BLENDED LEARNING: THE OVERARCHING LEARNING STRATEGY

Blended learning is an instructional strategy that combines classroom instruction with technology-rich resources to enhance learning. It is realized by a team of instructional technology experts devoted to studying the effects that technology-based learning delivery environments have upon learning and educational institutions. Blended learning takes place in a traditional classroom directed by conventional teachers who interact with students face-to-face while controlling the content and pace of the lesson – they simply do it with technology tools.

If an observer were to look into a blended learning classroom from a secondary school hallway window for example, she would most likely observe students who were being taught by direct instruction (i.e., lecture or lecture-discussion) under the direction of a teacher using visual resources, an LCD projector and screen. During the same lesson, students would be noted participating in a web-based virtual tour or working together in small groups to enhance their social skills. Online instruction would be employed to appeal to those students who can work independently either to gain valuable remedial teaching opportunities for a learning objective missed or explore additional enhanced content while the teacher addresses other instructional tasks with other students.

Blended learning gives students the opportunity to receive personal attention while retaining the much-needed (for some) control provided by the face-to-face classroom environment. Simultaneously, students are building independence through learning with technology.

This text, *ICTs for Modern Educational and Instructional Advancement: New Approaches to Teaching*, examines some of the instructional challenges that have inspired faculty improvements in lesson delivery using both new and familiar technologies. In some cases, the articles presented herein discuss classroom applications that encourage new kinds of learning experiences that would not, otherwise be possible. Some of the common themes addressed in this text include:

- Anonymous online postings to increase student engagement
- Internet Usage and the associated safety implications
- Exemplary educational technologies
- Design principles for 21st-century educational technology
- Evaluating educational technologies
  - Bringing a large and varied quantity of multimedia into classroom presentations
  - Creating a content collection (multimedia) that can be searched and expanded
- Use Learning Management Systems in relation to students’ attitude and performance to enable students to share their analyses and reflections
- Online learning communities: connecting students with experts to encourage critical thinking
INTRODUCTION

Despite common misconceptions and the time-honored views of some, teacher-directed learning can successfully incorporate technology. Self-directed learning can occur using the Internet. A blended learning approach seeks technologies to make face-to-face learning more effective by removing the mundane aspects of basic instruction and supplanting them with a technology-rich learning environment that is more engaging and interactive.

When students meet in the classroom, face-to-face instruction focuses on higher-level skills since technology has delivered and evaluated learner competency during presentation of most of the required basics. Instructor-led sessions can focus on knowledge transfer and application and not simply the memorization of facts and jargon.

Blended learning represents the best of both worlds: traditional in-class presentations coupled with effective technology-based learning. The multiple modalities work well together to complement the lesson and course content so that students are able to cover the necessary subject matter even with limited classroom time. For example, one lesson plan offered by a cyber charter school calls for students taking a blended learning biology class to attend a face-to-face instructional presentation to learn the basics of Earth’s soil. Following the in-class presentation, students complete the majority of their class work by accessing course materials hosted by a popular learning management system. Each of the three component lessons includes part of a comprehensive online video provided by the renowned Annenburg Media (www.learner.org). The video entitled, Session 1. Earth’s Solid Membrane: Soil, discusses how soil began to appear on the Earth, how it is formed, its role in certain Earth processes, its composition and structure, and its place in the structure of the Earth.

Learners are asked to instant message or email their instructor with any questions. As the lesson progresses, instruction is enhanced by in-class labs, providing the opportunity to do hands-on experiments under teacher supervision as well as web-based virtual tours of Earth’s top three levels (core, mantle, and crust). Finally, students submit an electronic portfolio of images and text that they gleaned from the resources provided or found on the Internet.

Blended learning exposes students to a host of valuable tools not afforded the traditional in-class learner. Working online encourages students to improve their technology skills including computers, electronic mail, preparing electronic documents, and more. With a blended learning curriculum, students use technology to participate in lessons, take quizzes and exams, and communicate with teachers and other students. By doing so, they learn not only course material but also valuable real-world skills necessary in the knowledge-based world they will encounter in higher grades, college, and the work environment.

At the same time, schools save substantial financial investments often at a much low per-pupil cost. Greatly advanced from just 15 years ago, blended learning lessons require schools to access shared technology (e.g., desktop and laptop computers and Internet connections) that were once very expensive and have now been relegated to the status of commodity items for most schools and many parents.

Greater effectiveness, multiple modalities of learning, and advancement of individual technology skills are just a few of the ways in which blended learning contributes to the bank of instructional teaching strategies in today’s classroom.
Let’s look at some of the most popular blended learning technologies for the classroom – many of which are addressed in one or more of the chapters that follow. The technologies will be divided into asynchronous and synchronous categories to better discuss their advantages and limitations with respect to blended learning applications.

**BLENDED LEARNING TECHNOLOGIES**

**Asynchronous Learning**

Asynchronous teaching and learning involves the separation of instructor and student – in both physical and chronological perspectives. Often, asynchronous teaching involves lessons that are delivered online and do not require live attendance. Collaboration and engagement happen over time with the direct application of specific technologies. Online course environments, in particular, lend themselves to teachers and students communicating with one another anytime and anywhere.

There are several advantages to asynchronous delivery systems. For example, they are typically more flexible, allowing continuous access to teaching material without interruption or delay. Asynchronous materials give students time to reflect on content and formulate responses rather than the typical classroom expectation that requires immediate reaction to instructor questions or peer-initiated comments. They allow the learner to ponder new ideas and concepts, locate additional references, and prepare a more scholarly reply. If the online session is captured and archived, students have the additional capability to review the lesson either for content or to prepare for an assessment.

Asynchronous technologies allow access from home or work (aka situated learning). Since a growing number of students fit the characteristics of the “non-traditional learner,” it seems reasonable that the delivery methods employed to teach these courses offer more options. Finally, asynchronous teaching is oftentimes more cost effective requiring less bandwidth and lower-end technologies to operate than was the case a mere 15 years ago. Issues of accessibility once restricted blended learning opportunities to only the wealthiest of schools and student populations; thankfully, that is no longer the case for many communities.

The primary drawback of asynchronous technologies is that they require some discipline to use in a community of practice. For example, participants in an online discussion board must take the initiative to join the session periodically to pick up the newly posted messages and respond in a timely manner. To many learners, asynchronous learning may feel “impersonal” to those who prefer the more personal synchronous technologies.

**Asynchronous Technologies**

Asynchronous tools enable communication and collaboration over a period of time through a “different time-different place” mode. These tools allow learners to share the educational experience at their own convenience and according to their own schedule. Asynchronous tools are useful for sustaining dialogue and collaboration over a period of time and providing people with resources and information that are instantly accessible regardless of time. Asynchronous tools can engage learners from multiple time zones while chronicling the exchanges of a group for later examination either by other students or by the instructor.
Here are some of the most popular asynchronous technologies suitable for infusion in a blended learning curriculum.

**Email and Instant Messaging.** The two most successful asynchronous tools, by far, would be email and instant messaging. Email, e-mail or electronic mail is the transmission of messages (emails or email messages) over a network (most commonly these days, that would be the Internet). Instant messaging, abbreviated IM, is a communications service that offers an asynchronous version of a “chat room” (more on chat rooms in the synchronous portion of this discussion). Typically, IM is conducted with one other individual at a time and can be readily compared to a text-based telephone conversation using text rather than voice.

Instant messaging is more interactive than e-mail because messages are sent immediately. However, e-mail messages can be more extensive and sent to more recipients. Email options are more elaborate (e.g., page layout, attachments, etc.) while the IM message is short (often limited to 128 characters or less).

Since both email and IM are among the most ubiquitous technologies on the market and most educators are intimately familiar with both, this discussion will move quickly to the practical applications of these technologies for blended learning.

**Discussion boards.** A discussion board (aka electronic discussion group, digital discussion forum, online message board, and online forum) is a general term for any online bulletin board that offers the user the opportunity to post messages, track read/unread message, and reply to messages. Discussion board messages are usually sorted within categories, topics, or themes chosen by the host or monitor in a threaded or straight-line format.

The flat format displays messages in a strictly chronological order. Someone joining the conversation will see new messages appear at the end of the discussion thread regardless of which message is receiving the reply. The conversation may be more difficult to follow and the context of the discussion may require the user to scroll up and down the postings to find those directly related to the topic at hand, but the flat format provides a more suitable chronology of posts and responses when dealing with a single-focus topic.

The threaded format displays posts in a logical, conversational order similar to an outline with bullets and sub-bullets. A response (reply) is indented under the initial message making it clear which posting pertains to which message. The discussion flows clearly from one message to the next. For shorter messages, the entire message can be shown in the subject line, making conversations even easier to follow and saving on bandwidth since every message does not have to be opened to follow the conversation.

Blended learning uses discussion boards to help their learners master the complex skills of asynchronous collaboration. Bruck (2005) has identified *A Five-Step Model for High Impact Learning* that illustrates how this model fosters the communication of content, questions and answers, skills practice, apprenticing/ coaching, and teaching.

**Web logs (Blogs).** Defining a web log or blog often takes the form of an explanation of its various purposes rather than any distinguishing characteristics. For example, there are personal blogs (i.e., diaries of not-so-private activities over time), corporate blogs for business purposes, and FAQ (frequently asked questions) blogs that focus on a particular problem or situation. Blogs are also defined by the media they employ; for example, a blog comprising videos is called a vlog. Blogs shared via cell phone are called moblogs (mobile blogs). Finally, some blogs are defined by their type: a teaching blog for educators, a techie blogs for technologists, and the like.
Generally speaking, blogs are online journals created by linking individual postings in reverse chronological order so that the most recent postings appear at the top of the web page. In other words, a blog is basically a journal made available on the Internet. The function of entering or updating a blog is called “blogging” and those who maintain a blog are called “bloggers.” Blogs are characteristically updated on a daily basis using content management software specifically designed for creating and maintaining large amounts of frequently updated web pages.

A blog post has three basic elements: a title, links to related sites, and a narrative. Some blogs only have the narrative section, others always have all three. Most blogs require a title for purposes of tracking the posts and to serve as a permalink for the item (a URL that links to a specific posting that allows blog entries to be bookmarked by visitors).

Most blogs site permit short posts – a paragraph or two at most. Others provide for longer articles or stories along with an option to provide the browser a summary of the complete blog post.

There are many advantages of blogs in an academic setting over a web site. First, using CMS is easier than HTML, saving the teacher and student time and encouraging even novice web users to post their ideas. Second, blogs use templates, many of which are available for download from the web and present a professional image. Third, bloggers may post as often as they like; the same cannot be said for personal web pages. Fourth, spam filters do not block blogs because they are not considered an email communication. Finally, blogs are available on just about any subject; it may be impossible to determine exactly how many bog sites there are, but Blog Flux, for example, is currently featuring 137,198 blogs in their directory.

Providing a technological basis for blended learning lessons, blogs offer numerous benefits including student motivation, especially for those who otherwise might not become participants in classrooms. Blogs provide excellent opportunities to practice reading and writing. They are effective forums for collaboration and discussion. And, they are powerful tools to promote cognitive development. As an educational tool, blogs may be used to accommodate all style of learners. They can serve as a vehicle to foster a community of learners or serve as the host for student demonstration of learning. Regardless of the application, the imagination of teachers and their students define the only limitations to the creative use of such web-based technology in the classroom.

**eBooks.** Electronic books, or e-books, are mobile devices that resemble an ultra-portable computer. They were meant to approximate the size of a standard paperback book with the convenience of storage and display of a hard-copy text. E-books offer a range of features that make them suitable for inclusion in a blended learning lesson. For example, they are intuitive to the learner; with less than 15 minutes of familiarization, most learners grasp the operation of an eBook. They store large amounts of material and high-quality backlit screens make for comfortable viewing in most lighting situations.

Compared to other standard storage media such as CDROMs, e-books are easier to use and transport. eBooks offer additional features including, hyperlinks, adjustable fonts for the visually impaired, text search capabilities, and a customized table of content. eBooks are expected to offer advanced multimedia capabilities as animation, video, audio, translations, and pronunciation guides in the future.

Eric J. Simon (2001) conducted a pilot study in which e-books were loaned to college students. During the semester, 22 participants in an introductory biology course volunteered to use e-books as their sole source of reading material for the course. His survey uncovered several trends that make using eBooks well suitable for some blended learning lessons.

**Streaming Audio and Streaming Video.** “Streaming” refers to a file format and software that permits extended audio or video files to be played simultaneously during the download of the entire file. Today’s
audio (and certainly video) files encompass megabytes of space and, depending on the target computer, may take from several minutes to hours to download. Typically, streaming technologies allow for 15 to 30-second downloads of the file to be captured to a buffer before the media begins to play. As the play continues, the buffer continues to accept downloaded content remaining just ahead of the materials being played and giving the appearance of continuous, uninterrupted play in the most seamless of virtual conditions.

Using application software such as Real Audio, for example, students are able to play most audio and video almost immediately. The software is also able to capture the entire stream for later should the network connection be unable to provide uninterrupted play (i.e., the buffer available is too small or the network connection too slow). A well thought out audio or video stream can store files up to 40 times smaller that other formats, making them quicker to download and requiring less disk space for storage.

Streaming audio and video is popular in a blended learning environment because of the breadth of possible applications. For example, streams are useful as samples; short sound snippets or video clips can be used to help pronunciations in a language class or a view of a complex step in a scientific biology experiment. Many schools already provide classroom lectures in streaming format; usually audio, but video is becoming more popular. Streamed lectures are valuable tools for learners who need additional time to absorb the content of the presentation, missed a class for whatever reason, or prefer to listen to a captured lecture in preparation for an upcoming examination.

**Slideshows (narrated).** Somewhat akin to streaming audio and video in terms of its contributions to blended learning is the narrated slideshow. The major advantage of this technology is the simplicity with regards technical competencies needed to produce such a resource. Considered very useful in face-to-face settings, slide presentations are often less effective when used in a blended learning environment – particularly one that is primarily online. Either the simple slideshow contains insufficient information or it is too cumbersome (i.e., slow) to access.

When creating effective online slideshow presentations, teachers have a powerful tool to assist them in their efforts: narrated slides. This technology is not merely about an instructor reading directly from the slides. Rather, a narrated slideshow makes the learner feel that the instructor is talking directly to them by speaking in an informal manner; for example, many such presentations are narrated without a script. The goal is to make students feel as though they were actually sitting in the classroom with the instructor listening to a face-to-face lecture.

There are several options for creating a narrated presentation – some more practical than others. First, teachers can actually record a narration onto their PowerPoint presentation by using the “slide show” menu and “record narration” to each slide. Students are able to hear the narration as they move through the presentation at their own speed. However, PowerPoint files can be large when narration is included. Teachers must consider the delivery format before deciding on this option for producing a narrated slideshow.

Other software packages have been expressly developed to convert PowerPoint presentations into Flash-based slideshows. Articulate Presenter is one example of a package that provides learners with high-quality presentations even when beginning with a simply PowerPoint lesson. A file converted using this package is considerably smaller in size and therefore much faster to download.

*RealPresenter*, by Real Networks, allows an instructor to enhance his or her PowerPoint presentations by being able to add audio to the slide shows. By incorporating voice-over narration into their online presentations, instructors may now add an audio component to complement their slides’ visuals and the
text. When completed, the file format of such presentations may then be compressed for delivery across an online setting.

**Impatica** for PowerPoint also converts PowerPoint presentations; however, this package converts the slides into a web-based presentation optimized for viewing on any web browser (Internet Explorer, Netscape, Firefox, etc.). These slideshows play equally well over any Internet connection and any connection speed. Perhaps most importantly, presentations using Impatica do not require any special plug-ins before viewing – a common stumbling block for many novice online learners.

**Virtual Tours.** Finally, under the general heading of asynchronous tools for blended learning is the web-based virtual tour. A virtual tour is a web-based teaching strategy which presents multi-sensory, multimedia instructional appropriate for student exploration and group learning experiences (Tomei, 2001).

A virtual tour consists of several important components including: introduction, lesson objectives, timelines for the lesson, and instructions. In addition to infusing text hyperlinks, the virtual tour will include image hyperlinks, animated graphics, sound and video files, and a self-assessment tool to measure progress toward achieving mastery of the assigned learning goals. The incorporation of all these features into asynchronous learning is an ideal match for blended learning lessons.

**Synchronous Learning**

Historically, traditional educational learning environments (K-12, higher education, corporate, etc.) have been based on the transfer of knowledge from expert (teacher or trainer) to learner (student or employee) by means of lectures or training sessions. Mostly, this transfer was advanced by text books and face-to-face presentations. The classroom has been the location for learning from time immemorial; that is, until the virtual classroom became a reality.

In both traditional and online classrooms, synchronous learning describes the various forms of communications that occur at the same time between individuals while, at the same time, accessing information instantly. Teachers communicate with learners in real time using technologies that were once only imagined in the movies and comic books. Computers host discussions with two participants on separate continents. Presentations integrate electronic whiteboards and electronic slides under the control of the instructor who might physically be located miles from the classroom.

There are several advantages to synchronous delivery. For example, synchronous tools focus the group on the tasks at hand. They create a community of learners and classroom cohesion. Rapid feedback inherent in synchronous communication fosters consensus-building in classroom exercises. Finally, many of the tools discussed in this section share the common characteristic of lesson control; using these tools allows the instructor stronger influence over the sequence and velocity of the instruction.

For the instructor, it remains imperative that every effort is expended to overcome the few (but critically important) disadvantages of asynchronous learning. Research has found that students often feel isolated or less motivated without the face-to-face time human interaction of the traditional classroom (Woodfine, Baptista-Nunes, and Wright, 2006; Park & Bonk, 2007). In addition, asynchronous e-learning does not provide immediate feedback on a student’s performance, leaving adjustments to training until after a subsequent evaluation is completed (Slack, Beer, Armitt, and Green 2003).
Synchronous Technologies

Teachers who include synchronous, computer-mediated communication in their instruction increase student participation, motivate their charges with respect to learning (especially self-directed learning), and give their learners a higher level of comfort and confidence both inside and outside the classroom (Wang, 2008 and Kadirire, 2007). The following synchronous technologies have the best chance for application in a blended learning environment.

**Tele-Presence Technologies.** Under the general classification of synchronous tele-presence teaching comes audio, video, and web conferencing. Audio conferencing solutions provide an easy and cost-effective way to deliver instruction via telephone with a geographically separated group of learners. Audio conferences, whether traditional or voice-over internet protocol (VoIP) can be a cost-effective complement to face-to-face classroom meetings. Teachers can quickly set up and manage virtual meetings from any telephone with better communication and collaboration along with significant cost savings advantages.

When properly implemented, video conferencing provides valuable delivery alternatives to educators. There are two key factors when considering video conferencing for teaching. The number of students in the classroom, number of locations participating in the conference simultaneously, facility configuration, and the experience of the instructor with regards teaching with technology all play into the learning environment in which the video conferencing will take place. From a technical perspective, users of video must consider bandwidth speeds, compatibility and availability of equipment, and network reliability. In the early to mid-1990’s, technical issues (e.g., the use of ISDN lines versus the Internet) made the use of video conferencing temperamental at best. Today’s technology makes video one of the best delivery modalities for physically separated learners.

Web conferencing is perhaps the best of the best with regards to tele-presence instruction, combining equipment, software, and networking to reach new levels of delivery excellence for educators. Internet-based instruction gives educational institutions of all sizes state-of-the-art tools to conduct synchronous sessions in an environment that is affordable, easy to manage, and if needed, secure.

Offering and delivering effective audio, video, and web-based conferencing classes require a good deal of preparation on the part of the instructor. Visual materials should be organized and distributed to students prior to the session to allow the student to preview the material and address any confusing agenda items. Materials are distributed electronically using the document-sharing features of a learning management system, attachments from an instructor’s email, or electronic media such as a CD-ROM. Instructors should provide clear instructions for the session and discuss protocols for interaction in preliminary communications before (or, if necessary, as an initial introduction during) the first online session.

Seasoned tele-presence instructors suggest that the use of synchronous conferencing forced them to re-evaluate (and thereby improve) their teaching practice (Hinger, Date Unknown). Conference-based classes allowed them to draw on many of the teaching skills they would use in a normal classroom while offering their students all the advantages of a distance education. Some of the most affected changes in teaching styles included the need to limit lecture time, incorporate interactive learning experiences, advance engagement learning opportunities, prior preparation using asynchronous tools, additional lead time to prepare conference class, and others. Honing one’s course preparation techniques were mandatory and included such skills as ensuring the technology is ready; identifying a qualified educational
technologist in case of emergencies; planning learning strategies and outcomes well in advance; ensuring appropriate design and integration of online tools based on accepted models of instruction, and more.

**Online chat rooms.** Chat rooms provide an online forum for synchronous discussions of pertinent lesson content. Most chat rooms are fully integrated into existing learning management systems, affording users a secure login with built-in tracking and assessment. Channels are provided to control the topics under discussion and archive participant comments. Other common features include text formatting options, private chats, emoticons, sounds, avatars, pop-up windows, and online help as well as enhanced security features such as banning visitors, ignoring users, and profanity filters.

Online chat rooms have perhaps more advantages and disadvantages than most other synchronous tools. On the plus side, students are more inclined to participate since the setting is less formal and most students are already familiar with the protocols and etiquette of a chat session. Chat rooms typically flex a learner’s writing prowess (always a plus in today’s audio and video-rich world) giving the student ample opportunity to craft their ideas in a more studious product often not possible during face-to-face classroom discussions.

In a properly monitored chat room, students are able to share their ideas with peers in their own class, other classes studying the same content, and even other students from around the world who share the same interests – all in a safe and non-harassing environment.

On the down side, chat rooms have certain limitations that must be considered and overcome. For example, chats represent poor pedagogy when it involves more than a handful of participants or when the instructor functions as a didactic lecturer delivering content and avoiding interactive conversation. And, of course, the chat room is notorious for online predators, identity thief’s, spammers, and viruses.

**Interactive Whiteboards.** The interactive whiteboard is an often misunderstood technology. Some vendors, in particular, advertise their whiteboard as a peripheral device connected to an instructor’s computer that offers electronically all the familiar features of a traditional classroom blackboard or ordinary whiteboard. Other suppliers refer to a whiteboard that is internal to a learning management system (commercially, this feature is often called an eBoard). In the online version of the whiteboard, an image window provides the online instructor with a drawing palette, file import, screen save, file-sharing, web page projections, and more.

Let’s talk the peripheral whiteboard first. A whiteboard is touch sensitive, connected to a projector, computer, DVD, VCR, and other devices. Instructors control the images from a podium usually located at the front of the classroom. Using this device, the instructor projects digital as well as physical presentations, interact with the computer using a digital pen that displays virtual “ink,” and captures the notes and images to a digital lesson file.

The eBoard has all the same features, more or less. The major exception is the use of the interactive technology as part of an online course. The software available with the whiteboard can take any virtual writing and transform it to printed text. The entire lesson, as it is unfolded before the eyes of the online learner, can be printed, saved, loaded online, e-mailed, or shared via a host of other ways to share with students who seek to use the material either for remedial work, preparation of an assessment, or as a primary source of content for a lesson they might have missed.

There are numerous advantages to using interactive whiteboards, regardless of the type. Whiteboards work well with large groups; rather than crowding around a single computer screen, students can comfortably view the instructor’s presentation. Any presentation or lesson is easily enhanced with integrated video, animation, graphics, text and audio. Resources from a number of venues such as CD-ROMs, websites, DVDs, VHS tapes and television are possible. The instructor is able to manage information
directly during lessons and save changes or additions to a digital file. Students benefit from the interaction with the whiteboard; collaboration is enhanced, engagement is fostered, and peer-to-peer interaction within groups is promoted.

**Application sharing.** Application sharing allows instructors and students to share software or any part of the instructor’s desktop. The host of the application (usually the teacher) grants remote control of the application(s) for purposes of simulated experiences, practical training, real-world demonstrations, or, in some cases, hands-on technical support. Participants see the screen-view of the shared application. Their coordinated mouse and keyboard movements enable collaborative work, software tutoring and e-synchronous learning. There is only one copy of the shared application running from a main server. As a result, institutions save money by avoiding purchases of multiple copies of the software and prevail over privacy and security issues. The main challenges of application and desktop sharing are scalability, reliability, true application sharing, operating system independence, and performance.

There are two models for application sharing: application-specific and generic. The application-specific model requires the developers to add this feature to their applications; for example, the latest version of Microsoft Office includes application sharing as a key feature. In the generic model, applications include word processors, Internet browsers, Power Point presentations, and others.

Application sharing refers to simultaneous access by two or more to a common application, document file, or video screen from different locations. Most application sharing programs offer the instructor a software interface that opens the program or document using a username and password for security. Once the program is available, the instructor takes control of the session (remember, this is a synchronous technology) and invites students into the application sharing session. Features allow the instructor to relegate control of the program to the learner who can modify, manipulate, edit, or apply the program.

Some application sharing software permits two or more users to edit a document or application simultaneously, encouraging true synchronous activity. Instructors are able to demonstrate complicated applications in real time and coach their students through otherwise complicated applications. Using application sharing activities in a blended learning environment helps to create a true sense of community among students and instructors.

**CONCLUSION**

Blended learning is a mix of traditional classroom environment with distance learning components; in effect, it is the systematic combination of delivery procedures for the classroom. Blended learning is most successful when teachers are trained in face-to-face didactic instruction, group processes, and the technology. All three components of blended learning must interact to produce effective instruction.

For many schools and corporate training organizations, blended learning is replacing distance learning. Research by Bersin & Associates (2003) found that blended learning programs are perhaps the highest impact, lowest cost way to drive major corporate initiatives. Blended learning addresses the issues of speed, scale, and impact while offering the instructor an alternative to distance learning when distance learning has been shown not to be the most effective instructional delivery media for some learners.

Each delivery format has its own particular strengths and weaknesses. Technology offers online course management systems; audio, video, and web-based tele-presence; CDROM-based courses, etc. Face-to-face instruction submits text books, group discussion, Power Point presentations, and more. Collectively, blended learning capitalizes on the strengths and minimizes the weaknesses of each modality.
Blended learning forces you to think about the instructional goals. Together with instructional design models such as the ADDIE Model, Kemp Model, or the Dick & Carrey Model, teachers can use blended learning to more closely analyze the needs and constraints of the learner; design the best recipe of learning activities, assessment tools, and media; develop the instructional resources; implement the lesson; and, evaluate the results from all perspectives.

Finally, as the reader of this text will witness is the remaining chapters of the book, blended learning has less impact on the organization’s budget. By combining the technologies addressed above with traditional face-to-face instruction, the tradeoff between development cost and delivery cost is minimized. Most teachers can build their own instructional content following a few in-service training sessions on the principles of blended learning and the application of technology.

Use *ICTs for Modern Educational and Instructional Advancement: New Approaches to Teaching* to set the stage for an evolution in teaching by introducing teachers to the theories, principles, and applications of blended learning in your institution. The scholars who have contributed to this book have already found success in using the technologies discussed to enhance their own teaching. Take advantage of their lessons learned.

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**REFERENCES**


