students the process of defining, selecting, collecting, analyzing, interpreting and using information to increase students learning and development. (Erwin T.D, 1991). The most critical ingredient according to Carman in a blended learning environment is assessment, for two reasons: 1) It enables learners to “test out” content they already know, fine-tuning their own blended learning experience, and 2) It measures the effectiveness of all other learning modalities and events.

Self assessment tools not only helps to give formative feedback to students but it also allows them to practice what they have learnt and thus facilitates learning by helping them in reinforcing the knowledge acquired. While self-test tools have their own advantages, online environment provides several tools that can be used by the teachers for designing more holistic assessments.

Ingredient 5: *Performance Support Materials*

According to Carman the most effective performance support materials are printable references, job aids and PDA downloads. While students are learning independently in an online environment, this online material provide just-in-time support and help in bridging knowledge gaps among student as well as provides materials for better understanding of the subject being learnt.

In our study, we not only acknowledge the importance of having the key ingredients in a blended learning environment but also having the right mix of it. With this goal, this paper investigates the right mix of the five key ingredients of a blended learning environment based on Carman's study of blended learning design (2002) and also suggests another important ingredient Differentiated Instructions that adds more flavour to this recipe of blended learning.

METHOD

The in-service teachers who participated in this study were part of a module, "Computers in Special Education" which is one of the compulsory core modules for teachers pursuing a two-year Diploma in Special Education programme. A blended learning approach with all the five key ingredients was adopted to teach the module. A questionnaire was administered to determine what the participants felt about the five key ingredients of the blended learning process. The questionnaire required them to rank the five key ingredients in order to investigate the importance of each ingredient in their learning process.

Additional open-ended questions were also asked to gather data about their experiences on the blended learning approach. The Blackboard® online survey tool was used to administer the questionnaire. A system-generated report was obtained. There were 100% valid returns from all the 24 teachers surveyed.

Results

The feedback towards reactions and experiences of teacher trainees pertaining to blended learning approach was quite encouraging with more than 80% of the participants giving positive feedback about the importance of face-to-face sessions as well as online activities. A

large majority of respondents felt that the online assessments and support materials facilitated their learning process. 92% of the respondents felt that the online assessments provided them with opportunities to reinforce what they have learnt. The highest positive response was for support materials provided, 96% of the respondents felt that the online learning materials and resources supported my learning process.

These findings illustrate that learners felt that it is important to have a face-to-face session along with the online components. The students also feel that the online sessions provided them opportunities to access their learning materials at their own convenient time. Almost all the students agreed that the online activities designed to assess the students' knowledge helped them to reinforce their learning and the additional learning materials and resources provided, supported their learning process.

Having established the importance of the blended learning environment, the study then moved on to investigate the importance of every individual ingredient that facilitated the learning process. In order to investigate what according to the teacher trainees, was the right blend of ingredients, the respondents were asked to rank from 1 (least important) to 5 (most important) the five main ingredients in the blended learning process based on Carman's model, and the data gathered was analyzed. Surprisingly the respondents' ranked online collaboration with their peers as the least important (24%), while online materials to support their learning process as the most important (68%)

The table below shows the students preferences of the ingredients in a blended learning process

Ranking of ingredients in a blended learning process	Importance given to each ingredient	Ratio derived on the basis of the importance
Face-to-Face Sessions prior to e-learning	43 %	20%
Learning at my own pace	48%	22%
Online Collaboration with my instructors and peers	24%	11%
Online assessments to test knowledge gained	32%	15%
Online materials to support my learning process	68%	32%

(The ratio derived can be used as a rough estimate of the proportion of each ingredient that can be used in a blended learning process)

Thus, the key ingredients based on the students’ preference can be shown using the pyramid below:



From the results above, it is clear that for a right blend of ingredients, the instructor should ensure that sufficient support materials should be provided since according to the respondents, it is the most important ingredient in a blended learning process. The next

important ingredients are face-to-face sessions as well as self-paced learning materials, which are almost equally important according to the respondents. Online assessments are considered important but not as much as the other ingredients namely, support materials, face-to-face sessions and self paced learning materials. Of least importance according to the respondents is online collaboration and is ranked last.

This could also indicates that students who are not very experienced using technology for their learning process may look at the online environment mainly to get additional support materials to facilitate their learning process. Thus, while designing instructions for them the emphasis can be more on the support materials rather than on online learning or collaboration. As they get used to the blended approach the recipe can be changed to suit the comfort level of the learners or rather the recipe will depend on the learning outcomes rather than the learners preferences.

The responses to the open-ended questions asked to find out whether students preferred the blended approach, a large majority were positive about their experience. More than 90% of the students responded positively.

A concern raised by the two of the respondents about this approach was about getting help from the lecturers if they encounter problems. The following are the concerns by the respondents:

“Certain queries can be answered via emails. However, we sometimes need demonstrations by the lecturer when we get stuck.”

“I prefer face-to-face learning approach as problems encountered can be solved quickly and it enhances interpersonal and communication skills.”

Although face-to-face sessions have the advantage of immediate feedback to students varying learning abilities, we would like to suggest an additional ingredient 'Differentiated Instructions' which is an important ingredient to cater to the learners' ability as well as their motivation level. This becomes even more critical because in a traditional classroom environment the teacher is able to gauge the students understanding of the subject and is able to adjust the teaching style according to their needs, this becomes difficult in an online environment as the teacher has no cues on whether the students are satisfied or frustrated with the online content provided . Differentiated Instructions according to us is especially important to motivate the students in a blended learning environment.

Thus, differentiated instructions being an important ingredient, should be added to Carman's five key ingredients of blended learning. Hence, the six main ingredients necessary in a blended learning environment are: live events, self-paced learning, collaboration, assessment, performance support materials and differentiated instructions.

IMPLICATIONS OF THE STUDY

This study looks at the current and likely future needs of learners, and thus aids our future planning and designing of blended learning environments for our students. Although this study shows the students preferences towards each ingredient, as students get more familiar with the online environment we believe that eventually these preferences will change with time. For instance, the study shows that students give least importance to online collaboration; this could possibly be because they are very accustomed to traditional face-to-face sessions their preferences, which might alter as they get more, accustomed to the online environment. However, the present study helps us to understand what students currently consider as the most important ingredient in a blended approach.

LIMITATIONS

This study was done only over a window period of one week. Hence, it is difficult to derive more concrete results and conclusions. Much further investigation is needed with a larger population and a longer window of exposure if these results are to be valid for a wider population.

CONCLUSION

As we, educators discover the various advantages of blended learning, understanding the key ingredients and its right mix will help us to design an effective blended learning environment for our students. We hope that this study will help the teachers to make decisions while they are designing their instructions using a blended approach, by understanding the student's preferences towards each ingredient in the blend.

Using our results in this study, we would like to take our research one step further by looking not only at the blend of ingredients but understanding in greater depth what makes a good quality ingredient. For instance, for the ingredient of collaboration, what are the best practices and the theoretical underpinning for collaborative learning etc. This would greatly help us, as educators, to make the best choice of each ingredient and thus move towards a perfect blend.

REFERENCES

- Bonk, Curtis J. and Graham, Charles R. (2006). *The Handbook of Blended Learning. Global Perspectives, Local Designs*. Pfeiffer
- Carman, Jared M. (2002, October). Blended Learning Design: Five Key Ingredients, KnowledgeNet, Retrieved from [http://www.knowledgenet.com/pdf/Blended Learning Design 1028.pdf](http://www.knowledgenet.com/pdf/Blended_Learning_Design_1028.pdf)
- Caroline Gray, March 2006. Retrieved from Learning Circuits <http://www.learningcircuits.org/2006/March/gray.htm>
- Elliot Masie, Epic White Paper 2003 on Blended Learning, Retrieved from http://www.epic.co.uk/content/resources/white_papers/blended.htm
- Erwin, T. D. (1991). *Assessing student learning and development: A guide to the principles, goals, and methods of determining college outcomes*. Jossey-Bass Inc Pub
- Graham, C.R., Allen, S., & Ure, D. (2003). Blended Learning Environments: A review of the research literature. Unpublished manuscript, Provo, UT. Retrieved from http://msed.byu.edu/ipt/graham/vita/ble_litrev.pdf
- Pineheiro, M, Campbell, K, Hirst S. P., & Krupa, E. (2006). Creating appropriate online learning environments for female health professionals. *Canadian Journal of Learning and Technology*
- Schwier, R.A., Daniel, B.K. , & Ross, H. (2005). The nature of manifest learning in two virtual learning communities. Paper presented to the annual convention of the Association for Educational Communications and Technology, Orlando, Florida, October 20, 2005.