Blended Learning: Design and Implementation

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Introduction

Blended learning (BL) has become a "buzz word" in corporate and higher education settings. (Bonk, 2006) Swenson and Evans (as cited in DeNeui & Dodge, 2006) indicate there are many who prefer to call the blend of traditional face-2-face classroom techniques with online components hybrid learning However, hybrid and blended carry significant differences in meaning according to the Oxford English Dictionary (OED). Hybrid is defined as follows: "Derived from heterogeneous or incongruous sources; having mixed character; composed of two diverse elements; mongrel."(pg. 480) Blend is defined as "To mix and combine with something else; to form a harmonious combination or part of a whole."(pg. 915) Regardless of which term is used, ambiguity surrounds both terms as they are applied to learning. Blended learning has been described as the combination of face-to-face and technology-based learning, with an emphasis on blending the two. (Stubbs, Martin, & Endlar, 2006) Others choose to include teaching methodologies and pedagogies that change with the learner in their definitions of blended/hybrid learning.

Graham, Allen, and Ure (as cited by Bonk, 2006) documented that the three most commonly mentioned definitions are (a) Combining instructional modalities (or delivery media) (Bersin & Associates, 2003; Orey, 2002a, 2002b; Singh & Reed, 2001; Thomson, 2002), (b) Combining instructional methods (Driscoll, 2002; House, 2002; Rossett, 2002), and (c) Combining online and face-to-face instruction (Reay, 2001; Rooney, 2003; Sands, 2002; Ward & LaBranche, 2003; Young, 2002)

Elsenheimer states that blended learning should not only refer to mixing of training and delivery methods but also to the orchestrated application and integration of instruction, tools, performance support, collaboration, practice, and evaluation to create a unified learning and performance environment. (Elsenheimer, 2006)

Whether you choose to label this learning model as blended, hybrid, e-learning, distributed learning or mixed, the experts agree that BL emphasizes the role of computer-based technology in combining instruction from two historically separate models of teaching and learning: traditional face-to-face learning systems and distributed learning systems. (Bonk, 2006) An ultimate goal for using the blended/hybrid learning model is to maximize the benefits of both face-to-face and online teaching methods, in other words, using the best of what each of these learning environments has to offer students. (Osguthorpe & Graham, 2003)

For the purposes of this paper the term blended learning will be used interchangeably with web-based instruction and on-line learning.

Background on Blended Learning

Clark notes that educators are prone to think of blended learning as something new in current educational thought processes. However, technology is not something that was invented after we were born. All of the things we now take for granted at one time were new technology, such as cars, radio, telephones, and TV. There have been six major waves of technological innovation in learning: (a) writing, (b) printing, (c) broadcast media, (d) consumer storage media, (e) PC and CD-ROM, and (f) internet technology. (Clark, 2003)

With each wave of technology new forms of blended learning arose. The blended learning of today incorporates and embraces all the technologies that preceded it making blended learning possible on a worldwide network. (Clark, 2003)

Despite unprecedented levels of technology, the traditional method of instruction has dominated the classroom. (Clark, 2003) The traditional face-to-face learning system has been around for centuries and typically occurred in teacher-directed classroom settings with person-to-person interaction in a live synchronous learning environment. (Bonk, 2006) This learning model was passive in nature and viewed the instructor as the giver and the student as the receiver of information. The classroom, in recent years has been moving from a 'chalk and talk' delivery to an interactive and problem solving learning model. (Clark, 2003)

Today virtual schooling is one of the fastest growing areas in K-12 education. In 2003 the National Center for Education Statistics found that 36% of U.S. school districts had students in virtual classroom experiences. (Roblyer, 2006)

Benefits

Students turn to virtual classes to accelerate the pace of their study, when their own schools lack resources to offer classes they need, when physical handicaps or distance prevent students from attending a face-to-face classroom, or they want more flexibility in their schooling experience. (Roblyer, 2006) Equal access to quality education is a contributing factor to the benefits of web-based education. (Thomas & Southern Regional Education Board, 2000) An often unnoticed benefit of online instruction is the resulting increase in student and faculty information literacy that provides new abilities that benefit them throughout their lifetime, both in the academic arena and as career pursuits. (Dziuban, 2004) Faculty members who find a

totally online learning environment uncomfortable often see the blended learning environment as a better approach for transitioning into a web-based classroom. Faculty felt that in delivering the online courses their technology and online presentation skills had improved as well as upgrading course content to current information (Dziuban, 2004) Caro, McLean, Browning, and Hains (as cited in Singh, 2006) reported that as a result of taking online courses the students believed their technology skills had significantly improved.

Research has found that blended courses have increased student outcomes while lowering attrition rates for all ethnicities. (Dziuban, 2004) The blended courses provide an alternative instructional modality to replace strictly face-to-face instruction. (Blomeyer & North Central Regional Educational Lab, 2002)

Challenges

Federico (as cited in K. H. Wang, Wang, Wang, & Huang, 2006) sees one of the challenges in a web-based learning environment to be developing web-based learning that is suitable for the varied needs of today's students and designing conformity between the needs of the student and the learning environment.

After interviewing administrators and directors of schools offering web-based courses, M.D. Roblyer states there are 5 challenges in bringing web-based learning environments into the K-12 learning environment. They are: (a) Preparing the students for success. On-line instruction is rigorous and must meet demanding standards. (b) Prepare the teachers for success. Effective online teachers are made, not born. It is a leap to go from face-to-face to a blended environment. (c) Use interactive, flexible course design. (d) Monitor and support teachers. (d) Monitor and support students. (Roblyer, 2006)

Postsecondary education has been using Web-based courses for over 12 years and yet this same technology has been receiving attention in the K-12 schools for less than half that time. Before K-12 students can truly benefit from this technology issues surrounding student attendance, teacher workloads, funding, and credit requirements, to name a few, must be addressed. (Thomas & Southern Regional Education Board, 2000)

Potential

In a world where technology innovation is increasing at break-neck speed and digital technologies are an integral part of daily life it is assumed that those same innovations and technologies will expand the range of possibilities within the classroom. Whether by creating more effective learning experiences, increasing access and flexibility, or reducing costs in educating our students, the blend of face-to-face and computer mediated learning systems will be part of the future. The question will not be *whether* they blend but *how* to blend the best of both worlds. (Bonk, 2006)

Collins, Schuster, Ludlow, & Duff (as cited in Singh, 2006) indicate that web-based technology has the potential to reach large numbers of students geographically dispersed from one another. Technology will be a suitable media for meeting the unique needs of both students and professionals desiring to continue their education.

Course Design

In designing blended learning, Rowley & Cole (as cited in Yelon, 2006) state that course technologists must make thoughtful decisions to create a successful design for learning. Decisions such as what is go be taught face-to-face, what is taught on-line, and what will be

taught using other technology or media. The blend of all these components is critical to successful teaching and learning. Additionally, greater emphasis must be placed upon developing metacognitive skills, or learning how to learn, in order to: (a) enable students to take responsibility for their own learning, (b) regulate or check learning, (c) analyze and develop a critical consciousness, (d) reflect on all the information available to them from a variety of resources. (Condie & Livingston, 2007) Dezure, Buckley, Barr and Tagg (as cited in Charles D. Dziuban, 2004) noted that in the confluence of new pedagogies [the change from teacher-centered to student-centered], new technologies such as the internet, and new theories of learning have changed the face of education sufficiently to be described as an "educational transformation or paradigm shift".(p.2)

This paradigm shift brings with it a need for change in course design and development. Blended learning is a pedagogical approach that combines the effective socialization aspects of the face-2-face classroom with the technology enhanced online learning environment. Clark and Mayer (as cited in Yelon, 2006) say, "What we have learned from research is that it's not the medium, but rather the instructional methods that cause learning." (p.21) Thus, in designing BL course work, decisions must be made regarding the methods to be used: lectures, discussions, activities, videos, assignments, quizzes, tests, projects, forums, chats, and simulations – all procedures used to promote learning. Each instructional method should be analyzed according to the instructional purposes and strategies. (Yelon, 2006) Methods of online instruction may vary in complexity: from the simple email, which is also the most underrated learning tool, to discussion boards and video conferencing tools, to the virtual classrooms and integrated learning environments. All these methods have different technical, pedagogic, resource and cost implications. (Clark, 2003)

Blended learning should not be approached as a temporal construct but as a redesign of the instructional model with these characteristics: (a) shift from lecture to student center instruction; where the student becomes both active and interactive in the learning process, (b) increased interaction between student-teacher; student-student; student-content; student-outside resources, (c) integrated formative and summative assessments for students. Sound instructional design becomes critical with successful instructors reevaluating the design of the entire course rather than looking for bits and pieces to transfer to the web (Dziuban, 2004)

In developing a BL environment the type of blend an instructor might like to develop may differ considerably from the blend he or she is able to deliver. The human factor may be lacking in technology expertise to manage and develop an online environment. The technology infrastructure within the classroom may be less than what is required. Technical resources and support including IT department, network, back-end, security, and user access need to be in place. Budget and financial resources are of paramount importance in developing the BL classrooms. (Clark, 2003) Due to the demand for quality educational content presented through diverse technology tools, many schools have found it necessary to employ instructional designers and instructional technologists to assist faculty by reviewing and/or designing course content and applying technology tools to enhance the web-based learning experience. The roles those individuals assume may be consultant, developer, technical writer, and/or researcher.(Hillstock, 2005)

Teaching Strategies

It would be difficult to find a teaching strategy or learning system that did not include multiple methods for teaching and delivering content. Current technologies and available media

have placed constraints on the instructional methods that can be used in the classroom environment. (Bonk, 2006)

Planned instructional methods define formal education vs. informal and allow for distinctions between web surfing and e-learning. Instructional methods that move students from low levels of learning, exemplified by rote learning or memorization, to higher levels of learning, exemplified by critical thinking skills, revolve around some form of peer and instructor communication. (Kanuka, Rourke, & Laflamme, 2007) Tenebaum, Naidu, Jegede and Austin suggest that student achieve higher thinking patterns by participating in the following: (a) arguments and debates, (b) conceptual conflicts and dilemmas, (c) sharing ideas with others, (d) activities targeted toward solutions, (e) reflections and concept investigations, (f) meeting student needs, (g) making meaningful, real-life examples.(Tenenbaum, Naidu, Jegede, & Austin, 2001) The study conducted by Kanuka, Rourke, LeFlamme concludes there are three qualities to instructional methods that may contribute to higher levels of learning: (a) well structured, (b) provide clearly defined roles and responsibilities for the students, (c) provoke students to explicitly confront others' opinions.(Kanuka et al., 2007)

These teaching strategies are frequently found in the blended learning environment or e-learning course work.

Learning Theories

Garrison, et al. (Garrison & Kanuka, 2004) posit that "a worthwhile educational experience is embedded within a community of inquiry that is composed of teachers and students…learning occurs within the community through the interaction of three core elements: cognitive presence, social presence, and teaching presence" (p.88)

There is considerable disagreement among theorists who see learning as a process or those who see learning in terms of its outcomes. Over the last fifty (50) years considerable work has been done by cognitive psychologists such as Bloom, Gagne, Mager, Belbin, Merriam and Caffarella. In practice the schemas produced by these theorists are very similar and according to Donald Clark, 2003 fall into the following categories. They are (a) Knowledge – learning is dependent on memory and recall such as facts, figures, concepts, ideas; (b) Procedural Skills – following processes or routines, learn by doing; (c) Mental Skills – application of methods and theory to new situations; (d) Interpersonal Skills – listening, questioning, presenting, interviewing, communication; (e) Psychomotor Skills – acquisition of skilled movements and perceptual abilities; (f) Attitudinal – changing or developing new attitudes or values toward people, objects or concepts; (g) Aspirational – personal growth and profound change within the learner through deep reflection. (Clark, 2003)

Carman, 2002 summarizes the five key ingredients (Carman, October, 2002) emerging from these same theorists to be (a) live events - synchronous, instructor-led learning events; (b) self-paced learning - individual learning events completed on the learners own speed and timeframe; (c) collaboration - learners communicate with others; (d) assessment - measurement of students knowledge; and (e) performance support materials - reference materials to enhance learning.

All interpretations of the theorists point to a common perspective. The most prevalent theoretical perspectives related to online learning point to constructivism, particularly social constructivism and social constructionism. These perspectives focus on collaborative discourse, individual development of meaning through construction and sharing of social artifacts. (Dougiamas, 2002) Allison Rossett, professor of educational technology at San Diego State University, supports a "blended theory" approach to learning theories. See Figure 1. Rossett

says, "The goal is to have the right theory for the right situation" [situation includes the students, the skills to be taught, and the context for performance]. p.1 (as cited in Carman, 2002)

Taylor & Maor (as cited in Dougiamas, 2002)) report that the Constructivist On-Line Learning Environment Survey (COLLES) was designed to help assess the quality of on-line learning environments from a constructivist perspective. The survey consists of 24 questions arranged around the following scales: (a) Relevance – how relevant is the online learning? (b) Reflection – does the on-line learning stimulate critical reflective thinking? (c) Interactivity – to what extent do students engage in rich educative dialogue? (d) Tutor Support – how well do tutors enable students to participate in on-line learning? (e) Peer Support – do fellow student provide encouraging support? (f) Interpretation – do students and tutors make good sense of communications? (Dougiamas, 2002)

Learning Styles

Ford & Chen (Ford & Chen, 2000) believe learning styles are one of the more important influences on e-learning. Providing activities and strategies for learning that meet the unique differences of the students can motivate and encourage students to higher levels of achievement. Learning styles are valid predictors of success in a web-based environment. The difficulty comes in defining learning styles, even the scholars disagree. Kolb saw learning style as a unique learning method. Butler argued that learning style is used by the learner to realize the relationship between self and the environment. McDermott and Beitman indicated learning style is expressed in the learning process, which includes problem solving, decision making, and reaction of others. Gregorc and Entwistle pointed out that learning style is learner preference for certain learning strategies. Keefe defined learning style as characteristic cognitive, affective, and

psychological behaviors that indicate how learners perceive, interact with, and respond to the

learning environment. (K. H. Wang, Wang, Wang, & Huang, 2006)

The variety of thought concerning learning style is only magnified as it is applied to e-

learning or blended learning. Rasmussen and Davidson-Shrivers (as cited by Wang et al, 2006)

indicate most studies related to learning styles and the effects of e-learning have been done on

college and graduate level students and very few on middle and high school students. A study

conducted by S. Yoon (as cited by Wang et al, 2006) showed that learning styles and goal

accomplishment styles found in middle school students was able to predict academic

achievement as did a study by Chou and Wang (as cited by Wang et al, 2006) showing the

relationship between e-learning effectiveness and e-learning methods and learning styles.

Individual differences in learning styles may influence how students utilize online components as

well as the degree to which they benefit from them. (DeNeui & Dodge, 2006) However,

Gunawardena and Boverie (as cited by Wang et al, 2006) showed that learning styles do not

influence how students interact with media and methods of instruction.

Characteristics of Online Learners

In contrast to adult on-line learners, younger students need to have learning scaffolded as

part of the BL experience. Children are novices to knowing how to learn and study

independently. Adults organize and interpret information differently than younger students as

well as have better developed metacognition. (Cavanaugh, 2004) Another characteristic of

younger learners is their locus of control. High school students have a more clearly defined locus

of control which allows them to persist in an educational endeavor. (Cavanaugh, 2004) This

locus of control is what allows students to take responsibility for their learning. (Nachmias & Shany, 2002)

This recurring idea is expanded to include three strands to the characteristics of online learners, Condie and Livingston see as significant: (1) new technologies, (2) a shift away from learning facts and principles towards learning to learn, and (3) the adoption of constructivist theoretical underpinnings to learning to learn. (Condie & Livingston, 2007)

Authoring Tools for Online Learning

Currently there are over seventy two (72) Open Source Learning Management Systems. Among the eight (8) most demanded are Atutor, Bazaar, Bodington, Claroline, Coursemanager, Moodle, and Sakai. Each of these include features such as: Communication tools, file sharing, e-mail, chat features, bookmarks, group work, student community building, and student portfolios. (Uzunboylu, Ozdamli, & Ozcinar, 2006) Cole (as cited in Uzunboylu, Ozdamli, & Ozcinar, 2006) states that Learning Management Systems (LMS) offer a wide variety of tools to effectively upload and share materials, hold online discussions and chats, give quizzes and surveys, gather and review assignments, and record grades. Rowe (as cited in Uzunboylu, Ozdamli, & Ozcinar, 2006) suggests LMS allow instructors to enhance teaching via the internet without replacing the teacher. The LMS tools allow teachers without Web design skills or highly developed technology skills to write and develop on-line learning experiences using images, text, or other media on the internet without having to purchase or install software.

Course Implementation

Student Access

As of 2003, fifty percent (50%) of homes had access to the internet. This number has continued to grow. The Internet has pushed learning beyond the boundaries of the brick and mortar environment of the school, college, university, and library into the homes. With increased broadband capabilities, media types, streaming and download, students have greater access to knowledge and information both formal and informal. (Clark, 2003)

Web-based/Virtual Classroom Environments

The internet has made significant in roads to both formal and informal education. Web-technology has the potential to affect the way educators configure instructional settings and deliver instructional materials. These new educational configurations represent a supplement and alternative to traditional educational processes and environments. (Nachmias & Shany, 2002)

In looking specifically at asynchronous online discussions and face-to-face discussions, research identified key differences. These differences are: Access - Online discussions are more likely to have access problems due to more technical components. Timing - Asynchronous online discussions usually require a longer time frame to complete due to reading and reflecting, preparing and submitting responses. Mode of Expression – Responses are usually submitted in writing preventing the communication that comes from the verbal nuances of the human voice. Visual Cues – Visual cues are lost in online discussions. The non-verbal communication tools that dominate face-to-face discussion is absent in on-line formats. However, Walther (as cited in Wang & Woo, 2006) reports that online discussion were more task oriented and focused. The participants comments were more reflective and critical. The advantages of time and space

convenience were evident in the responses of the participants. (Q. Wang & Woo, 2007) Sotillo (as cited in Wang & Woo, 2007) also reports that the complexity index was higher in asynchronous discussions, as students had more time to write, edit, and rewrite. The online discussions were more comfortable, less aggressive and offered equal opportunities for all students to participate and offer their opinions. (Q. Wang & Woo, 2007)

Course Content

Media Rich

Sherry (as cited in Nachmias & Shany, 2002) reports that an on online course might consist of on-line information, communication, and educational activities. The course information base might include web-pages with hypertext, graphics, audio, video, and animation as well as easy access to web related resources. Both synchronous and asynchronous tools might supplement teacher-student interactions.

While technology is not always needed to bring resources to students, it certainly makes it easier to provide a compilation of resources, tools, and experiences. (Kirkley & Kirkley, 2005) With the advances being made in computer learning systems combined with emerging technologies such as, computer games, simulations, virtual worlds, and role play environments BL course content can be highly interactive and learner-centered. However, while newer technologies come into the BL environment older technologies are not going away. (Bonk, 2006) The challenge will be designing the learner-centered approaches to knowledge around the mix of old and new technologies to create a seamless media rich learning environment. (Kirkley & Kirkley, 2005)

Educational Packages, Modules, Units

Donald Clark, 2003 identifies four levels of blended learning which affect the design and content of the learning modules. Level 1 – Component – separate delivery channels added together to create a blend. Each delivery channel is a stand alone component. There is no limit to the number of components allowed; the number will be determined by the resources that are available and the learning goals which have been set. Constructivists argue this level allows students to construct their knowledge from the available resources. See Figure 2. Level 2 – Integrated – Components are blended to create a mutually supportive structure. Each component is designed with the others in mind. The learning components have common design features and cohesion. The linking of the components lends itself to making assessment a central component of this level. See Figure 3. Level 3 – Collaborative – brings a deeper level of cohesion to the blended components. This level includes face-to-face and collaborative activities. Learning management systems are geared toward this level of blended learning. The collaborative nature allows for one-to-one, one-to-many, and group-to-group activities. See Figure 4. Level 4 – Expansive – takes learning beyond the boundaries of predictable components. This includes incorporating print resources, electronic media, web resources, and even mobile learning. The boundaries of formal and informal instructional methods are blurred with the inclusion of newer technologies not always associated with formal education. The classroom environment is continues beyond the synchronous events that are part of the blended learning environment. See Figure 5.

In designing content to coincide with the developing prominence of the (social) constructivist approach curriculum, developers have emphasized the importance of skills such as communication, co-operative teams, problem solving and critical thinking skills. With the rapid

change and modification to knowledge and understanding the ability to monitor and direct ones

own learning is as important as the acquisition of facts, principles, and theories. (Condie &

Livingston, 2007)

In BL bringing together the instructional design, technologies, and appropriate materials

for student support is best represented by the term 'scaffolding'. (Jelfs, Nathan, & Barrett, 2004)

The materials support and guide our students until they are able to study and move through the

materials on their way to becoming independent learners. Scaffolding relies heavily on the

constructivist principles where students need to construct their knowledge with more

experienced others. (Jelfs et al., 2004) Oliver (as cited in Jelf, et al., 2004) gives scaffolding a

broader connotation to include learning resources, interactive technologies, and/or other learners.

Jelfs, et al. propose the need to establish scaffolding and support in a resource-based rather than

a demand-led environment. This requires a delicate balance between increased provision and

over-loaded provision in resource-based learning. Technology affords an approach through

which scaffolding is only there for as long as the student wants it. (Jelfs et al., 2004)

Student Roles

Attitudes and Satisfaction

A student's learning is affected by many factors, such as age, gender, socioeconomic

status, affective expressions motivation, learning experiences and learning characteristics.(K. H.

Wang et al., 2006) In BL students must cone to terms with the fact that previously successful

learning approaches may not be as successful in the blended environment. They must relearn

how to learn and recognize that a key to success is staying actively engaged and connected.

(Dziuban, 2004)

All students receiving web-based instruction need to be self-directed learners; taking responsibility for their own actions and learning. (Hillstock, 2005) Diaz & Cartnal (as cited by Hillstock, 2005) reported in a study conducted to compare online learning with face-to-face learning revealed that students in an on-line class were more independent in their learning styles. The face-to-face students were shown to be more motivated by receiving rewards or meeting a teacher's expectations, whereas the on-line learners were more intrinsically motivated and not by the reward structure of the class. Adapting to a self-directed learning environment can be a challenge to students. The nature of the learning environment, navigation of the course and external links, taking control of independent learning can impact student success rates in the BL environment. (DeTure, 2004)

Learning characteristics are often referred to as learning styles. As each student becomes aware of the characteristics of his/her learning style they can also develop strategies to prepare themselves for learning via a web-based classroom experience that will include synchronous and asynchronous class discussions, chats, quizzes and exams. (Hillstock, 2005) Sternberg (as cited in Nachimas, et al., 2002) describes attitudes and satisfaction to an online learning environment may be linked to the specific thinking style a student displays. These thinking styles are (a) Global thinkers who prefer to deal with large abstract issues, (b) Local thinkers who like concrete problems requiring working with details, (c) Internal thinkers who are concerned with internal affairs and often socially unaware, (d) External thinkers who tend to be extroverted and people orientated, (e) Liberal thinkers who like to go beyond existing rules and procedures, think outside the box, (f) Conservative thinkers who like to adhere to existing rules and procedures, enjoy structure.

The individual differences in thinking styles or combinations of thinking styles may be a predictor of success in BL environments. (Nachmias & Shany, 2002) It also seems reasonable to suggest that the opportunity to interact with a wide range of materials in a variety of formats, in a way that is appropriate to the students' needs and at their own choosing, may contribute to increased motivation and learning and understanding. (Condie & Livingston, 2007)

Attendance

Dissatisfaction with web-based courses can have a negative effect such as: students drop out of the class, students do not take additional web-based courses, and poor performance levels in the class. (Jones, Morales, & Knezek, 2005) Retention rate continues to be an issue in many distance education programs, but personal touch and ongoing support may have a positive impact in blended learning classrooms. The building of community through face-2-face classroom time and online learning and collaboration components resulted in 100% completion rate for the blended learning courses. (Martyn, 2003a)

Performance, Evaluation Assessment

Self-efficacy had been shown to have a significant impact on student performances. As confidence levels increase, performance levels increase as well. (DeTure, 2004) DeTure believes "Self-efficacy concerns a persons' confidence in their abilities to complete tasks or goals but is not based entirely on experience performing these tasks in the past" (p.34) Research indicates that a specific self-efficacy measure that matches a desired task is a better predictor of performance outcomes than a general self-efficacy measure. The result being that students who are more field independent have higher online technology self-efficacy (DeTure, 2004)

The immediacy of the web has opened doors for assessing the learning of students. The benefits of online assessment are numerous for the student. (Wang et al., 2006). Zakrzewski and Bull (as cited in Wang et al., 2006) found that online tests have four advantages for students. These advantages are: (a) students can take the test on demand, (b) students can take the test repeatedly, (c) students have access to instant feedback that helps remedy their weaknesses in their learning abilities, and (d) student anxiety can be reduced by taking formative assessments prior to summative assessments. Formative assessments include short tests, quizzes, question/answer within lesson context, and homework assignments. Buchannan (as cited in Wang et al., 2006) found that a web-based formative assessment is able to improve student learning, interest and scores. In considering formative assessment, research indicates both learning style and formative assessment significantly affect student achievement in Web-based learning. Both the formative assessment strategy and learning styles should be considered in the design of Web-based learning environments. The more diverse the formative assessment strategies, the greater the learning effect obtained by the students. (K. H. Wang et al., 2006) Also, research supports that students benefit from immediate feedback on formative and summative assessments. (Singh, 2006)

Teacher Roles

Mackeracher (as cited in (Groen, 2005) states that in a learner-center approach,[such as blended learning] the process of learning is central and the role of teacher is a responsive activity. Teachers adapt as their students acquire "knowledge or skills they need for themselves, their work or the world around them, or to solve problems" (Mackeracher, 1996, p.3) This alters the power structure and requires change in the BL classroom organization as students become

less reliant on the teachers. The focus shifts from teacher's teaching to student's learning. The

teacher becomes a primary source of support and providing opportunities for learning. The

students develop a sense of ownership of the learning process. (Condie & Livingston, 2007)

Lapadat (as cited in Groen, 2005) argues that knowledge is not handed down from the instructor

but constructed in the context of the student engagement with the course content.

Darling-Hammond (as cited in Wang, et al., 2006) indicates that successful teachers are able to

use a wide range of teaching strategies and interaction styles rather than a single, rigid approach

to teaching and learning. However, studies do indicate that highly structured, planned,

confrontational and demanding activity that includes directed roles and responsibilities for the

students' contributions move students to higher levels of understanding and critical thinking.

(Kanuka et al., 2007) Lapadat (as cited in Groen, 2005) argues that online courses have the

potential "to foster pedagogies and learning environments designed according to constructivist

principles."

Effective Instructional Practices

Teachers teaching a web-based course must be aware that course content and course organization

has a considerable effect upon the effectiveness of the class.(Singh, 2007) Garrison (as cited by

Groen, 2005) suggests that "the selection, organization and primary presentation of course

content, as well as the design and development of learning activities and assessment" is a pivotal

responsibility of the instructor. This is even more central in BL since the teacher is not physically

present with the students to serve as an immediate and responsive intermediary between students

and the content. (Groen, 2005)

Contrary to a traditional classroom, where the teacher has complete control over access to materials and content, in an on-line environment the teacher shares control of the class with the students. Students may be unable to find resources, access or review material on the web or the follow the presentation sequence the teacher prefers. Additionally, students may choose to skip the needed course content. (Singh, 2007)

In presenting effective online learning, Royai and Jordan (as cited in Groen, 2005) feel that creating a safe psychological climate which cultivates dialogue around learning experiences allowing students to share personal stories and socialize with other students is critical to the learning environment and students buy in to BL. A sense of community diminishes the feeling of isolation that often accompanies online classrooms.

Training to teach online

Successfully teaching online is related teacher readiness. Implementation of online instruction is dependent upon a teachers' confidence with the technical aspects of using an online classroom environment, the level of skepticism regarding the benefits of online course work related to their subject area, and their lack of understanding of the how to use of various technologies. (Condie & Livingston, 2007) Jones (as cited in Condie & Livingston, 2007) suggests that 'Many teachers who do not consider themselves to be well skilled in using computer technology feel anxious about using it in front of a class who perhaps know more than they do' (p.7). Many teachers see the use of computers as the removal or downgrading of traditional pedagogical skills. The need for pedagogical support related to online education is imperative for these teachers. (Condie & Livingston, 2007)

Several additional factors need to be considered prior to teaching in a web-based environment. One common misconception is the amount of time required to prepare and develop the online portion of a blended class. Baynton, et al. (as cited in Achieving the Benefits) have noted the importance of educators increasing the time commitment spent in planning and organizing the course work prior to the launching a BL course. They state that "course development is set once it is in the students hands; online teaching requires considerable upfront planning and organization."

Alford and Engelland (as cited in Hillsock, 2005) suggest a strong need for faculty training before course preparation and delivery. "As a result of training, instructors learn that they may have to change their standard teaching approach. Instead of the 'sage on stage' approach used in more traditional education, they likely must become more like a 'guide on the side'". (Alford and Engelland, 2001, p.1)

Secondly, the factors concerning communication must be addressed by educators wanting to teach online. Students enrolled in a web-based course expect fast responses from their instructors, much faster than in a traditional face-to-face classroom. Students feel that when questions or feedback is needed regarding the online portion of the class, their teachers are available 24 hours a day, seven days a week to offer guidance and assistance. With this level of communication, increased demand is placed upon faculty to maintain online support systems. These may come in the form of class discussion (chat times), emails, online grades books and assignment postings, study guides, class notes, and additional resources. To facilitate their students' needs, many educators incorporate course management systems into their courses. However, along with the course management system instructors discover additional time is required to learn and manage these systems. (Hillstock, 2005)

Another factor to consider is how to effectively use and choose appropriate technology. Many assume, incorrectly, that by simply including the internet as a portion of the course work that the work is done. Providing students access to internet data does not automatically expand student's knowledge or framework of ideas. The technology is just the tool for delivering the course content and content must be designed and developed. This requires time and technology expertise. (Hillstock, 2005)

Conclusion

Hybrid Learning

Hybrid learning, blended learning, online education or any other reference to this teaching model is open to multiple definitions and interpretations. The common element linking the terminologies together is the fact that all blend a traditional approach to teaching with today's current technology. Many experts want to define the labels placed upon this teaching model based upon percentages or time spend in each environment [face-to-face or online], such as, 40 percent online, 60 percent classroom. (Bonk, 2006) Regardless of the terms, definitions or parameters that are used the fact remain that blended learning is one of the fastest growing educational models. The National Center for Educational Statistics reports that "Seventy-two percent of districts with students enrolled in distance education courses planned to expand their distance education courses in the future."(pg. 15)

Course Design

The planning and development of BL environments will benefit from the study of students'

behavior, learning styles and thinking styles and the degree to which they are suited to web-

based instruction. In constructing learning environments well suited to a diverse student make up

of these students, various technological options should be examined to allow for the diversity of

student learning modes. Such research will enable educators to make informed use of

technology, to apply this knowledge to the development of educational tools, which will enhance

the teaching and learning process, and to offer courses that meet the majority of student needs.

(Nachmias & Shany, 2002)

Course Implementation

Today's students are more technologically aware than in previous years. More than

seventy-eight percent (78%) of pre-college students have used the internet for homework, not to

mention email. (Bonk, 2006) It seems natural for these students to gravitate towards the blended

learning environment to access content and course materials. Implementation of the blended

environment is dependent upon access. Access comes in several forms: (a) access to computers

by both the instructors, students and school, (b) access to the internet by all stakeholders, (c)

access to technical support. (Conceicao, 2006) The technology infrastructure must be in place to

create a successful blended learning environment. (Fong, 2007) Chou, 2002 states, "If the

assumptions that are made about the students' computer skills or accessibility are invalid, the

success of an online curriculum will be limited." (p. 625) To implement a blended classroom

environment is to also necessary to blend interaction between students, teachers, content and

technology. (Conceicao, 2006)

Course Content

In considering the course content for online learning, teaching strategies for supporting online learners must be considered. The course content must be learner centered and highly interactive. (Conceicao, 2006) Designers of online learning environments must be able to develop content that (a) is student centered, (b) contains self-directed elements and gives students a choice in their learning, (c) contains enriched curriculum and web resources, (d) provides scaffold and structure, (e) incorporates assessments and evaluations.(Chou, 2002)

Challenges arise in developing curricula, whether for face-to-face classrooms or for an online environment. Kearsley (as cited in Chou, 2002) notes that both environments require creativity, ambition, and teamwork; however, an online environment includes the ability to understand technology, hypertext structure, and digital multimedia techniques. This makes the process more time consuming, complicated and requires the inclusion of team members with unique skill sets. (Chou, 2002) However, underlying the success of online content is pedagogy. Byun, Hallett, & Essex (as cited in (Xu & Morris, 2007) agree that pedagogy is of primary importance when designers are developing online content.

The constructivist pedagogy is well suited to the collaborative nature of the blended learning environment. Social interactions combined with constructed learning require designers of online content to be mindful of prior knowledge and student-to-student plus student-to-teacher interactions. (Chou, 2002). Christensen (2003) states that, "Constructivist models stress the importance of learning by doing and just-in-time instruction where the need to seek and acquire skills or knowledge is driven by demands of the situation – where students first perceive a need

to know something to accomplish their goals and thus are more hungry to seek out useful,

relevant information." (p. 236)

Student Roles

Students in a BL find they are drawn into the subject matter of the class more deeply due

to the discussion focus of the on-line classes. The BL model fosters collaboration and active

participation among the students. The students are held responsible for their contributions to the

class discussion and ultimately construct their own knowledge based on personal experience.

(Martyn, 2003b) Students can combine new opinions with their own an create a solid foundation

for learning. This results in long-term retention and for higher-level cognitive and affective

objectives because students actively engage in the process. (Martyn, 2003b)

Teachers Roles

Teachers' understanding of their role as it fits into a BL environment needs to be more

fully understood, particularly the areas of (a) balancing the face-to-face and online environments;

(b) the methods for optimizing the links between teacher-directed and independent student study;

(c) the shared roles between teacher and student in the learning process. Changes in the

traditional role of teachers results in a shift in teaching strategies. The shift in traditional

practices may be seen as a threat; a loss of identity and loss of control over student learning.

Teachers need to be convinced that the discomfort this brings will be worth it in educational

terms. New learning contexts demand new learning and teaching strategies. Teachers must

realize that students are learning with computers rather than students are learning from

computers. (Oliver, 2005   .)

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Figure Captions

Figure 1.   Allison Rosett supports a blend of learning theories. The theories of cognitivism, constructivism, and performance come together to compose a balanced blended learning theory. The balanced theory allows the benefits and strengths of each individual theory to influence the others as they are utilized on a situational basis.
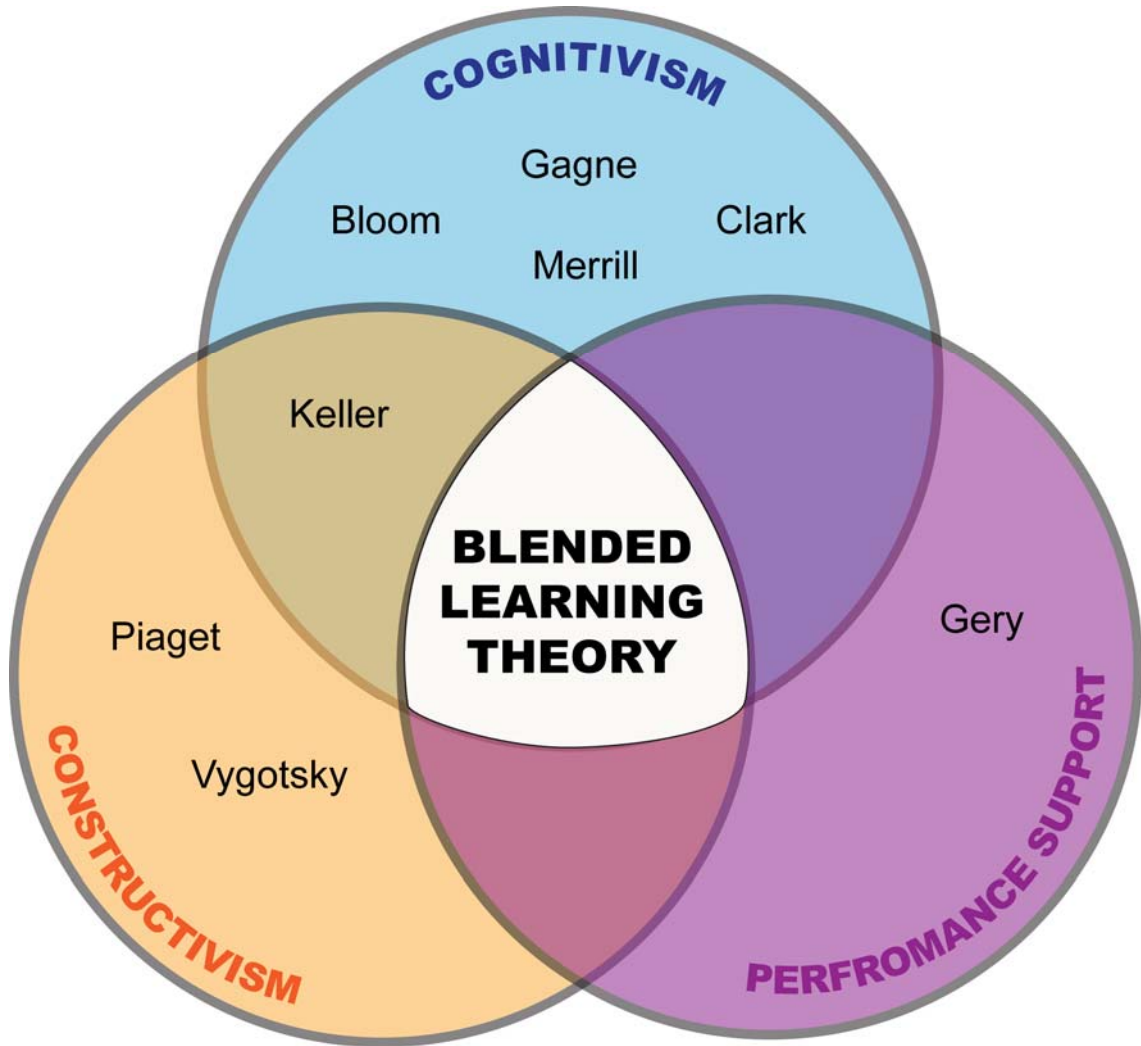
Figure 2. Level 1 – Component Blend. Each learning component is a stand alone element. The components can function as a separate learning component and is not dependent on the others.
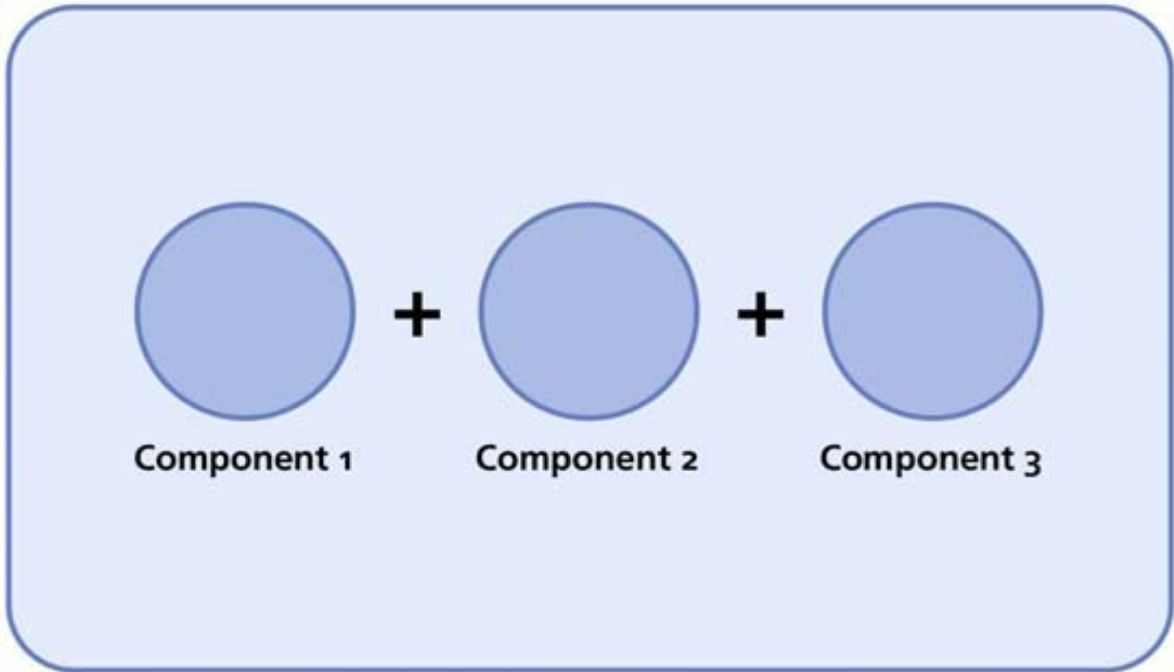
Figure 3. Level 2 – Integrated. The components are linked together to be a cohesive and supportive blend. The blending allows for summative evaluation of the components. The components are completed on an individual basis.

Figure 4. Level 3 – Collaborative. The components are linked in such a way to include the elements of collaboration. This may include forums, discussion groups, and peer evaluations.
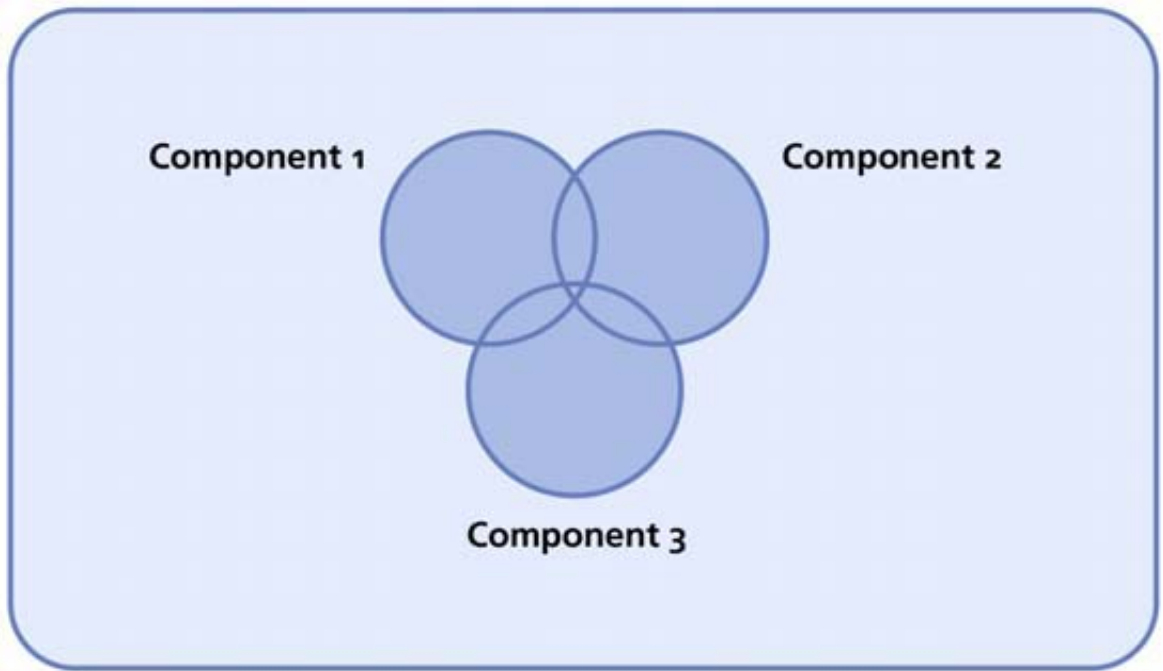
Figure 5. Level 4 – Expansive. The collaboration of level 3 is expanded to include components that are not always associated with the formal learning environment. These elements may include newer technologies and less formal classroom structures. This level will include both synchronous and asynchronous experiences.

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Component 1

Component 2

Component 3

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Collaborative environment

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