

BLENDED LEARNING

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By

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PREFACE

As blended learning emerges as perhaps the most prominent delivery mechanism in higher education, business, government and military settings, it is vital to define it, as well as explain where it is useful and why it is important. The author discusses the elements that are important to consider in blended learning while also touching on some of the emerging trends and issues.

In *Unit One*, describes the historical emergence of blended learning as the convergence between traditional face-to-face learning environments and computer-mediated learning environments. He discusses four critical dimensions to interactions that occur in both of these environments (space, time, fidelity and humanness) and presents a working definition for blended learning systems.

In *Unit Two* Theories of 'Blended Learning' a brief and provocative perspective on blended learning. The central theme of his Unit is that all great learning is blended. In the pre-digital age, combinations of different learning contexts were used. Similarly, learning environments increasingly will incorporate "e-elements" into varied instructional contexts.

In *Unit Three*, Classification of Blended Learning, several type of challenges facing those who are attempting to implement blended solutions. The design a blended program from scratch, putting too much emphasis on the "live" components of a training situation and assuming that traditional facilitators are the best choices for managing a blended version of the training.

In *Unit Four* Blended Learning and selecting the best Instructional Method used in commercial practice: Allows the dissemination of unpublished material and learners to have access to peers and experts. Group discussion and practice can be engaging and add additional interest in a topic. Traditional classroom learning complements learners with certain learning preferences (those who depend upon highly teacher-centered

methods) and is a good method for “people” people. It also provides gradual development of complex or difficult concepts and theories.

In *Unit Five* Strategies on how ‘Blended Learning’ can be integrated within traditional shares a vision for the next generation of blended learning. She addresses the impact that personal and mobile devices are likely to have on emerging models of blended learning and suggests that interaction strategies offer a useful means for enhancing individualization, personalization and relevancy. She discusses current models of interaction and shares eleven ways that interaction can be used to focus on performance outcomes.

In *Unit Six* Blended Learning Used in Commercial Practice the most common understanding of blended learning is the integrated combination of traditional learning with web-based online approaches. Also the understanding of blended learning as the combination of media and tools employed in an e-learning environment is often in use while others interpret it as the combination of a number of pedagogical approaches, irrespective of learning technology in use.

In *Unit Seven* The Benefits of A Blended Learning Approach, supports these aims by providing online collaborative spaces, tools and digital resources in a state of the art 21st century learning environment that enhance the physical classroom. This provides opportunities for students, parents and educators to share information collaborate and engage in learning in a secure space. The blended learning provides seamless asynchronous and synchronous e-Learning environments to all schools and colleges. There is a growing world wide trend in initiatives that are explicit about the availability of learning anywhere, anytime. The underpinning notion is that teachers will need to be up skilled quickly to cope with the virtual learning opportunities in the classroom.

This book mainly in the view of Kg to PG level and Industry where ever “Teaching, Learning and Training” is required to Parents, Teachers, teacher educators and professionals especially in the field of education the book very useful.

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Parameter Individual Description

1. Mode –focus on mode Distribution mode
Choice of modes
2. Model of integration-sequencing Level of integration
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3. Distruction of learning content and Use of teaching
methods employed objectives and setting aims

4. Language Teaching Methods Use of teaching methods in each of the models employed
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ABOUT THE BOOK

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UNIT-1

Introduction to Blended Learning Systems

*"For the things we have to learn before we can do them,
we learn by doing them"*

-Aristotle

Blended learning is not a new concept. It initiates from commercial training and development in the United State of America and is assumed to have made its first appearance in the late 1990s. Blended learning has become a buzzword and has grown increasingly in demand and popularity in corporate as well as academic settings. It has been mostly researched across the globe in the educational circle over the past couples of years. However, the term of blended learning has been defined differently since its birth and its meaning has been changing with time. Many educationist define it as a combination of two pedagogical approaches, in our view, with their focus merely on the superficial level while few have had it defined like Singh & Reed do as "optimizing achievement of learning objectives by applying the right learning technologies to match the right personal learning style to transfer the right skills to the right person at the right time", which we believe goes beyond the superficial form and goes through the essence of blended learning. In blended learning design, "five key ingredients" are known to be involved in a blended learning process. However, when we design a blended learning curriculum, we still have no clue to the way how such design can be produced. As blended learning has been practiced across various disciplines at various levels of educational institutions and in various part of the globe, little has been done in establishing a theoretical framework which is used to guide blended learning curriculum design and believed to be highly

desirable to ensure effective blended learning. This paper attempts to make just such an endeavor, with the hope of laying a theoretical foundation for blended learning curriculum design.

Current Trends and Future Directions

The term blended learning is being used with increased frequency in both academic and corporate circles. In 2003, the American Society for Training and Development identified blended learning as one of the top ten trends to emerge in the knowledge delivery industry (Rooney, 2003). In 2002, the Chronicle of Higher Education quoted the President of Pennsylvania State University as saying that the convergence between online and residential instruction was "the single-greatest unrecognized trend in higher education today" (Young, 2002, p. A33). Also quoted in that article was the editor of the *Journal of Asynchronous Learning Networks*, who predicted a dramatic increase in the number of hybrid (that is, blended) courses in higher education, possibly to include as many as 80 to 90 percent of all courses (Young, 2002).

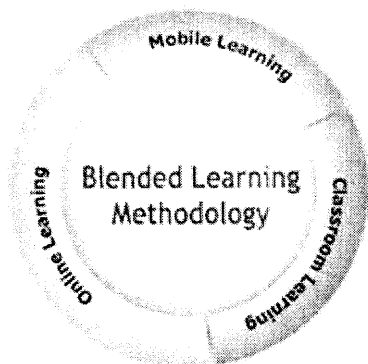
So what is this blended learning that everyone is talking about? This Unit provides a basic introduction to blended learning systems and shares some trends and issues that are highly relevant to those who are implementing such systems. To accomplish these goals, the Unit addresses five important questions related to blended learning systems:

1. What is blended learning?
2. Why blend?
3. What current blended learning models exist?
4. What issues and challenges are faced when blending?
5. What are the future directions of blended learning systems?

Background and Definitions

The first question asked by most people when hearing about blended learning is, "What is blended learning?" Although blended learning has become somewhat of a buzzword in

corporate and higher education settings, there is still quite a bit of ambiguity about what it means. How is blended learning different from other terms in our vernacular, such as distributed learning, e-learning, open and flexible learning and hybrid courses? Some define the term so broadly that one would be hard pressed to find any learning system that was not blended. Others challenge the very assumptions behind blending as holding on to relics of an old paradigm of learning. In the first section of this Unit, I articulate a practical working definition for the term blended learning and provide a historical context for its emergence.



There are brick and mortar options, such as coaching, classes and mentoring. Then there are electronic options, ranging from e-learning classes, to on-line help systems, to templates, decision support tools and knowledge bases. E-learning gurus Elliot Maisie and Brandon Hall recognize the many options and encourages combined systems, which they call 'brick and click,' or 'blended' learning" (Rossett & Sheldon, 2001, p. 281). Most definitions of blended learning follow the concept that it is a blended solution between e-learning (on-line or click) and classroom learning (face-to-face or brick): Blended Learning can combine the positive aspects of the two learning environments, classroom-based learning and e-Learning (Bonk & Graham, 2006). However, some experts are now taking a broader view in that it goes beyond e-learning and classrooms: Blended learning is a mix of delivery methods that have been selected

and fashioned to accommodate the various learning needs of a diverse audience in a variety of subjects. This method can include any combination of any of the above delivery methods (McSporran & King 2002).

Thus, Blended Learning is the use of two or more distinct methods of training. This may include combinations such as :

1. Blending classroom instruction with on-line instruction
2. Blending on-line instruction with access to a coach or faculty member
3. Blending simulations with structured courses
4. Blending on-the-job training with brown bag informal sessions
5. Blending managerial coaching with e-learning activities

It was soon realized that there was a need for a common understanding of blended learning amongst all staff on the course in order to deliver the material in a way that was able to fulfill the following definition: "Blended Learning is learning that is facilitated by the effective combination of different modes of delivery, models of teaching and styles of learning and is founded on transparent communication amongst all parties involved with a course." (Heinze and Procter, 2004, p.12) The Department for Education and Skills (2003), *for example*, recently provided the following definition: "If someone is learning in a way that uses information and communication technologies, they are using e-learning. They could be a pre-school child playing an interactive game; they could be a group of pupils collaborating on a history project with pupils in another country via the Internet [... etc.] – it all counts as e-learning".

Elements of a Blended Learning

Allison Rossett, Professor of Educational Technology at San Diego State University, supports the situational instructional design model for "blended theory" approach. "Learning theories aren't like religion," says Rossett. "You don't have to pick Catholic or Baptist or Muslim and shun the others. The goal is to have the

right theory for the right situation.” (cited in Zemke 2002). According to Zemke the situation is dependent upon “the people you serve, the nature of the skills they must master and the context in which they are to perform.” Such a “situational” instructional design model fits well with the concept of blended learning. By applying learning theories of Keller, Gagné, Bloom, Merrill, Clark and Gery, there are five key ingredients emerge as important elements of a blended learning :

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-assessments 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.

Characteristics of Blended Learning

1. In general, it has three characteristics. The first one is flexibility of providing learning resources. Blended learning is treated as an instructional strategy, which is developed in a networked environment. Such a strategy is usually supported by Virtual Learning Environments (VLEs), which are a computer-based standardized learning system and are used to sustain content delivery of online learning as well as to encourage online communication between an instructor and learners. Many studies show that with the medium of VLEs, the three most common uses

in blended learning are providing course information, supplementing on-campus studies as well as accessing Internet resources. It can help diversify the provision of learning resources through BBS, E-mail and other functions. Salutation scopus. 2. The second is support of learning diversity. As learners are varied in terms of learning styles, learning proficiency, as well as learning ability, blended learning can come to the liberate by making it possible for individualized learning and self-regulated learning to happen. Teachers can use combined approaches to cater for the needs of the diverse student body and to create an opportunity to make everyone s learning an equally successful experience. The third is enrichment of e-learning experience on campus. From the faculty s perspective, blended learning can enable them to improve their existing teaching practices. Now-a-days, it is usual to ask students to submit their weekly assignments by the paper, but now we ask them to submit their work by email and then we evaluate their performance by e-Portfolios. One more specific example, we used to teach students with the typically teacher-centered approach, but now individualized learning is no longer a rarely seen phenomenon. Learning systems also help teachers to reduce the burden of calculating the marks of the papers, for the systems can do the whole trick automatically. 3. From the learners perspective, learning has become rights of their own, which they can make own decisions on what they do each day and what they are going to achieve by certain deadlines for the same goal and how they are going to achieve them. Moreover, learning anytime and anywhere has become a reality. From the administrators perspective, tons of paper work has been replaced by limited e-work. Educational administration brought about by blended learning has become as easy as mouse-clicking.

The Blended Learning Procedure

There are four main components in the blended learning procedure: (1) Lead-in; (2) Planning; (3) Acting; and (4) Reviewing.

1. *lead-in* : It is the preparatory point of the activity. The most important objective is to demonstrate the task to learners. In this component, there are four

sub-components, which are: (1) describe aims of the task; (2) show the task by examples; (3) show resources provided; and (4) make arrangements. The first one is intended for students to have an idea what they are expected to achieve after completion of the task. The second is meant to let students have a better understanding of the task. The third is set to provide students with resources that they can use to complete the task. The last is to make instructional arrangements, which are mainly referred to as the general planning for how this course will be carried on through the whole semester.

2. *Planning* : The objective of this component is to define the task by learners themselves through using their knowledge. There are three subcomponents, which are: (1) brainstorm if in groups; (2) define the problem; and (3) identify the factors or aspects or define the steps. If learners work in groups, they may be required to work out various issues related to the given problem and to define the steps that you can follow to deal with the problem.
3. *Acting*: The objective is to deal with an actual task or problem by completing task-related requirements. This component distinguishes itself from other components by interacting with VLEs. It has three subcomponents: (1) collect more information if needed; (2) carry on the task or solve the problem; and (3) write reports. Through interacting with VLEs, learners are able to acquire needed information and support from both their peers and their instructor.
4. *Reviewing*: The objective is to have newly constructed knowledge transferred to learners future learning through sharing their work with their peers and the instructor. This component encompasses the following three subcomponents: (1) make presentations or distribute the reports online; (2) review the process; and (3) receive feedback from instructor. The first one is a kind of "show and tell". Students may be expected to make presentations or display their work online in VLEs.

The second is a kind of self-reflection process, where they can compare their own work with their peers and review their own work to see how well they have done their job. The third is how their work is evaluated by their peers and the instructor so that they are informed of how well they have done their work and where they are expected to improve in terms of knowledge construction and learning strategies.

Why is Blended Learning

"People are not single-method learners!" Says e-learning guru Elliott Masie (cited in Rossett, 2002). Indeed, while specific "blended" offerings differ, industry consensus continues to point to the use of multiple modalities for learning. Masie puts it simply: "We are, as a species, blended learners." The advantage of blended learning in education is its connection with differentiated instruction. Differentiated instruction involves "custom-designing instruction based on student needs." In differentiated instruction, educators look at students' learning styles, interests and abilities. Once these factors have been determined, educators decide which curriculum content, learning activities, products and learning environments will best serve those individual students' needs. Blended learning can fit into a number of these areas. By using blended learning, educators are definitely altering the learning environment when students work collaboratively in learning communities online, *for example*. Teachers could also add relevant curriculum content that would be unavailable or difficult to comprehend outside of the internet. Learning activities and products can also be changed to use technologies in a classroom that uses blended learning.

In a study by Dean and associates, research showed that providing several online options in addition to traditional classroom training actually increased what students learned. Another study showed that student interaction and satisfaction improved, along with students learning more, in courses that incorporated blended learning. (DeLacey and Leonard, 2002) Another advantage of blended learning is pacing and attendance. In most blended learning classrooms, there is the ability to study whenever the student chooses to do so. If a

student is absent, she/he may view some of the missed materials at the same time that the rest of the class does, even though the student cannot be physically in the classroom. This helps students stay on track and not fall behind, which is especially helpful for students with prolonged sicknesses or injuries that prevent them from attending school. These “self-study modules” also allow learners to review certain content at any time for help in understanding a concept or to work ahead for those students who learn at a faster pace. (Alvarez, 2005) Because of the ability of students to self-pace, there is a higher completion rate for students in blended learning classrooms than to those in strictly e-learning situations. (Flavin, 2001) This self-pacing allows for the engagement of every learner in the classroom at any given time. Students also see that the learning involved becomes a process, not individual learning events. This revelation allows for an increased application of the learning done in the classroom. (Flavin, 2001)

What Is Being Blended?

The three most commonly mentioned definitions, documented by Graham, Allen and Ure (2003), 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)
- (c) Combining online and face-to-face instruction (Reay, 2001; Rooney, 2003; Sands, 2002; Ward & LaBranche, 2003; Young, 2002)

The first two on the influences of media versus method on learning (Clark, 1983, 1994a, 1994b; Kozma, 1991, 1994). Both of these positions suffer from the problem that they define BL so broadly that they encompass virtually all learning systems. One would be hard-pressed to find any learning system that did not involve multiple instructional methods and multiple delivery media. So defining BL in either of these two ways

waters down the definition and does not get at the essence of what blended learning is and why it is exciting to so many people. The third position more accurately reflects the historical emergence of blended learning systems and is the foundation of the author's working definition.

Blended Learning Systems

Blended learning systems combine face-to-face instruction with computer-mediated instruction.

Bended Learning is the combination of instruction from two historically separate models of teaching and learning: Traditional face-to-face learning systems and distributed learning systems. It also emphasizes the central role of computer-based technologies in blended learning.

Past, Present and Future

Blended Learning is part of the ongoing convergence of two archetypal learning environments. On the one hand, we have the traditional face-to-face learning environment that has been around for centuries. On the other hand, we have distributed learning environments that have begun to grow and expand in exponential ways as new technologies have expanded the possibilities for distributed communication and interaction.

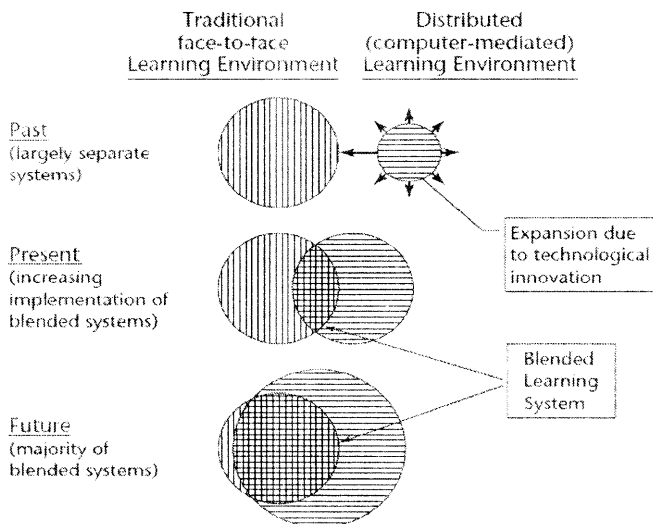
In the past, these two learning environments have remained largely separate because they have used different media and method combinations and have addressed the needs of different audiences. *For example*, traditional face-to-face learning typically occurred in a teacher-directed environment with person-to-person interaction in a live synchronous, high-fidelity environment. On the other hand, distance learning systems emphasized self-paced learning and learning materials interactions that typically occurred in an asynchronous, low-fidelity (text only) environment.

The continuum for four critical dimensions of interactions that occur in both of these environments. Historically, face-to-face learning has operated at the left-hand side of each of these dimensions and distributed learning has operated at the right

of each of these dimensions. To a large degree, the media available placed constraints on the nature of the instructional methods that could be used in each environment. *For example*, it was not possible to have synchronous or high-fidelity interactions in the distributed environment. Because of these constraints, distributed learning environments placed emphasis on learner material interactions, while face-to-face learning environments tended to place priority on the human-human interaction.

The rapid emergence of technological innovations over the past half-century (particularly digital technologies) has had a huge impact on the possibilities for learning in the distributed environment. In fact, if you look at the four dimensions, distributed learning environments are increasingly encroaching on instructional territory that was once possible only in face-to-face environments. *For example*, in the time and fidelity dimensions, communication technologies now allow us to have synchronous distributed interactions that occur in real time with close to the same levels of fidelity as in the face-to-face environment. In the humanness dimension, there is an increasing focus on facilitating human interaction in the form of computer-supported collaboration, virtual communities, instant messaging and blogging. In addition, there is ongoing research investigating how to make machines and computer interfaces more social and human (the work with automated agents and virtual worlds, *for example*). Even in the space dimension, there are some interesting things happening with mixed reality environments and environments that Blended learning both distributed and face-to-face interactions. The widespread adoption and availability of digital learning technologies has led to increased levels of integration of computer-mediated instructional elements into the traditional face-to-face learning experience. From the distributed learning perspective, we see evidence of the convergence in face-to-face residency requirements and limited face-to-face events, such as orientations and final presentations. In addition, there is greater emphasis on person-to-person interaction and increasing use of synchronous and high-fidelity technologies to mediate those interactions.

Traditional Face-to-Face and Distributed Environments Allowing Development of Development of Blended Learning Systems



Charles R.Graham (2005) The Handbook of Blended Learning,p-6/www.graham_intro.pdf

The rapid growth of distributed learning environments and its convergence with face-to-face learning environments. The intersection of the two archetypes depicts where blended learning systems are emerging.

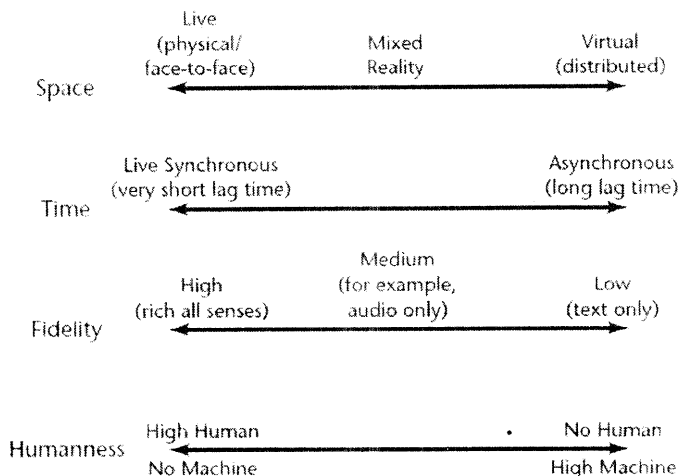
Although it is impossible to see entirely what the future holds, we can be pretty certain that the trend toward blended learning systems will increase. It may even become so ubiquitous that we will eventually drop the word blended and just call it learning, as both Masie and Massy predict. But regardless of what we decide to call blended

Learning Environments

Learning in the future, it is clear that it is here to stay. Therefore, it is imperative that we understand how to create effective blended

learning experiences that incorporate both face-to-face and Computer Mediated (CM) elements.

Four Dimensions of Face-to-Face and Distributed



Current Trends and Issues

Here we look at current trends and issues that are relevant to blended learning systems.

Why Blend?

There are many reasons that an instructor, trainer, or learner might pick blended learning over other learning options. Osguthorpe and Graham (2003) identified six reasons that one might choose to design or use a blended learning system :

- (1) Pedagogical richness,
- (2) Access to knowledge,
- (3) Social interaction,
- (4) Personal agency,
- (5) Cost-effectiveness and
- (6) Ease of revision.

In the Blended Learning literature, the most common reason provided is that Blended Learning combines the best of both worlds. Although there is some truth to this, it is rarely acknowledged that a blended learning environment can also mix the least effective elements of both worlds if it is not designed well. Beyond this general statement, Graham, Allen and Ure (2003, 2005) found that, overwhelmingly, people chose Blended Learning for three reasons: (1) improved pedagogy, (2) increased access and flexibility and (3) increased cost-effectiveness.

Improved Pedagogy

One of the most important reasons for blending are more effective pedagogical practices. It is no secret that most current teaching and learning practice in education system and corporate training settings is still focused on transmissive rather than interactive strategies. In higher education, 83 percent of instructors use the lecture as the pre-dominant teaching strategy (U.S. Department of Education, 2001). Similarly, distance education often suffers from making large amounts of information available for students to absorb independently (Waddoups & Howell, 2002). Some have seen blended learning approaches increase the level of active learning strategies, peer-to-peer learning strategies and learner-centered strategies used (Collis, Bruijstens & van der Veen, 2003; Hartman, Dziuban & Moskal, 1999; Morgan, 2002; Smelser, 2002). There are many examples of this in this unit, including the model used by IBM where learners go through three phases: (1) online self-paced learning to acquire background information, (2) face-to-face learning lab focused on active learning and application experiences instead of lecture and (3) online learning and support for transferring the learning to the workplace environment.

Brigham Young University accounting professor uses online modules to help students acquire the tool-related skills and technical information and then uses precious face-to-face class time to focus on application, case studies and develop decision-making skills (Cottrell & Robison, 2003). It is interesting to note

such overlaps in blended learning models between the corporate training world and higher education.

Blended Learning to improve pedagogy included in this handbook are provided by Oliver, Herrington and Reeves, who provide insights into how computer-mediated environments can bring a level of authenticity to the traditional classroom experience. Collis shares a model for how Blended Learning can be used to integrate formal classroom learning and informal workplace learning. Wisher and Kirkley and Kirkley share ideas for collaborative learning and problem solving in environments that mix live face-to-face elements with virtual reality.

Access and Flexibility

Access to learning is one of the key factors influencing the growth of distributed learning environments (Bonk, Olson, Wisher & Orvis, 2002). In this book emphasize programs that would not be possible if students were not able to have a majority of their learning experiences at a distance from instructors and/or other students. Learner flexibility and convenience are also of growing importance as more mature learners with outside commitments such as work and family seek additional education.

Many learners want the convenience offered by a distributed environment yet do not want to sacrifice the social interaction and human touch they are used to in a face-to-face classroom. There are numerous examples in this handbook of how blending is used to provide a balance between flexible learning options and the high-touch human interactive experience. Barbara Ross and Karen Gage, have seen an expansion of reduced seat-time courses that allow increased flexibility but retain some traditional face-to-face contact. The University of Central Florida's M (*i.e.*, mixed mode) courses (Dziuban, Hartman, Juge, Moskal and Sorg, Unit Fourteen, this volume) are also good examples. As a third example, the University of Phoenix model allows face-to-face socializing in orientations as well as presentation experiences at the beginning and ending of a course, with online learning experiences in between.

Cost-Effectiveness

Cost-effectiveness is a third major goal for Blended Learning systems in both education and corporate institutions. Blended learning systems provide an opportunity for reaching a large, globally dispersed audience in a short period of time with consistent, semi personal content delivery. Bersin and Associates (2003) have done an exemplary job of documenting corporate cases that have effectively used blended learning to provide a large return on investment. In higher education, there is also interest in finding solutions that are cost-effective. The Center for Academic Transformation with support from the Pew Charitable Trust recently completed a three-year grant program designed to help universities explore ways of using technology to achieve quality enhancements and cost savings simultaneously. More detailed information for each of the thirty grant redesign projects that Pew funded can be found at the grant Website (Pew, 2003). A summary of the significant role blended learning played in the various Pew projects can be found in Graham and Allen (Graham, Allen & Ure, 2003, 2005).

What Models of Blending Exist?

One of the goals of this handbook is to look broadly across many sectors to see what the current state of blended learning is and what we can learn from innovative people and organizations in this arena. This book provides a wide range of perspectives and flavors of blended learning to learn from. Although there is a wide variance in the blended learning practices that are occurring, there are also some strategic similarities that will be articulated in following section.

Blending at Many Different Levels

All of the Blended Learning at following four levels: Activity level, course level, program level, or institutional level. Blending at the institutional and program levels is often left to the discretion of the learner, while designers and instructors are more likely to take a role in prescribing the blend at the course and activity levels.

Activity-Level Blending

Blending at the activity level occurs when a learning activity contains both face-to-face and CM-Content Management elements. *For example*, Wisher outlines large-scale military training events that incorporate both face-to-face and virtual elements. Kirkley and Kirkley also discuss mixed reality technologies blend the virtual and the real together during learning activities. In higher education, Oliver, Herrington and Reeves talk about strategies for using technological tools to make learning activities more authentic, while examples like those of Jung and Suzuki share how technology is used to bring experts at a distance into the classroom, are creating a simultaneous face-to-face and CM experience.

Course-Level Blending

Course-level blending is one of the most common ways to blend. It entails a combination of distinct face-to-face and CM activities used as part of a course. Some blended approaches engage learners in different but supportive face-to-face and CM activities that overlap in time, while other approaches separate the time blocks so that they are sequenced chronologically but not overlapping. Owston, Garrison and Cook describe eight cases of blending at the course level across universities in Canada. Collis describes an approach to course-level blending for a suite of courses used by Shell EP.

Program-Level Blending

Ross and Gage observe that blends in higher education at the degree program level. Blending at a program level often entails one of two models: A model in which the participants choose a mix between face-to-face courses and online courses or one in which the combination between the two is prescribed by the program. Jung and Suzuki discuss a program-level blend in the Japan context in which there are certain face-to-face courses that are required for a program and the rest can be taken at a distance. Salmon and Lawless describe a business management certificate

Blended program that allows students the choice of completing the program completely online or online with face-to-face tutoring session or participation in an extended on-campus management challenge. The New Zealand Law Diploma program is conducted mostly online, with about 15 percent of the learning time in a face-to-face setting. Reynolds and Greiner and Wright, Dewstow, Topping and Tappenden describe teacher education programs that blend face-to-face and CM experiences at the program level.

In the corporate arena, BL is often applied to a particular training program, as was the case with Oracle's Leader Track training, Avaya's Executive Solutions Selling Business Acumen program (Chute, Williams and Hancock, Unit Eight, this volume) and cases of three training programs provided by Microsoft (Ziob and Mosher, Unit Seven, this volume).

Institutional-Level Blending

Some of the institutions have made an organizational commitment to blending face-to-face and CM instruction. Many corporations as well as institutions of higher education are creating models for blending at an institutional level. The University of Phoenix also has an institutional model for blending, where students have face-to-face classes at the beginning and end of the course, with online activities in between. At a university level, the University of Central Florida has created the "M course" designation for blended courses that have some reduction in face-to-face seat time.

Other institutions, such as Brigham Young University (BYU) Idaho, have a general education requirement that students must have one online learning course experience to graduate (BYU-Idaho, 2004). Brigham Young University (Provo campus) has experimented with "semester online" courses where on campus students can enroll for a distributed course along with other campus based courses (Waddoups & Howell, 2002). Similarly, at the University of Illinois, traditional on-campus economics students have been allowed to take a required course online while they were off-campus for the summer (Wang, Kanfer, Hinn & Arvan, 2001).

Dual-mode institutions (Rumble, 1992) that support both face-to-face and CM instruction are not necessarily in the business of blending learning. For the institution to be engaged in blended learning there must be a concerted effort to enable the learner to take advantage of both ends of the spectrum. It is not sufficient for the institution to have a distance learning division that is largely separate from the on-campus operations.

General Categories of Blends

The University of Phoenix (Lindquist, Unit Sixteen, this volume), which attempts to provide an “equivalent” learning experience through its face-to-face residential programs, entirely online programs and blended learning programs. In this system, learners pick the option that best meets their cost and time constraints.

Categories of Blended Learning Systems

1. <i>Enabling blends</i>	Primarily focus on addressing issues of access and convenience—for example, blends that are intended to provide additional flexibility to the learners or blends that attempt to provide the same opportunities or learning experience but through a different modality.
2. <i>Enhancing blends</i>	Allow incremental changes to the pedagogy but do not radically change the way teaching and learning occur. This can occur at both ends of the spectrum. For example, in a traditional face-to-face learning environment, additional resources and perhaps some supplementary materials may be included online.
3. <i>Transforming blends</i>	Blends that allow a radical transformation of the pedagogy—for example, a change from a model where learners are just receivers of information to a model where learners actively construct knowledge through dynamic interactions. These types of blends enable intellectual activity that was not practically possible without the technology.

In traditional university settings, with the widespread

adoption of Learning Management Systems (LMS) and technology-equipped classrooms, it is becoming increasingly commonplace for instructors to use some level of technology.

There seems to be a greater abundance of transforming blends in the corporate environment than in the university environment. Examples like the Live-Virtual-Constructive simulations and mixed-reality and problem-based embedded training show how high-end technologies can transform the learning experience. Other examples include the increased use of knowledge management, electronic performance support systems and mobile devices to situate learning in the context of work flow. In higher education environments, constraints such as class duration, size, location and availability of technology can provide a formidable barrier to making transformative changes. Oliver, Herrington and Reeves, for instance, point to several ways that technology can support the development of authentic learning environments. A growing number of faculties are experimenting with innovative technology-mediated approaches to teaching (such as the use of tools for simulations, visualization, communication and feedback) that are transforming the ways that their students learn (West & Graham, 2005).

What Issues or Challenges Are Faced When Blending?

Six major issues are relevant to designing blended learning systems: (1) the role of live interaction, (2) the role of learner choice and self-regulation, (3) models for support and training, (4) finding balance between innovation and production, (5) cultural adaptation and (6) dealing with the digital divide.

1. The Role of Live Interaction

Human interaction important to the learning process and to learner satisfaction observed a preference among many learners for the live (or face-to-face) components of a blended experience. When CM and face-to-face elements were combined, learners often placed a greater value or emphasis on the face-to-face aspects of

the experience. Juxtaposed to this, Offerman and Tassava make the claim that the face-to-face components are unnecessary and primarily used for socialization reasons.

The University of Phoenix takes the position that the live, completely online and blended options to its courses are “equivalent” experiences to be selected based on learner preference. When and why should we be considering human interaction such as collaboration and learning communities? How does live interaction versus low-fidelity, asynchronous interaction affect the learning experience?

2. The Role of Learner Choice and Self-Regulation

Learner choice blends that they participate in? Primarily selecting blended learning based on convenience and access. The type and amount of guidance that should be provided to learners in making their choices about how different blends might affect their learning experience. Online learning components often require a large amount of self-discipline on the part of the learners (Collis, Bruijstens & van der Veen, 2003). Huang and Zhou mention the challenge that many of their Chinese students have in regulating their own learning without the close guidance of an instructor. How can blended learning environments be designed to support increasing learner maturity and capabilities for self-regulation.

3. Models for Support and Training

Support and training in blended environments, including (1) increased demand on instructor time (Hartman *et. al.*, 1999; (2) providing learners with technological skills to succeed in both face-to-face and CM environments (Levine & Wake, 2000; Morgan, 2002) and (3) changing organizational culture to accept blended approaches (Hartman *et. al.*, 1999). There is also a need to provide professional development for instructors who will be teaching online and face-to-face. It is important to see more successful models of how to support a blended approach to learning from the technological infrastructure perspective as well as from the organizational (human) perspective.

Digital Divide

The divide between the information and communication technologies available to individuals and societies at different ends of the socio-economic spectrum. Yet e-learning is a strategy that might be considered for Blended Learning Systems educating the masses because of its low cost and ability to be distributed widely. But the jury is still out on whether blended learning models can be developed that are affordable and still address the needs of different populations with different socioeconomic conditions around the world.

4. Balance Between Innovation and Production

In design, there is a constant tension between innovation and production. There is a need to look to the possibilities that new technological innovations provide and, on the other hand, there is a need to be able to produce cost-effective solutions. However, due to the constantly changing nature of technology, finding an appropriate balance between innovation and production will be a constant challenge for those designing blended learning systems.

5. Cultural Adaptation

Blended approaches play in adapting materials to local audiences. Strength of e-learning is the ability to distribute uniform learning materials rapidly. Yet there is often a need for customizing the materials to the local audience to make them culturally relevant. Jagannathan and Selinger both address the need to find balance between global and local interests. Selinger suggests that a face-to-face instructor plays an important role in helping to make globally distributed materials culturally relevant and meaningful.

Directions for the Future

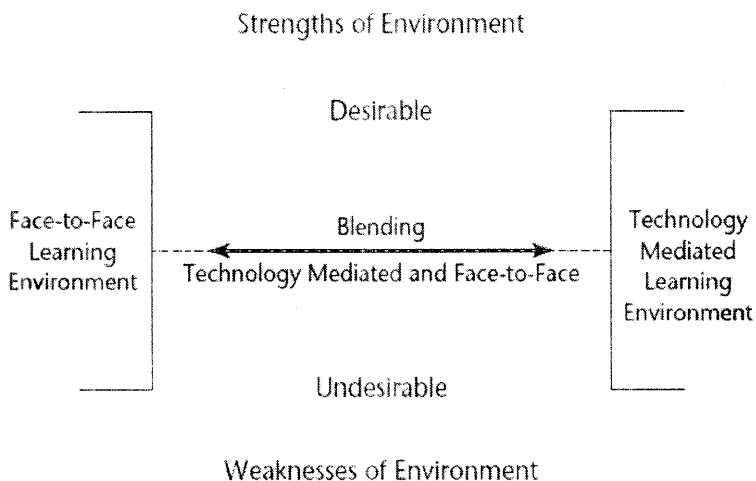
We live in a world in which technological innovation is occurring at breakneck speed and digital technologies are increasingly

becoming an integral part of our lives. Technological innovation is also expanding the range of possible solutions that can be brought to bear on teaching and learning. Whether we are primarily interested in creating more effective learning experiences, increasing access and flexibility, or reducing the cost of learning, it is likely that our learning systems will provide a blend of both face-to-face and CM experiences.

Ross and Gage state that future learning systems will be differentiated not based on whether they blend but rather by how they blend. How to blend face-to-face and CM instruction effectively is one of the most important we can consider. Like any other design problem, this challenge is highly context dependent, with a practically infinite number of possible solutions. So we do not present any one solution as the solution; The wide range of global perspectives and specific local examples available in this book will help readers gain a better understanding of options for meeting instructional design challenges in varied contexts. Our charge is to try and understand the strengths and weaknesses of both face-to-face and CM environments so that when we are faced with trade-offs, we can make appropriate decisions. Given figure is a simplified representation of this complex challenge. From a pedagogical standpoint, the designers of blending learning systems should be seeking best practices for how to combine instructional strategies in face-to-face and CM environments that take advantages of the strengths of each environment and avoid their weaknesses (Osguthorpe & Graham, 2003; Martyn, 2003).

The importance of understanding the strengths and weaknesses afforded by a face-to-face or CM learning environment, consider the following example of an activity-level blend. Class discussions are one of the most common instructional methods used in education. Unlike the lecture, the instructional method of class discussion focuses on learner interaction rather than knowledge transmission. Typically, the goal of class discussion is to have the learners negotiate and co-construct an understanding of the discussion topic. The face-

The Challenge of finding Blends that take Advantage of the Strengths of each Environment and Avoid the Weaknesses



to-face and CM environments have many complementary strengths and weaknesses that impact class discussion. The strengths and weaknesses of conducting discussions in each of these environments.

The strengths and weaknesses of conducting discussions in the face-to-face and CM environments, instructors might use this understanding to make decisions about whether to use one or the other or both learning environments to meet instructional goals. *For example*, by understanding the affordances of face-to-face and CM environments, an instructor of a large-enrollment class might choose to use the CM environment so that everyone in the class can contribute to the discussion. Another instructor concerned about unmotivated students and procrastination might choose to use a face-to-face discussion where social presence and excitement for the topic can be communicated through voice as well as gesture. A third instructor might choose to blend the two learning environments, starting with a brief exploratory.

Strengths and Weaknesses in Face-to-Face and Computer-Mediated Learning Environments

	<i>Computer-Mediated Environment (Asynchronous Text-Based Discussion)</i>	<i>Face-to-Face Environment (In-Class Discussion)</i>
Flexibility	Flexibility: Students can contribute to the discussion at the time and place that is most convenient to them. Participation: All students can participate because time and place constraints are removed. Depth of reflection: Learners have time to more carefully consider and provide evidence for their claims and provide deeper, more thoughtful reflections (Mikulecky, 1998; Benbunan-Fich & Hiltz, 1999).	Human connection: It is easier to bond and develop a social presence in a face-to-face environment. This makes it easier to develop trust. Spontaneity: Allows the generation of rapid chains of associated ideas and serendipitous discoveries (Mikulecky, 1998).
Weaknesses	Spontaneity: Does not encourage the generation of rapid chains of associated ideas and serendipitous discoveries (Mikulecky, 1998). Procrastination: There may be a tendency toward procrastination (Benbunan-Fich & Hiltz, 1999). Human connection: The medium is considered to be impersonal by many (Benbunan-Fich & Hiltz, 1999), which may cause a lower satisfaction level with the process (Haytko, 2001). Participation: Cannot	always have everyone participate, especially if there are dominating personalities. Flexibility: Limited time, which means that you may not be able to reach the discussion depth that you would like.

Advantages of Blended Learning

1. Best personal integration among participants, with the consequent exchange of experiences.
2. Ability to develop collective dynamics.
3. Potential cost savings with the formation of groups, to allow a whole class start and finish the course within the same period.
4. Improved student assessment in live situations, especially when the subject involves the formation of relationship performance and attitude of the student front of the public.
5. Ability to perform field work and visits to places of interest.
6. Humanization of relationship between the institution and students.
7. Improved learning outcomes within specified time, with more diverse media and collaboration among students more intense.

Disadvantages of Blended Learning

Need to organize classes in person, to reduce costs, with specified dates, can limit the access of individual students who wish to study independently and programs with more flexible deadlines, such as e-learning. Limits the access of students wishing to study individual programs independently and with flexible hours.

Devaluation of the online teacher-and high appreciation of Professor presencial Frequentemente distance function is to tutor, or is not the main responsible for the content, but only the relationship with the student's educational system. But Professor Presence has a more significant role, however it is not he who serves the distance learners, students are stranded on both sides: One that dominates the content does not care and who does not care dominates the entire contents.

Problems and Risks of Blended Learning

Need to organize classes in person, to reduce costs, with specified

dates, can limit the access of individual students who wish to study independently and programs with more flexible deadlines, such as e-learning. The course teacher may have a distance (online) and a different teacher in the classroom (in some cases they use multiple classroom teachers according to each topic), which can cause breakdown of the student teacher relationship and create situations failure of communication and evaluation, to weaken the institutional relationship and make leadership indefinitely, with the opposite result of humanization want. Devaluation of the role of the teacher in the distance and excessive appreciation of the classroom teacher. Often the teacher has the distance function of a tutor, or is not the main responsible for the content, but only the relationship with the student's educational system. But Professor Presence has a more significant role, however it is not he who serves the distance learners, students are stranded on both sides: One that dominates the content does not care and who does not care dominates the entire contents.

UNIT-2

Theories of Blended Learning

'Blended Learning' - what is it?

Numerous articles and books deal with the theory of blended learning. The term itself refers to diverse aspects of learning and teaching. When studying the term, it is obvious that there is not only one definition or approach referring to the term. Another feature accompanying the phenomenon is that the term blended learning has no clear translations in other languages. The question could then be if other cases investigating and researching similar questions, not defined as blended learning, still deal with blended learning. It is possible to give a positive answer to this question if the research corresponds to the definitions of what blended learning is. To define research not using the term itself would be a major methodological task and this deliverable will therefore be based only on research where the term blended learning is used.

Gynther (2005) claims that the gap previously existing in traditional- vs. web-based-, distant- or virtual learning is disappearing. In the near future all teaching will be supported by more or less digital or net based flexible solutions in their educational organisation.

A virtual dimension is on its way into all sorts of education, either still experimenting with it or already implementing it. The term blended learning is of American origin. It grasps the blend of traditional teaching and technology based teaching using a wide variety of pedagogical methods and different forms of technology.

Josh Bersin's (2004) book, *The Blended Learning Book: Best Practices, Proven Methodologies and Lessons Learned* gives a

definition of blended learning as the combination of different training “media” (technologies, activities and types of events) to create an optimum training program for a specific audience. Bersin uses the term blended learning as traditional instructor-led training being supplemented with other electronic formats where blended learning programs use many different forms of e-learning, perhaps complemented with instructorled training and other live formats.

Many of the authors using the term blended learning write “how-to-do” books basically for the company-audience. Bersin himself is in this category but also Kaye Thorne (2003) blended learning as the most logical and natural evolution of our learning agenda. He finds blended learning an elegant solution to the challenges of tailoring learning and development to the needs of individuals representing an opportunity to integrate the innovative and technological advances offered by online learning with the interaction and participation offered in the best of traditional learning. It can be supported and enhanced by using the wisdom and one-to-one contact of personal coaches.

In Thorne’s book *Blended Learning: how to integrate online & traditional learning* blended learning is defined as the mix of traditional forms of classroom training and one-to-one coaching with :

- (a) Multimedia technology
- (b) CD ROM video streaming
- (c) Virtual classrooms
- (d) Voicemail, e-mail and conference calls
- (e) Online text animation and video-streaming

In many of the books blended learning have a “how-to-do” approach with (private) companies as their main audience and deal with how the concerned companies can make training more efficient, less cost- and time demanding as their subject-matter. These books address the reader in a very informal, non-academic style with phrases like “How can it help? Is it right for your organisation? How can you implement it?” They

propagate blended learning as the training method for companies suggesting blended learning is hype, is new and solves nearly all training problems.

In addition to the “how-to-do” books, there are of course also several academic articles dealing with the term. Whitelock & Jelfs (2003) opened a journal special issue on blended learning where they introduced three definitions of the term :

1. The integrated combination of traditional learning with web-based online approaches;
2. The combination of media and tools employed in an e-learning environment; and
3. The combination of a number of pedagogical approaches, irrespective of learning technology use.

Singh (2003 in Oliver & Trigwell 2005) as the most common interpretation, also widespread, although sometimes advocated in a more general form as concerning models that combine various delivery modes, rather than privileging e-learning. Oliver & Trigwell find that Singh gives a more substantial description that elaborates on the third possibility, based on what he sees as a much richer set of learning strategies or dimensions that can be blended in ways such as: offline with online; self-paced with live, collaborative; structured with unstructured; custom content with off-the-shelf; and so on.

Kerres & De Witt (2003). They discuss blended learning as a mix of different didactic methods and delivery formats. Their argumentation is based on the assumption that these two are independent of each other.

Oliver and Trigwell mention all of these articles but also refer to Driscoll's summary of her book (2002) in which she identifies four different ‘concepts’ denoted by this term :

4. Combining or mixing web-based technology to accomplish an educational goal;
5. Combining pedagogical approaches (*e.g.*, constructivism, behaviourism, cognitivism) to produce optimal learning

6. Outcome with or without instructional technology;
7. Combining any form of instructional technology with face-to-face instructor-led training; and
8. Combining instructional technology with actual job tasks.

"The above point is that blended learning means different things to different people, which illustrates its widely untapped potential" writes Driscoll (Oliver and Trigwell 2005). Oliver and Trigwell find the explanation offered by Hofmann (2001) more precise.

"The idea behind blended learning is that instructional designers review a learning program, chunk it into modules and determine the best medium to deliver those modules to the learner". Oliver and Trigwell introduce one last perspective provided by Valiathan (2002), describing blends in terms of the focus for learning, or 'intended' learning :

1. skill-driven learning, which combines self-paced learning with instructor or facilitator support to develop specific knowledge and skills;
2. attitude-driven learning, which mixes various events and delivery media to develop specific behaviours; and
3. competency-driven learning, which blends performance support tools with knowledge management resources and mentoring to develop workplace competencies.

Oliver and Trigwell are use of the term blended learning in all contexts because they find that the feature shared by all of these examples and definitions is that they are all described from the perspective of the teacher, the instructor or the course designer.

The main result of this investigation into the use of the term of blended learning based on the articles from Oliver and Trigwell (2005), Whitelock & Jelfs (2003) and several others shows that the concept and understanding of the term blended learning is not a homogeneous field within learning theory.

Learning Theory

Blended learning is its approach to the pedagogical theories. The theory of blended learning does not seem to “belong” to one learning theory but is rather a method used within different pedagogical approaches. In the articles describing blended learning, different pedagogical theories are used (Oliver and Trigwell 2005, Whitelock & Jelfs 2003). Hiltz and Murray (2005) present online learning as the latest in a long list of social technologies that have been introduced to improve distance learning by adding various augmentations, substitutions, or blending of new pedagogical approaches and technologies. The authors find online learning revolutionizing higher education both as a process and as a social institution. They describe online learning as a new social process that is beginning to act as a complete substitute for both distance learning and the traditional face-to-face class. Substituting both because it is a process that will infiltrate the ordinary face-to-face class and because it will radically change the nature of what is thought of as the typical college course.

Roberts (2004) ‘blended learning’ recently has come into fashion as a supplement to existing traditional lectures and tutorials by enabling external students to learn efficiently. He finds the two trends very apparent to all involved in the learning process. *First*, he describes the vast increase in the use of web-based materials to support courses many educators find interaction as the key component of the learning process for many learners. He finds the field of Computer-Supported Collaborative Learning (or CSCL) is the attempt to bridge the gap between interaction and learning and stands as a paradigm of learning that seems likely to become pre-eminent in the twenty-first century.

Thorne (2003) finds blended learning is a way of making learning more individualized referring to Howard Gardner on how people respond positively to different learning stimuli. In this way organizations and schools can give people different ways of working by means of giving them freedom to be themselves. Other pedagogical approaches widely used are the activity theory and the social constructive learning theory (Bjarno 2005).

Taradi *et. al.* (2005) blended learning as one of three educational options in higher education. The three pedagogical principles are WebBased Learning (WBL), Problem Based Learning (PBL), Collaborative learning. Taradi gives a definition of blended learning saying a blended (hybrid) course combines traditional face-to-face and WBL approaches in an educational environment that is non-specific as to time and place.

Alonso *et. al.* (2005) finding solutions to psycho pedagogical problems in new educational category and claim that a psycho pedagogical instructional model based on content structure is the latest in information processing psychology and social constructivism. The authors define a blended approach to the learning process. Technologically speaking, the instructional model is supported by learning objects, a concept inherited from the object-oriented paradigm.

Gynther (2005) points out that the term blended learning puts four different didactical questions in focus :

1. What kind of knowledge should the students get and what kind of pedagogical form will be necessary to organize the teaching from?
2. How do you need to organize the learning room?
3. How do you need to organize the learning milieu?
4. What kind of learning resources can build up under your choices?

The term blended learning is in its most common understanding used as the mix of traditional teaching and the use of net based teaching. Gynther claims that the Americans understanding of the term is very diffuse and argues that it is more fruitful to tie the term to a more concrete didactical method. He also adds that the questions mentioned above are important for the teacher to ask himself when designing a new model of teaching.

Gynther (2005) blended learning does not only regard the blend between technological and traditional classroom teaching but also regards the matter of what to learn and what pedagogical method and what kind of technology that promotes

learning and different forms of knowledge are used in teaching. It is important to find technological solutions that support different didactical choices. Face-to-face communication is, today, just one of several ways to organize teaching and learning. The author describes how the future educational market puts the different educational institutions under new types of pressure due to new types of education, subjects and a new type of students. The new type of students demands a flexible educational design where new user profiles are in focus. This also has consequences for learning design.

The result is that blended learning is not one learning paradigm by itself but rather a delivery mode to be used within other pedagogical models. In this regard it would probably be sounder to introduce blended learning rather as a mode within pedagogy.

Approaches to Blended Learning

Blended learning is mostly understood as a way of blending face-to-face and technology-based teaching and it is further described as one approach to be used within other pedagogical approaches, it would be interesting to look at different kinds of approaches to blend face-to-face and technology-based teaching. Hiltz and Murray (2005) find that face-to-face courses skilfully blended with online learning technologies and methodologies generally are rated by students as significant improvements over traditional face-to-face classes but that the pace of this change depends upon different social factors.

Bersin (2004) offers two concrete approaches and finds that the goal of blended learning is to synthesize face-to-face and technology-based teaching into an integrated mix. In this way teaching can be tailored based on actual needs. *First* of all technology can complement traditional instructor-led programs and secondly it can complement technology-based training where the socialization process is lacking and where the students lack motivation and excitement from the instructor. From this thought Bersin finds two general approaches to blended learning :

1. The “program flow” model : A step-by-step curriculum that integrates several media into a chronological program or syllabus. The Units build upon each other. It ends in an exercise or assessment to measure total learning. This model is comparable to a college or high-school course.
2. The “core-and-spoke” model: One fundamental training approach (onsite classroom training or web-based courseware) with other materials, interactivities, resources and assessments as “supporting materials, optional or mandatory materials that surround and complement the primary approach.

Program flow model—The first approach creates both a deep level of commitment and a high completion rate. Because of this students will feel more engaged and can plan their training over time. Bersin claims that this approach also lets the students find time to fit training into their existing schedules and at the same time it forces them to continue until the conclusion. The approach enables the teachers to track the progress and therefore also find any potential problems. Bersin finds that this approach fits well into classroom teaching. This fits into most instructional design paradigms (learn/try/assess). It serves well for a certification program and it is easy to modify and maintain.

Core and Spoke model—The second approach presented by Bersin is designed with a single course using a single media (electronic or live) employing other media or learning activities as optional or supplementary material. The students decide for themselves which supplementary material to use and they do not need to complete the course at the same time. This approach assumes the students are motivated independent learners. This model speeds up the development process because the training organization can build the surrounding materials over time.

Valiathan (2002) he divides the approach into three: Skill-driven learning, which combines self-paced learning with instructor or facilitator support to develop specific knowledge and skills, attitude-driven learning, which mixes various events and delivery media to develop specific behaviours and

competency-driven learning, which blends performance support tools with knowledge management resources and mentoring to develop workplace competencies. Petra Neumeier (2005) has studied language learning in the course of designing, writing and implementing CALL-supported materials. She finds that course designers need a framework of parameters that help them decide on the individual, context-related implementation of blended learning. In order to achieve a better understanding of the factors that shape the practice and the experience of blended learning she introduces several parameters to form a blended learning environment.

Gynther (2005) increasing demand for better and less expensive education. This has for many been connected with the use of information technology because of the possibility of new and more effective learning outcomes. But the learning outcomes and the possible advantages of the use of technology must be studied in the same broad way as traditional teaching and learning

When starting with blended learning there are some aspects to consider

1. What advantages does face-to-face teaching have?
2. What problems are known due to communication in virtual rooms?
3. What aspects should the teacher prioritize in face-to-face teaching and what can be put to the net based teaching?
4. How to prioritise between different media and forms of media based teaching?

The most important thing is to be aware of the problems and to consider things in advance. Each medium has advantages and disadvantages, in the sense that it can both support and narrow communication for those taking part in the given teaching/learning situation.

When choosing a blended learning approach to be implemented in teaching, the following things should be considered according to Gynther :

1. Do the media give the student a possibility to observe the teacher's communication?
2. Do the media give the teacher a possibility to observe the student's communication?
3. Do the media give the student a possibility to observe the other students' expressed understandings of the study?
4. Do the media give the student a possibility to observe their own expressed understandings of the study?
5. Do the media offer the possibility of differentiating in the choice of information and in choice of ways to communicate?
6. Do the media give the teacher the possibility of organizing the communication between teachers/students? In groups and project work?
7. How does the use of different media and communication form together in the learning milieu?

The blended learning gives teachers different ways of transferring information to the students. In this way the student will develop a greater ability to understand the information and blended learning provides new forms for communication and new didactical possibilities and students with different qualifications can develop a broader ability to learn the information.

There are different approaches of introducing blended learning into teaching. Some of them are outlined in this Unit.. Since blended learning is mostly understood as a way of blending face-to-face and technology-based teaching, the main approach is how to get the two modes into one integrated mix. The structure in the models, the approaches build on the integration of one or several media. It is based on self-paced learning with instructor or facilitator support. It has the choice between chronologically-based or random-based syllabus often ending in an either optional or mandatory assessment to measure total learning. The major aspect when finding the right approach is considering the possibilities, advantages, aspects and the different prioritising in face-to-face teaching vs. technology-based teaching.

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The main result of this investigation into the term of blended learning is based on the articles by Oliver and Trigwell (2005), White lock & Jelfs (2003) and several others shows that the concept and understanding of the term blended learning is not a homogeneous field within learning theory.

The result is that blended learning is not one learning paradigm by itself but rather one mode to be used within other

UNIT-3

Classification of Blended Learning

The growth of online learning in the education sector is occurring both remotely through virtual schools and on campuses through blended learning. In emerging fields, definitions are important because they create a shared language that enables people to talk about the new phenomena. The following blended-learning taxonomy and definitions expand upon and refine our previous work in helping to create a shared language for the blended-learning sector. In blended-learning there are six main emerging in the perspective of the student. This unit introduces a number of changes to that taxonomy based on feedback from the field and the need to update the research to keep pace with new innovations that are occurring in blended learning. Most importantly, the six blended-learning models Face-to- Face Driver and Online Lab because they appear to duplicate other models and makes the categorization scheme too rigid to accommodate the diversity of blended learning models in practice. By moving from six to four overarching models, we have created more breathing room in the definitions. We hope these new models will better describe the majority of programs so that nearly all blended-learning programs will fit comfortably within one of the four.

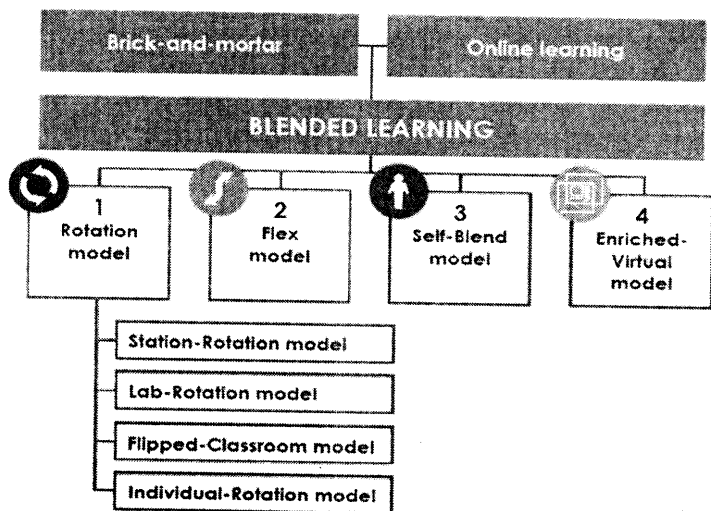
A explains the differences between the new four-model taxonomy and the old six-model taxonomy in greater detail. Two design principles governed the process of updating and expanding upon the blended learning definitions :

1. *Develop flexible definitions so that they can still be useful even as the field continues to innovate.* The definitions are intentionally broad and open, rather than specific. They

- set forth basic patterns that are emerging, but avoid setting tight parameters about how a model “has to be.”
2. *Exclude normative qualifiers.* This principle is a holdover from the last report. Some blended programs are high in quality and some are not. Some use dynamic content, whereas others have more static content. Some are more expensive than the traditional schooling model; others are less costly. The definitions in this taxonomy leave out such appraisals. Just as a hybrid car can be either efficient or a clunker and still be a hybrid car, blended learning can be both good and bad.

The taxonomy in picture depicts a preliminary categorization scheme for the blended learning landscape as it currently exists based upon an analysis of programs that either are preparing to launch or are already in existence. It is important to note that many school operators have implemented more than one blended-learning model for their students. Accordingly, the models represent particular programs within a school, not a typology for whole-school design.

Blended-Learning Taxonomy



Later sections of this paper define each of the elements in above figure and provide examples. As stated in the first report, we continue to believe that these categories will evolve and expand. We invite others to contribute to this research by offering improvements and additions.

Definition of Blended Learning

Online delivery of content and instruction with some element of student control over time, place, path and/or pace—incorporates. They define online learning as education where content and instruction are delivered primarily over the Internet.

The term online learning is used interchangeably with virtual learning, cyber learning and e-learning. We included the phrase “with some element of student control over time, place, path and/or pace” to distinguish blended learning from technology-rich instruction. The second component of the definition specifies that the learning must be “supervised” and take place “away from home.” This is to distinguish it from students learning full-time online at a brick-and-mortar location such as a coffee shop, public library, or home. Someone associated with the brick-and-mortar setting provides the supervision, rather than a parent or other adult who is associated primarily with the student.

Figure 2. Definition of blended learning

Blended learning is...



a formal education program in which a student learns: at least in part through online delivery of content and instruction with some element of student control over time, place, path, and/or pace



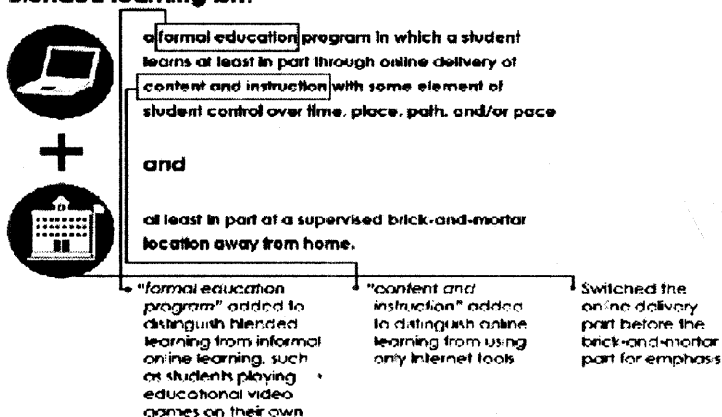
and



at least in part at a supervised brick-and-mortar location away from home.

Figure provides an annotated view of the definition to show the changes from the original definition we proposed in 2011.

Blended learning is...



One common feature of blended learning is that when a course takes place partly online and partly through other modalities, the various modalities are usually connected. In other words, what the students learn online informs what they learn face-to-face and *vice versa*. Furthermore, if students have control over their pace, this control often extends to the entire subject that is blended, not only to the online-learning portion of the coursework. Some researchers believe this connection between modalities within a course or subject is fundamental to blended learning and should be included in the definition itself. We believe that there are strong reasons for its inclusion as well and note it here as an optional addendum.

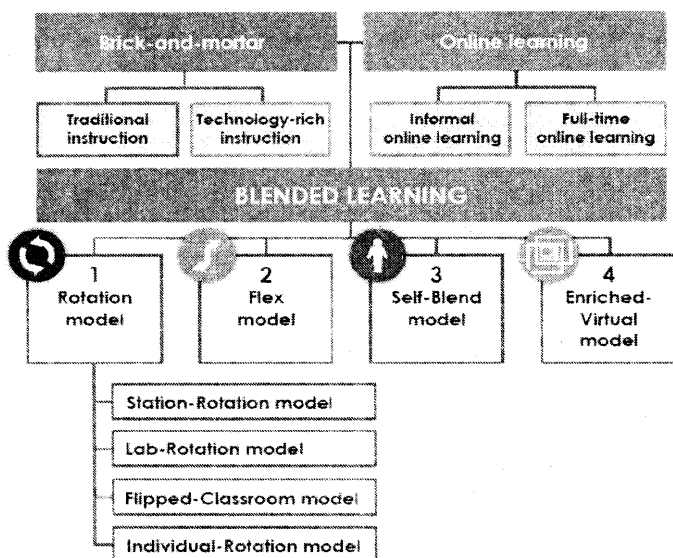
The definition is from a student's perspective. Even if the school itself is not offering online or blended courses, students may still experience blended learning if they are engaged in a formal online learning program on their own while also attending a brick-and-mortar school. They are participating in the combination of both experiences, regardless of whether they initiated the convergence or their school did.

The language in the blended-learning definition is intended to distinguish the definition from other common forms of learning that many confuse with blended learning. The confusion arises because certain education practices—such as

traditional instruction, technology-rich instruction, informal online learning and full-time virtual learning—share some features of blended learning but differ in key ways that exclude them from fitting precisely in the category. *Picture-4* depicts where these practices fit in relation to online and blended learning. The text following this figure provides definitions of each of the highlighted education practices.

Picture- 4.

Blended learning in relation to other education practices



The following are suggested definitions for traditional instruction and technology-rich instruction. These practices are not in and of themselves forms of blended learning, but they can

The education practices highlighted in Figure 4 are neither mutually exclusive nor collectively exhaustive. *For example*, students attending a brick-and-mortar school could be part of a program that has both traditional and technology-rich elements. Furthermore, their program could center on an entirely different education practice, such as project-based learning, which this figure does not include, as project-based

learning could occur in all four of these categories. The intent of Figure 4 is to situate blended learning among a few other education practices for the purpose of differentiation. Combine with online learning to create a blended-learning experience for students. *For example*, students could rotate between online learning and traditional instruction, or they could attend a technology-rich classroom for certain subjects and take online courses for others.

- (a) *Traditional instruction* – A structured education program that focuses on face-to-face teacher-centered instruction, including teacher-led discussion and teacher knowledge imparted to students. Students are matched by age and possibly also ability. Instructional materials are based on textbooks, lectures and individual written assignments. All students in the classroom generally receive a single, unified curriculum. Subjects are often individual and independent instead of integrated and interdisciplinary, particularly in secondary school.
- (b) *Technology-rich instruction* – A structured education program that shares the features of traditional instruction, but also has digital enhancements such as electronic whiteboards, broad access to Internet devices, document cameras, digital textbooks, Internet tools,* and online lesson plans. The Internet, however, does not deliver the content and instruction, or if it does, the student still lacks control of time, place, path and/or pace.
- (c) Internet tools are software applications and programs available on the Internet that provide students with digital functionality but do not deliver online instruction and content. *For example*, a student may use an Internet tool like Google Docs for document creation or Edmodo for social networking. These tools help accomplish a task, but do not provide instruction and content as an online course does.
- (d) The following are suggested definitions for two types of online learning that are distinct from blended learning. Like blended learning, these practices use the Internet to deliver content and instruction and allow students some element of control of time, place, path

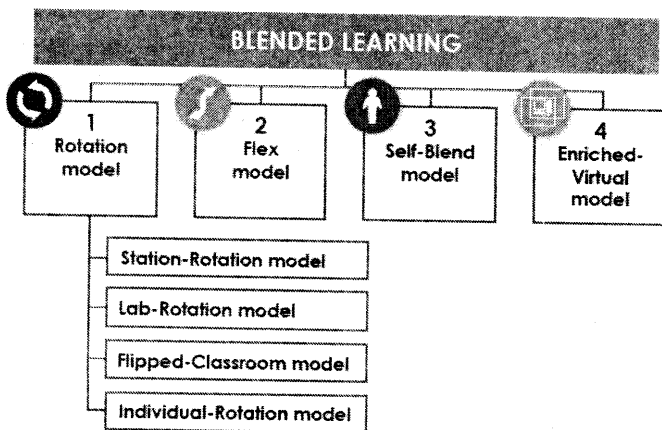
and/or pace. But they fall outside the scope of blended learning in significant ways.

- (e) *Informal online learning* – Any time a student uses technology to learn outside of a structured education program. For example, students could play educational video games or watch online lectures on their own outside of any recognized school program.
- (f) *Full-time online learning* – A structured education program in which content and instruction are delivered over the Internet and the students do not attend a supervised brick-and-mortar location away from home, except on a very limited basis in some cases, such as for proctored exams, wet labs, or social events.

Four Models of Blended Learning

The diagram in *Picture-5* depicts four models of blended learning that categorize the majority of blended-learning programs emerging across the education sector today. The rationale behind eliminating two of the six models from our previous report, titled “The rise of blended learning.”

Picture-5-Blended-Learning Models



The following are definitions of the models and sub-models from above figure, as well as an example of each model.

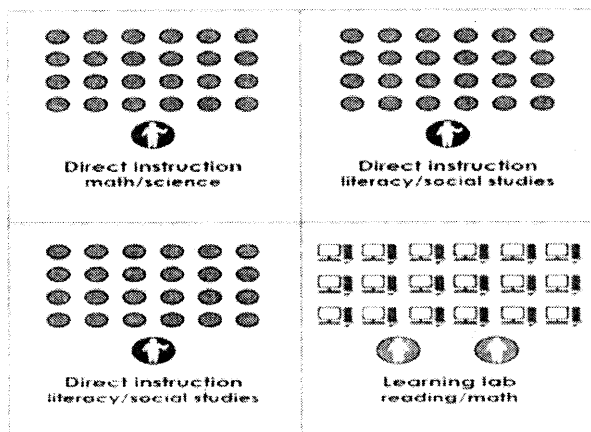
1. *Rotation model* – A program in which within a given course or subject (e.g., math), students rotate on a fixed

schedule or at the teacher's discretion between learning modalities, at least one of which is online learning. Other modalities might include activities such as small-group or full-class instruction, group projects, individual tutoring and pencil-and paper assignments.

- (a) *Station Rotation*—A Rotation-model implementation in which within a given course or subject (e.g., math), students rotate on a fixed schedule or at the teacher's discretion among classroom-based learning modalities. The rotation includes at least one station for online learning. Other stations might include activities such as small-group or full-class instruction, group projects, individual tutoring and pencil-and paper assignments. Some implementations involve the entire class alternating among activities together, whereas others divide the class into small group or one-by-one rotations. The Station-Rotation model differs from the Individual-Rotation model because students rotate through all of the stations, not only those on their custom schedules.

Example: The classroom with 25 computers. Throughout the day the teacher rotates students among online learning, small-group instruction and individual assignments.

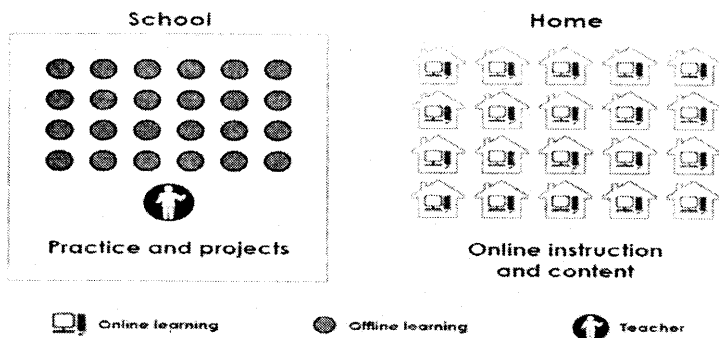
Picture-6



- (b) *Lab Rotation* – A Rotation-model implementation in which within a given course or subject (e.g., math), students rotate on a fixed schedule or at the teacher's discretion among locations on the brick-and-mortar campus. At least one of these spaces is a learning lab for predominantly online learning, while the additional classroom(s) house other learning modalities. The Lab-Rotation model differs from the Station-Rotation model because students rotate among locations on the campus instead of staying in one classroom for the blended course or subject.

Example: At students rotate out of their classrooms to a learning lab for two hours each day to further their instruction in math and reading through online learning Figure illustrates this rotation.

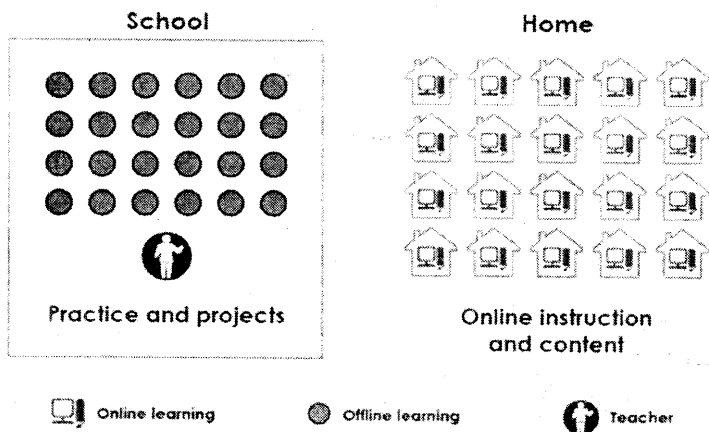
Figure 7 Lab-Rotation model, Rocketship Education



- (c) *Flipped Classroom* – A Rotation-model implementation in which within a given course or subject (e.g., math), students rotate on a fixed schedule between face-to-face teacher-guided practice (or projects) on campus during the standard school day and online delivery of content and instruction of the same subject from a remote location (often home) after school. The primary

delivery of content and instruction is online, which differentiates a Flipped Classroom from students who are merely doing homework practice online at night. The Flipped-Classroom model accords with the idea that blended learning includes some element of student control over time, place, path and/or pace because the model allows students to choose the location where they receive content and instruction online and to control the pace at which they move through the online elements.

Picture -8 : Flipped-Classroom model



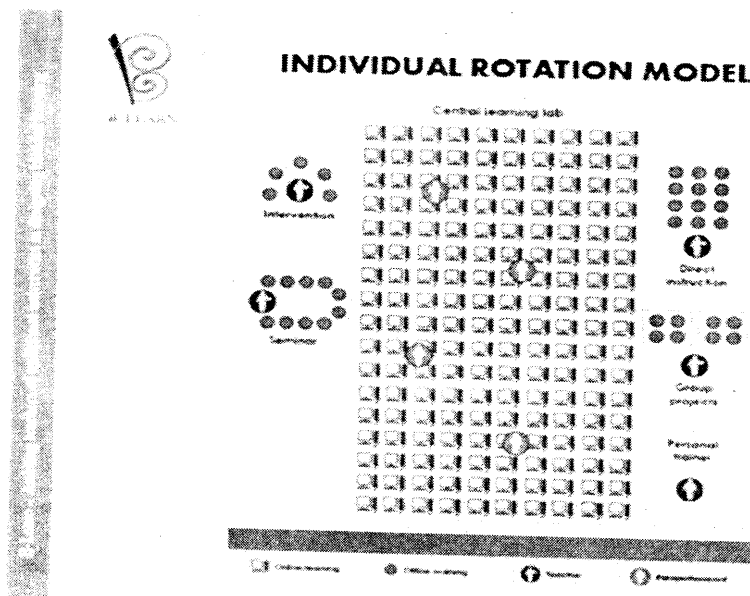
- (d) *Individual Rotation* – A Rotation-model implementation in which within a given course or subject (e.g., math), students rotate on an individually customized, fixed schedule among learning modalities, at least one of which is online learning.

An algorithm or teacher(s) sets individual student schedules. The Individual- Rotation model differs from the other Rotation models because students do not necessarily rotate to each available station or modality.

Example: Carpe Diem Collegiate High School and Middle School assigns each student a specific schedule that rotates them

between online learning in the learning center and offline learning.

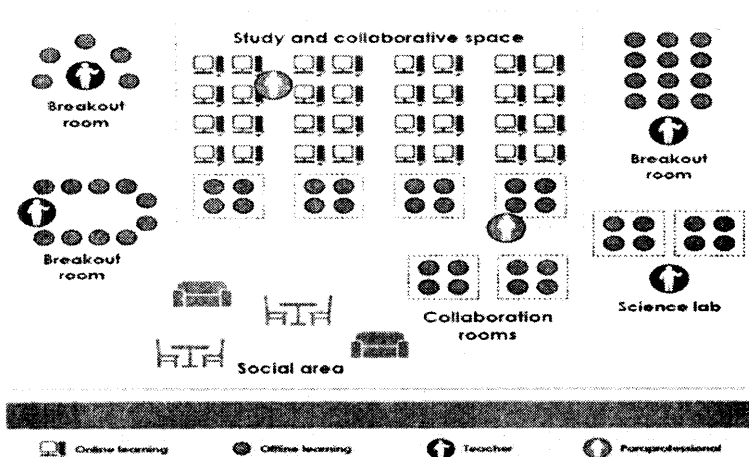
Picture- 9 : Individual-Rotation model



2. *Flex model* – A program in which content and instruction are delivered primarily by the Internet, students move on an individually customized, fluid schedule among learning modalities and the teacher-of-record is on-site. The teacher-of-record or other adults provide face-to-face support on a flexible and adaptive as-needed basis through activities such as small-group instruction, group projects and individual tutoring. Some implementations have substantial face-to-face support, while others have minimal support. *For example*, some flex models may have face-to-face certified teachers who supplement the online learning on a daily basis, whereas others may provide little face-to-face enrichment. Still others may have different staffing combinations. These variations are useful modifiers to describe a particular Flex model.

Example: At San Francisco Flex Academy, the online-

learning provider K-12, Inc. delivers the curriculum and instruction, while face-to-face teachers use a data dashboard to offer targeted interventions and supplementation throughout the day for core courses. The teachers-of-record for the core courses are the face-to-face teachers.

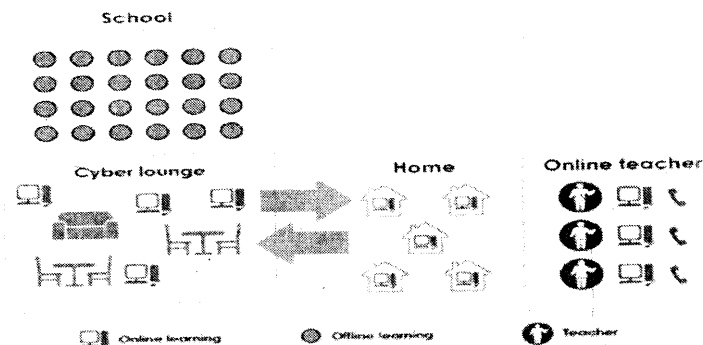


3. *Self-Blend model* – Describes a scenario in which students choose to take one or more courses entirely online to supplement their traditional courses and the teacher-of-record is the online teacher. Students may take the online courses either on the brick-and-mortar campus or off-site. This differs from full-time online learning and the Enriched-Virtual model (see the next definition) because it is not a whole-school experience. Students self-blend some individual online courses and take other courses at a brick-and-mortar campus with face-to-face teachers.

Example: Quakertown Community School District (QCSD) in Pennsylvania offers students in grades 6–12 the option of taking one or more online courses. All students complete a cyber orientation course prior to enrollment. Courses are asynchronous and students can work on them any time during the day. QCSD has

created “cyber lounges” where students can work on their online courses at school, but they are also free to complete the courses remotely if they prefer. The teachers-of-record for the courses are the online teachers, most of whom also teach face-to-face courses for QCSD.

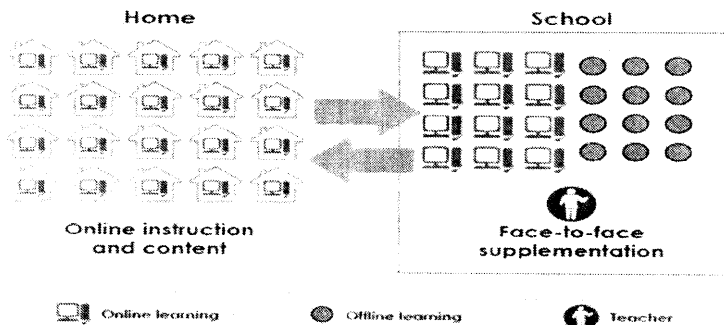
Self-Blend model



4. *Enriched-Virtual model* – A whole-school experience in which within each course (e.g., math), students divide their time between attending a brick-and-mortar campus and learning remotely using online delivery of content and instruction. Many Enriched-Virtual programs began as full-time online schools and then developed blended programs to provide students with brick-and-mortar school experiences. The Enriched-Virtual model differs from the Flipped Classroom because in Enriched-Virtual programs, students seldom attend the brick-and-mortar campus every weekday. It differs from the Self-Blend model because it is a whole-school experience, not a course-by-course model.

Blended-learning taxonomy that we introduced in “The rise of K–12 blended learning,” published in January 2011 and its follow-on report, “The rise of K–12 blended learning: Profiles of emerging models,” published in May 2011. Its most notable change is the condensing of the six blended-learning models to four. Numerous education experts provided feedback to help

Enriched-Virtual model



us arrive at the four models. The following is a discussion of some of the rationale behind the changes.

First, we eliminated the Face-to-Face Driver model because it was not substantively different from the Flex and Rotation models, except that the students in Face-to-Face-Driver programs often engaged with online content for shorter bursts of time. We also eliminated the Online-Lab model. It was the same as the Self-Blend model, except that it described students who took courses on campus, whereas the Self-Blend described students who took courses off campus. This distinction did not work because too often students did a little of both. We combined the two in Self-Blend to encompass any time students take an online course—either on-site or off-site—to supplement their face-to-face courses.

Second, changed the definition of the Flex model to allow it to encompass some elements of the excised Online-Lab model. The old definitions of Flex and Online Lab tried to distinguish the two by specifying that Online-Lab implementations involved less face-to-face support for students. That distinction was problematic because the dividing line between the two was hard to pinpoint. The new Flex definition is broader and allows for both types of staffing models.

Some implementations have substantial face-to-face support and others have significantly less. The broader Flex definition makes clear, however, that in all Flex programs the

teacher-of-record is on-site, even if that teacher provides little face-to-face enrichment of the online coursework.

Third, we sub-divided the Rotation model into four common implementations. The other models will likely develop sub-categories also as they mature and researchers deepen their understanding of the phenomena. Fourth, we changed the name of the Online-Driver model because it was easily confused with aspects of the other models or with full-time virtual learning. Instead, we suggested the newly named "Enriched-Virtual" model, which we think has a more precise and specific definition than did the Online-Driver model.

UNIT-4

Blended Learning and Selecting the best Instructional Method

Blended learning has become today as a method for delivering training to large, diverse employee populations. This trend is driven in large part by the need to deliver more kinds of training to more employees in more places—within existing training budgets. The definition of blended learning has also changed, from a simple blend of classroom training and e-learning courses to more complex programs that incorporate an array of synchronous and asynchronous learning modalities. Whatever the mix, the goal is to empower the individual to achieve understanding of a given topic, become self-sufficient, improve his or her job performance and ultimately drive results that support business objectives.

Blended learning can support a variety of informal learning processes. This “performance support” function is an increasingly important part of the job for many corporate training departments. Blended learning expands the traditional role of training beyond the its usual scope of formal training by providing a robust set of tools that allow employees to obtain the information and instruction they independently and uniquely need, all within the daily flow of work. A just-in-time approach to learning brings with it new challenges and new opportunities. Training professionals need to have a strong understanding of the suitability of various tools to achieving learning objectives.

Ultimately, good blending is about establishing a balance between the instructional advantages for the learner and the learning objective. Blended learning captures the best of both worlds by allowing learners to pick and choose how they want

to learn and affords them greater flexibility and convenience about when they want to learn. It can be as simple as combining two different learning methods (reading a book before going to a classroom) or as complex as obtaining a degree via a longer-term distance education program.

Defining Blended Learning

The term blended learning has become ambiguous. According to Dr. Margaret Discroll, blended learning is defined as a combination or mixing of at least four different methodologies, including :

1. Mixing of technology-based learning (e-learning, collaboration, virtual classroom, etc.)
2. Combination of pedagogical approaches (behaviorism, cognitivism and constructivism)
3. Mixing of forms of instructional technology (face-to-face, Internet, CD-ROM, etc.)
4. Integrating instructional technology with actual job activities

According to the U.S. Department of Labor, 70% of workplace learning occurs informally through books and articles, fellow employees, water cooler discussions and even trial and error. Only 30% of employee learning takes place through formal activities such as leader-led classes, seminars or structured courses. However, most corporate training initiatives focus their efforts and their budgets, on formal training.

Since most of learning occurs in informal settings, perhaps the greatest single potential gain for blended learning is in this area. Currently, many companies are successfully integrating classroom training with e-learning, mentoring support, simulations, online reference material and virtual tools in order to support informal, on-the-job training.

Today's learning are on the formal side of the time to performance continuum. The net result is that we spend the most money on the smallest part of the learning equation.

Blended learning goes beyond good and basic training to a

more systematic education that promotes ongoing learning. By developing learning strategies that incorporate a wide variety of learning activities—classroom instruction, virtual meetings, online books, mentoring, self-paced study, simulations and assessments—companies can more efficiently utilize learning resources while offering employees more learning flexibility and improved performance support. Employees can choose the type of learning that best suits their particular learning style, the amount of time available and the kind of information needed.

Too often blended learning is viewed as some kind of hastily mixed “learning stew,” a potluck combination of instructor-led classes, self-study courses, corporate library resources and various seminars and conferences.

The having the greatest success with blended learning take a more methodical approach. For instance, IBM’s Basic Blue blended learning model structures curricula so that learners spend approximately 80% of their time obtaining information through a variety of self-study materials ranging from white papers, student guides and PowerPoint presentations, as well as role-plays, simulations and assessments. The remaining 20% is reserved for leader-led classroom study. This approach allows the company to condense actual class time, since much of the material is covered in other information sources. Additionally, learners attending the classes are better prepared by going through the prerequisite materials.

Unisys University currently has more than 200 active blended learning curricula paths encompassing technical and business skills development. More than 7,000 employees worldwide are currently enrolled in Unisys University and more than 3,500 have completed one or more blended curricula paths. The blended learning curriculum has proven to be so popular (satisfaction rates range from 85 to 95%) that the company is evaluating the development of an additional 50 blended curricula paths.

Two Key Learning Experiences

The fast-paced growth of e-learning has brought about a new context for learning within corporate and academic organizations. The exciting and developing universe of learner-centric methods balances the traditional classroom approach and the constantly

evolving technology-based learning. This balance has tremendous potential for building increased performance within all organizations.

By mixing traditional methods with new ones, we now have synchronous and asynchronous tools that provide modern training and learning programs with two very powerful methods.

The synchronous (real time) domain is the more traditional instructional approach to online training and has the instructor (or mentor) and learner available at the same time. Usually they are in the same place where all participants share the learning experience and may interact with each other. It is also possible for learners to be in different places at the same time. Synchronous training via the Internet is very helpful to learners that are willing to adjust their learning style away from the traditional classroom or lab.

Asynchronous (different time) means that the instructor (or in most cases, computer-based courseware) and the learner are available at different times, a benefit for self-directed learners that like to learn at their own pace and own time. A blended learning solution should place appropriate emphasis on both important learning domains.

Synchronous Instructional Methods

Methods in this domain consist of traditional classrooms, virtual classrooms, live product practice (labs), interactive chats and mentoring (coaching).

Live Classroom (Traditional)

Traditional classrooms allow instructors and learners to be face-to-face in the same place. The subjects usually consist of topics (complex, broad, programmatic or new content) that require face-to-face interactions, expert observation, culture building, team building, networking, business problem solving or materials to be presented by an instructor or facilitator. The term Instructor-Led Training (ILT) is used synonymously with on-site training and classroom training (c-learning).

Advantages: Allows the dissemination of unpublished material and learners to have access to peers and experts. Group discussion and practice can be engaging and add additional interest in a topic. Traditional classroom learning complements learners with certain learning preferences (those who depend upon highly teacher-centered methods) and is a good method for “people” people. It also provides gradual development of complex or difficult concepts and theories.

Disadvantages: Classroom training can be expensive if learners must travel to the classroom location. Also, learners are required to attend sessions at a set time and classrooms usually require large blocks of time from the learner. If the session is lecture based, discussion and interaction are reduced. Classrooms can place the learner in a passive role and their attention may be lost.

Live Classroom Method

<i>Using This Method</i>	<i>Using Another Method</i>
Teams of people will be using the information and skills to work together to achieve business goals	Business goals are not affected by whether people learn in the same place.
Learners have job roles that permit extended absences from daily activities.	Learning can be delivered in small chunks, integrated into the regular activities of the target-learning group.
Skills involve extensive practice in face-to-face interaction with others or practice with complex physical skills	Business objectives make it difficult for learners to take extended absence from daily activities
Comprehension requires group interaction around subjective topics	Mastering subject-matter is not affected by physical proximity

Virtual Classroom

A virtual classroom allows instructors and learners to be different places at the same time and allows the instructor to archive the event for later viewing. These events are usually conducted via virtual meeting tools. The topics covered can be similar to those in a live classroom unless it is too complex or contentious.

Advantages: You don't have to be at the classroom location to benefit from the instruction. You can raise your hand by clicking a button. A list of other students in the class is viewable

and you can hear an instructor speak. Additionally, the instructor can pass a virtual microphone to you so that you can be heard by the entire group. Information can be presented and desktops and computer applications can be shared across the Internet.

Disadvantages: Everyone must be online at the same time. In most cases, the participants need advanced workstations and a high-speed connection. The instructor must have technical skills, adequate resources and is personally dedicated to making the event interactive. Just like live classrooms, informational sessions can place the learner in a passive role and learner attention may be lost.

Virtual Classroom Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Business will benefit from rapid distribution of information or skills to widely dispersed groups.	Content is highly contentious or complex
Content can be effectively delivered in Less than one to two hours.	Retention requires extensive practice.
Business will benefit from ability to capture learner and presenter interactions and content for reference and replay.	Business will benefit from professional quality broadcast recording

Live Demo or Practice (labs) Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Business needs are not met by investing in detailed simulation of complex hardware or software.	It could destroy working products.
Team-based practice is critical to understanding of complex hardware.	Business goals can be met easily and cost-effectively via simulation.
Excess capacity of live product and instructors for in person training.	Limited live product and experienced instructional staff available.

Broadcast (TV or Streaming Video) Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Business will benefit from professional quality broadcast recording. Content needs to be created quickly, but will not be updated frequently.	No business significance to broadcast quality production values. No business value to providing video to supplement content message. Frequent content upgrades required

Interactive Chat Session Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Learners have divergent needs that cannot be met by one-size-fits-all instruction. Expert resources are available for one-to-one information sharing and support.	Content is highly subjective or potentially divisive. Experts cannot maintain regular schedules. Technology limits access.

Online Information via Web site Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Basic concepts, policies, procedures, corporate information needs to be available to widely dispersed audience over an extended period.	Content must be updated frequently. Insufficient resources to maintain Web sites. Practice is key to mastering content.

Online Instructional Materials Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Practice is key to mastering content. Learners are geographically dispersed. Learner job roles demand rapid acquisition of new skills.	Content changes infrequently – once learners have mastered it, little need to refresh or update skills. Small learner population, geographically centralized, with limited turnover. Learner technology makes it difficult to access online content reliably.

Learner job roles require maximum learning schedule flexibility.	Insufficient resources to maintain Web sites.
Learners have the right technology to access content and practice at own pace.	Limited or nonexistent performance and learning management systems.

Resources exist to maintain and update content.
Content can be linked to other learning resources.

Online Reference Materials Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Learners need to access content during flow of work.	Content changes infrequently – once learners have mastered it, little need to refresh or update skills.
Learners are geographically dispersed.	Small learner population, geographically centralized, with limited turnover.
Learner job roles demand rapid acquisition of new skills.	Learner technology makes it difficult to access online content reliably.
Learner job roles require maximum learning schedule flexibility.	Insufficient resources to maintain Web sites.
Learners have the right technology to access content and practice at own pace.	Limited or nonexistent performance and learning management systems.

Resources exist to maintain and update content.
Content can be linked to other learning resources.

Offline Instructional Materials Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Small number of learners makes distributing content easy.	Rapidly changing content.
Relatively long shelf life for content.	Large, changing user base.
Basic concepts, policies, procedures, corporate information never changes and does not need to be communicated widely.	High need for portability. Need to distribute content widely and update frequently.

Threaded Discussion Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Learners have divergent needs from the content that cannot be met by one-size-fits-all instruction. Expert resources are available for group information sharing and support. Learners need to enter discussion at different times and be able to catch up on conversations that have occurred.	Content is highly subjective or potentially divisive. Experts cannot maintain regular schedules. Technology limits access.

Electronic Performance Support System (EPSS) Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Content supports users developing software application skills. Learner benefits from on the job access to context-sensitive support.	Learning content is not software. Limited need to refer back to content information once mastery achieved.
Learner requires ongoing reference to context-sensitive support.	

Job Aids Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Content key points can be condensed into brief "how to" aids. Job process changes are frequent, but small and easy to understand. Learners have already mastered the basics of the job role processes covered by the content.	Content is highly detailed or complex. Requires extensive interaction. Learners have limited need for reference materials after initial training.
Regulations require checklists or procedures to be completed exactly in sequence and according to a specific process without shortcuts or errors.	

Product Simulation Practice (Virtual lab) Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Safe environment required: live practice could destroy live systems.	More cost effective to work directly on live system. Possible to work on live system remotely.
Learners can't easily access live systems.	Mastering complex skills requires team-based activities on working system.
Need for trained users are greater than systems available for training.	Regulations require certified hands-on practice with live systems.

Live Practice Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
In-person teamwork central to using new skills to support business results.	Individual practice effective and learner population is dispersed.
Small, geographically centralized learner population.	Practice most effective if performed in small units spread out over several days or weeks.
Limited consequences of failure.	Practice most effective if reinforced by application on the job immediately.
Access to repeated practice critical.	Significant danger if practice on live system fails.
Certification requirements mandate live practice.	

Simulation-Based Practice Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Business critical concepts.	Simple concepts – can be mastered with information sharing or informally by most workers.
Legal implications of misapplication.	Small business impacts.
Complete comprehension is critical before live application.	Stable concepts.
Certification requirements.	

Written Tests Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Goal is to test knowledge and information recall.	The required outcome of the training is behavior.
Case study analyses are good indicators of job performance.	There is no right answer. There is no need to remember; a job aid or example can be used.

Performance Tests Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Physical performance of a skill or behavior is the required outcome of the training.	Raters are allowed too much freedom in judging acceptable performance. There are insufficient rater resources and no means of videotaping performance for later study.
Observers (raters) can be trained and deployed to observe performance or analyze work products.	Awareness or knowledge about a skill is sufficient.

Self-Assessments Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Elective learning – no job role implications.	Tie performance to job advancement.
Within learning overall – use in concert with more formal measures.	Develop objective measures of individual and group performance.
Communicate results except to individual	

Formal Certification Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Regular certification requirements for job roles.	There is no agreement on what constitutes "certifiable" performance.
Regulatory requirements.	

Books Method

<i>Consider Using This Method When</i>	<i>Consider Using Another Method When</i>
Inexpensive, consistent and pleasantly tangible.	Non-interactive.
Portable and easy to transport.	Limited sensory involvement.
High comfort level since everyone knows how to navigate.	Completing a book is a commitment, only about half are completed.
Readily available.	Difficult to distribute to a large group of people.

UNIT-5

Strategies on how 'Blended Learning' can be Integrated within Traditional Education

This chapter discusses about strategies on how blended learning can be integrated within traditional Learning Universities. The deliverable will outline examples from other projects that have integrated blended learning within traditional universities. First there is an introduction to the use of the term of blended learning before giving examples on strategies in teacher training, language education, strategies in health education, in social sciences and humanities and finally examples on strategies in engineering and natural science education.

The term blended learning is in its most common understanding used as a mix of traditional teaching and the use of net based teaching. Whitelock & Jelfs (2003) opened a journal special issue on blended learning where they introduced three definitions of the term :

1. the integrated combination of traditional learning with web-based online approaches
2. the combination of media and tools employed in an e-learning environment; and
3. the combination of a number of pedagogical approaches, irrespective of learning technology use.

Of these, the first is the most common interpretation according to Singh (2003 in Oliver & Trigwell 2005).

If blended learning is going to be a used method in an educational institution, the Danish theorist Gynther (2005) points the fact that the term blended learning should put four different didactical questions in focus :

1. What kind of knowledge should the students get and what kind of pedagogical form will be necessary to organize the teaching from?
2. How do you need to organize the learning room?
3. How do you need to organize the learning milieu?
4. What kind of learning resources can build up under your choices?

Above questions essential for the teacher to consider while designing a new mode of teaching.

Bersin, (2004) finds the biggest problem with instructor-led training and to teach thousands of students to providing one-to-one teaching and hands-on experience is nearly impossible. Another problem is the timescale. The way, these problems are often solved in institutions, is to introduce technology into instruction. Bersin believes that blended learning in this sense can extend the instructor model in space and time. In this way blended learning could be provide education to a larger number of students. Blended learning is not only a method of reducing faculty time or re-focusing student time but also a way to admit more students to an academic program (Cottrell and Robison 2003).

Aspden and Helm (2004) also mention, the presence of a Virtual Learning Environment (VLE) in an on—campus setting can alter the dimensions of existing learning and teaching relationships. More students will then not necessarily be the same as there is less contact with teachers and the staff. Research literature indicates that increased engagement with educational technology can have the effect of drawing staff and students closer together (both physically and virtually) rather than encouraging campus-based institutions. On-campus students can benefit from appropriate use of technology in ways that

make them feel increasingly connected with their institution and their peers. Technology can help to bridge the physical gap between the students, their institution and their peers – even where the actual interactions between students take place offline – and the combination of physical and virtual learning environments can be used to create an effective learning and teaching experience.

Many educators claim that blended learning is not a new phenomenon. What is new is the sheer range of possible components in a blend. The basic factor within blended learning is to decide through selected criteria how these components should be blended. This is the only way to produce fruitful blends. The focus must always be the learning outcome together with learners, learning culture, learning resources, electronic infrastructure, scalability and maintainability in designing, developing and delivering different types of blends. Increasing choice is not an end in itself (Clark 2005).

Many of the books available on blended learning have a “how-to-do” approach. Most of these books are written for Industrial trainers within companies (Bersin 2004, Thorne 2003 and McGinnis 2005). The main focus is on how companies can make training more efficient, less cost and time demanding. Blended learning is portrayed as a new phenomenon that solves nearly all training problems. These books address the reader in a very informal non-academic style with phrases like ‘How can it help?’ ‘Is it right for your organisation?’ ‘How can you implement it?’ And they propagate blended learning as a training method to be used in organisations.

It is difficult to find this kind of “how-to-do” solutions in more traditional academic literature. The academic literature is based on projects where blended learning has been put under investigation. The main goal for these projects is to find out whether the introduction of blended media has an impact on the learning outcomes (Taradi *et. al.* 2005, Bjarno 2005, Neumeier *et. al.* 2005, Voogt *et. al.* 2004 and Concannon *et. al.* 2005, Burgon and Williams 2003, Motteram 2006). In the following part, there will be an introduction to some of these academic research projects given.

Examples on Strategies in Teacher Education

Bjarno (2005) describes how national research shows that teacher training students do not know how to integrate ICT as a constructive tool into the disciplines. Not ICT skills are needed, but, first of all, some good examples of how to use ICT as an integrated part of different disciplines. When The Ministry of Education and Science in Norway developed a new National Curriculum for Degree Program in Teacher Education in 2003 the Department of IT at Oslo University College regarded this as an opportunity of reorganizing ICT teaching and supervision in teacher education. The entire faculty supported the initiative and started to plan a project aimed at developing multi-disciplinary didactics with ICT to reduce the gap between the lack of practice in teacher education and the needs in primary and secondary schools. In order to realize this the IT department used the concept of blended learning to arrange for the adaptation of learning.

Bjarn (*ibid*) examined the combination of using blended learning for students preparing to integrate ICT as a tool for supporting learning processes when being a teacher to close the gap between the teachers' ICT knowledge and their ability to use it for enhancing the learning process. Could ICT as a part of the lectures in the other disciplines be a way to prepare students for their work as teachers? Integrating ICT in all disciplines seemed to be a good solution to achieve the goal. The students had ICT skills but needed examples on how to integrate it in their teaching. In order to realize this goal, the ICT Department started to help lecturers at the college to integrate ICT in their different disciplines instead of focusing on separate ICT courses. By incorporating the didactical use of ICT in the learning process, teacher training students were given a useful tool for further learning. The students used the teaching material in several ways, but mainly :

1. As a web-based teaching material – online
2. Get physical lectures (up to 350 students)
3. Get supervision connected to assignments in computer suites (up to 30 students)

Lectures were given on selected themes and consisted of a web-based teaching material with assignments. It also involved links to different media such as video-explanations, animations, pictures and soundtracks, connected to supervision in computer suites. The method required a computer suite equipped with a video-projector and one computer per student.

The results showed that there was a continuous need for a didactical dialogue between the Department of IT and the other lecturers in order to achieve successful ICT integration. Integration of ICT into all the disciplines showed that the focus was moving away from scheduled lectures towards new educational forms based on supervision, which allowed teachers to spend more quality time with each student.

One of the basic challenges for the implementation of the project at the University was the infrastructure. All the lectures had to get new computers installed with the same software as the students and the number of computers and video-projectors in the classrooms had to be increased. The findings of the project showed that there was an increase of 21% of students answering that ICT lessons and supervision were useful for the learning process compared to the year before the integration of ICT. Bjarno finds that the challenge is to move from delivering separate ICT courses to developing multi-disciplinary teaching material with ICT.

Not only teacher training students need to learn how to use technology in their teaching. Voogt *et. al.* (2004) also report on how teachers lack skills of integrating technology into their instructional processes. The potential of technology in the classroom is hardly realized and the teachers' learning of classroom use of technology is considered important. Voogt *et. al.* (*ibid*) look at "blended" in-service arrangement to support secondary school teachers in the integration of technology into their classrooms. The arrangement consisted of workshops, exemplary curriculum materials and computer mediated communication. This blended approach to teacher professional development showed that it seemed to be a promising arrangement for supporting the integration of technology into education.

For teacher training students practice may be one of the

most important parts of their education. In another example Motteram (2006) looks at the role of blended learning in teacher education at a Master's program at Manchester University. The findings from this project also show how important the blended nature is for the students to get a balanced program that upgrade skills and knowledge and also enable them to reflect on past and future practice.

In another university teacher training course for prospective teachers of English the students had mini-practice, which implemented micro teaching in a classroom setting, as a part of the blended learning method. The learning concept was based on theories of situated learning in multimedia-enhanced learning environments where the activities included classroom recordings and multimedia-based case stories and electronic interview with an expert who was an experienced grammar school teacher. The practice offered guided insights into analyzing teaching materials, hands-on experience with lesson planning and the experience of acting as a teacher in an authentic teaching context.

Case studies used as a didactic tool in teacher education were supposed to contribute to a closer and more reflective relationship between theory-driven and practice-oriented aspects of teacher education. The multimedia-based case studies were hypertexts designed as essential components of computer-based learning modules that supported various ways and styles of learning. Students worked with the case study material either in guided or in self-regulated scenarios several times during the course. It has been found that there are three types of learners: Students who mainly create and apply experiences, students who mainly study theoretical resources and students who create experience by focusing on a selection of resources (Kupetz and Ziegenmeyer 2005).

Examples on Strategies in Language Education

Language learning should not only activate the teacher but also the students in a way that makes them learn. It is not only important for the language teacher to learn to use technology in their teaching but may also be fruitful for students taking part in a

language course. In this perspective, both teachers and students need systems designed in such ways that will enhance learning. Petra Neumeier (2005) looks at language learning in the course of designing, writing and implementing CALL-supported materials. She finds that course designers need a framework of parameters that help them decide on the individual, context-related implementation of blended learning. In order to achieve a better understanding of the factors that shape the practice and the experience of blended learning she has found several parameters to form a blended learning environment. The main parameters have been derived from and influenced by the research and development project JoblineLMU at Munich University:

Parameter individual description

1. Mode –focus on mode	Distribution mode choice of modes
2. Model of integration-sequencing individual modes	Level of integration
3. Distrution of learning content and objectives and setting aims	Use of teaching methods employed
4. Language Teaching Methods models employed	Use of teaching methods in each of the
5. Invlvement of learning subjects	Interactional patterns: individual vs.(student, tutors and teachers) collaborative language learning ctivityVerify of teacher and learner roles Level of autonomy
Location	Classroom, home, outdoor, computer room, intuitional settings

The parameters describe and conceptualize a blended learning environment for language learning and teaching purposes (Neumeier 2005:167). The author finds that if the parameters are applied successfully, the idea of blended learning could serve as a bridge between the broader community of language teachers, learners, CALL experts and practitioners.

Language learning was the introduction of a web-based learning program of English for Academic Purposes (EAP) for British students from ethnic minority backgrounds described

by Harker and Koutsantoni (2005). The students participated in two different modes of learning during the 9-weeks long program - blended learning and distance learning. The authors find that the blended learning mode is much more effective in student retention, whilst student achievement levels are similar in both groups. In addition, formative and summative feedbacks from the students suggest that most students in both groups are satisfied with this web-based EAP program.

Examples of Strategies in Health Education

Ellis *et. al.* (2006) report a phenomenographic investigation into students' experiences of learning through discussion both online and face-to-face. The study context was a second-year undergraduate course in psychology for social work in which the teacher designed discussion tasks to begin in face-to-face mode and to continue online. A combination of open-ended questionnaires and semi-structured interviews was used to investigate students' conceptions of what they were learning, what their intentions and their approaches were to learning through discussion.

The analysis of the interviews and open-ended questionnaire data has identified a number of qualitatively different conceptions, intentions and approaches to learning through discussion. Associations have been found between what students thought they were learning through discussions their approaches to learning through discussion and their course grade. The authors have found that students with a cohesive conception and students adopting a deep approach got better course grades. Furthermore, the findings show that there is no significant difference between deep and surface approaches to face-to-face discussion and course grades.

Davies *et. al.* (2005) examined B.Sc Physiotherapy students' experience of developing their neurological observational and analytical skills using a blend of traditional classroom activities and computer-based materials at the University of Birmingham. New teaching and learning resources were developed and supported in the School of Health Sciences using Web Course Tools combined with a wide range of video clips of patients

with neurological disorders on CD-ROM. These resources provided students with the opportunity to observe “real patients” prior to clinical placements, thus, bridging the gap between their theoretical understanding of these disorders and their practical experience of evaluating abnormal movement in the clinical setting.

Another example for the health sector is given by Guldberg and Pilkington (2006). They analysed a sample of online discussions to evaluate the development of adult learners as reflective practitioners within a networked learning community. Their analysis demonstrate that students belong to an overarching community of practice with different subsets, like these students being parents and carers of people with Autistic Spectrum Disorder (ASD), worked together at sharing and co-constructing common understandings. The shared discourse and common notions of what constituted good practice helped to create a safe interaction space for the students. Once group identity was consolidated, more challenging questions emerged and the group was able to define further common values, understandings and goals through processes of resolution.

Examples of Strategies in Social Sciences and Humanities Education

Both in the social sciences and the humanities producing texts is a major part of education. Learning by producing text has been done by the use of technology like computers for a long time. Several text shaping programs have been introduced over the last few years. Cox *et. al.* (2004) evaluated the educational effectiveness of online chats at a Humanities post-graduate course and in the final year of a Commerce course. The authors have found that the roles of blended course design, group dynamics and facilitation style in the use of online collaboration within face-to-face courses facilitate more inclusive learning conversations than what is possible with exclusively face-to-face interaction.

Webb *et. al.* (2005) suggest that it is the model of learning and its fit with supporting technologies, rather than the presence of technology *per se*, which enhances learning outcomes. The authors looked at four distinct semester-long treatments, which

varied the mixes of classroom and online discussion. This was used to teach a graduate Management Information Systems (MIS) survey course. Their findings suggest that by using Web technology, college instructors may offer students the option of participating in high-quality courses using the case method pedagogy in an online environment. Furthermore, the findings show that the students not only appear to do as well as in the traditional classroom, but that students in the online environment may perform better at multiple levels of learning outcomes, especially when using a blend of classroom and online technologies. Furthermore, the precepts of the case method pedagogy may be enhanced by the use of online discussions. The authors suggest that instructors employing the technique may find their own importance devalued, while the time demands of the approach can be much greater than for traditional classes.

Examples of Strategies in Engineering and Natural Science Education

In engineering and natural sciences education the use of technology may be much more common than in many other disciplines. Still Derntl and Motschnig-Pitrik (2005) find that there has been little attention in research paid to integrating technology to improve the learning process in terms of depth and scope. The experiences and evaluations of one major academic course on Web Engineering indicates that blended learning adds value only when facilitated by educators with high interpersonal skills and accompanied by reliable and easy-to-use technology.

In 2002, the teaching of radiological anatomy to first-year medical students was changed from group learning (20-30 students with a preceptor and films at a view box) to a blended learning model that included a brief didactic introduction followed by small group (7-8 students) web-based structured learning modules with rotating lab instructors. In 2003, the modules were changed to include self-study cases prior to the lab, follow-up cases and twice-weekly optional review sessions. The findings show that integration of computers as didactic instruction with small and large student groups is well-accepted

by students and make the students conform to accept theories (Shaffer and Small 2004).

Academic research and projects related to organizational aspects in learning

The blended aspect will also have an organisational effect as well as a didactical. As long as learning is a part of an institution, the methods used for teaching will also have an organisational effect. Boeker and Klar (2006) have found that didactical and organizational aspects determine the success e-learning offers as well as influence the general development of e-learning more than technical features do. They explain how e-learning has been established in education and training of physicians in various types : Linear, sequential and hyper-textual forms of multimedia presentations and texts, tutorial systems and simulations. Case-based e-learning systems are of special importance in medicine because they allow for mediation of process and practical knowledge by presentation of authentic medical cases in a simulated environment. The integration into medical education and advanced professional training is crucial for the long-term success of e-learning. In case-based systems this can be accomplished by blended learning approaches which combine elements of traditional teaching with e-learning. Learning Management Systems (LMS) support integration of traditional teaching and e-learning by serving as an organizational platform for the content of teaching. Furthermore, they provide means of communication for trainers and trainees, authoring tools, interactive components, course management and a role-based sharing concept. The authors have found that the dissemination of e-learning can be fostered by paying attention to requirements and user analysis, early adoption to organizational structures, curricular integration and continuous cooperation with students. Another organisational effect and maybe a major treat for organisations to implement technology within the institution may be the possibility to get more students enrolled and concurrently reduce time spent by the personnel of the organisation. Cottrell and Robison (2003) describe a large enrolment accounting course at Brigham Young University (Utah). The case study focuses on

the possibility of using blended approaches to reduce faculty time, re-focus student time and raise the possibility of using blended learning as a way to admit more students to an academic program.

As mentioned above, Welker and Berardino (2005) studied the outcome of blended learning at the State University of New York Institute of Technology. Responses from faculty revealed enrolment as a major factor in the increased use of this course design; quality of assignments and course grades that are as good or better; and courses that produce improved writing and discussions. Course management technology and course design recommendations were provided for faculty consideration. The findings show that while the design was easy to use, the faculty reported more work on their part and some loss of traditional classroom dynamics.

Blended solutions may also have an organizational effect on students' location and may also solve the time/space dimension. The emergence of cross-cultural classrooms has been steadily increasing in Australian tertiary institutions, due to the growing population of international students enrolling to complete their degrees. Research has suggested that students from different cultures have varying compatibility with different learning environments. Lanham and Zhou (2003) explain how the increase in numbers of international students has signified a change in the student demographics and the recognition of the differences in students' learning styles. Because of this a more flexible approach for learner content delivery is needed. The authors suggest that in order to ensure that all students are able to participate in this domain; preparations are needed to accommodate all cultural types.

Summary

The current report shows that there are several ways to integrate blended learning within traditional universities. Blended learning is not a new approach within university teaching and learning. What is new is the sheer range of possible components in a blend. The institutions must decide, through selected criteria, how these components should be blended to produce fruitful blends. A blended course must constantly determine the balance between face-to-face and technological components in using blended

learning as a didactical method. This calls for educational designers to be sensitive.

The field of blended learning is diverse in its nature and it investigates several different aspects of the learning process and the learning environments. This deliverable has reviewed blended learning from four different angles: first, projects in which the integration of technology into teaching has been one of the main goals, secondly, projects in which the experience of learning has been the main focus, thirdly, didactical consequences and finally, in which organisational changes as a result of blended learning has been the main issue. Different findings are reported based on which of the four above mentioned aspects is emphasised.

Blended learning is not only to blend different media. In designing, developing and delivering different types of blends - component, integrated, collaborative or expansive - the learning outcome must be in focus. This cannot be investigated without a look at the learners, the learning culture, the learning resources, the electronic infrastructure, the scalability and the maintainability of the proposed solution.

UNIT-6

Blended Learning in Commercial Practice

The most common understanding of blended learning is the integrated combination of traditional learning with web-based online approaches. Also the understanding of blended learning as the combination of media and tools employed in an e-learning environment is often in use while other authors interpret it as the combination of a number of pedagogical approaches, irrespective of learning technology in use (Whitelock & Jelfs 2003). This deliverable will introduce blended learning models from a few authors interested in the commercial practice of blended learning. *Secondly*, it will give some examples of the introduction of blended learning into industry.

Models in Commercial Practice

The blended learning as a tool to investigate the use within learning and interested in the actual use of blended learning within industry and commercial practice. Blended learning as the integrated combination of traditional learning with web-based online delivery modes. Thorne (2003) as mentioned in deliverable 2.1 and 2.2 write books based on an audience interested in implementing blended learning as a training method within the company and industry sector. Thorne sees blended learning as a way of making learning more individualised and refers to the theorist, Howard Gardner, on how people respond positively to different learning stimuli. In this way, organizations and schools can give people different ways of working, based on multiple intelligences.

As Thorne (*ibid*) sees it, one of the real advantages of blended learning is the opportunity to be more focused and specific about the learning need. Blended learning provides the opportunity of tailoring learning to the individual rather than applying a one size fits all approach. From this, he puts up a list of seven points to help identify the basic needs :

1. Establishing the level of demand/timescale. The very nature of the blend builds in flexibility.
2. Recognizing different learning styles. Asking the question of how students do things differently takes into consideration different learning style preferred.
3. Looking creatively at the potential of using different forms of learning, *i.e.*, matching the learning need to different delivery methods and identifying the best fit. The integration of blended learning represents an opportunity to take what exists and evolve it into a different dimension using new technologies - by presenting the learner with a wide range of options.
4. Working with the current providers, internal and external, to identify the learning objectives and to ensure that the provision meets the current need. (For a university this should already have been done. For a new subject this should be done).
5. Undertaking an educational process and developing a user-friendly demonstration to illustrate the potential of blended learning.
6. Being prepared to offer follow-up coaching support and
7. Setting-up a monitoring process to evaluate the effectiveness of the delivery (Thorne 2003: 36ff).

Furthermore, Thorne sees several benefits based on what type of medium the content is available in :

1. The class is not kept waiting while the trainers help a few delegates to catch up on basic knowledge
2. Delegates have the chance to cover the basic material at their own pace.

3. Reference to the intranet / internet several times for extra support
4. Dissemination to a wider audience
5. A larger body of training materials can be made available to users
6. If people miss a day, they can catch up using multimedia packages
7. Saving time and travel costs
8. The ability to make geographically dispersed virtual teams
9. The lessons and the activities can be studied prior the one-to-one sessions or the classroom activities freeing time for more practical activities in the classroom.
10. Creating individual courses supplementing classroom tuition and examinations
11. Cost-cutting because of saved time in tutoring
12. Learning can be more targeted, focused, just-in-time to the learner
13. Learners can interact with tutors, fellow students. (Thorne 2003).
14. Another writer within this tradition is Bersin (2004).

Since the advent of computers in the 1960s' organizations have been trying to apply technology in the learning and training process. First technology-based training approach came with mainframe and mini-computers in the 60s and 70s and mentions a pioneering system of such named Plato, a system developed in 1963 by Control Data at the University of Illinois. Plato pioneered the use of computers in traditional educational settings and still exists today. Bersin puts up two general approaches to blended learning :

1. *The "program flow" model* : A step-by-step curriculum that integrates several media into a chronological program or syllabus. Like taking a college or high-school course. The Units are building on each other. It ends in an exercise or assessment to measure total learning.
The "program flow" model creates a deep level of

commitment and a high completion rate. Learners feel engaged and can plan their training over time. It gives learners the time to fit training into their existing schedules but forces them to continue until the conclusion. It enables the teachers to track the progress and if people drop out or miss steps, it will be possible to know precisely where they have a problem. It fits into the normal flow classroom training that most people expect. Many learners are used to learning in this way through their academic careers over semesters and years. This is also the model most existing contents use and it fits into most instructional design paradigms (learn/try/assess). It serves well for a certification program and it is easy to modify and maintain.

2. *The "core-and-spoke" model:* One fundamental training approach (onsite classroom training or web-based courseware) with other materials, interactivities, resources and assessments as "supporting materials, optional or mandatory materials that surround and complement the primary approach.

In the "core-and-spoke" model approach, the program is designed with a single course using a single media (electronic or live) and uses other media or learning activities as optional or supplementary materials. The main difference between the core-and-spoke approach and the program flow model is that the supplementary materials are optional and not explicitly scheduled. The students decide which supplementary material to use and the students do not necessarily complete the course at the same time. Using reference material is an easy way to build a core-and-spoke model. In general, is it easier to build in stages in this approach? If you build the core curricula, you can launch it immediately and add the supplementary materials over time. But this approach assumes you have a motivated independent learner. The core-and-spoke model speeds the development process because the training organization can design the surrounding materials over time. The spoke material can be made more important with

exercises and events and be specialized for special needs. The core-and-spoke model is effective when learners are motivated, experienced and already experts. It gives them the choice of media and resources to succeed.

Bersin—Blended Learning Model

1. *Program type*: Driven by business needs like costs. If the problem is a training issue and not a management issue and has an impact on the management.
2. *Cultural goals*: Create relationships, linkage and shared values.
3. *Audience*: Size, education level technology competence access, motivation to learn, personal motivation, time.
4. *Budget*: development.
5. *Resources*: Time, money and persons. Time to launch and complete the program and the content.
6. *Learning content*: Complexity and interactivity.
7. *Technology*: Standards, plug-ins, bandwidth, display, security.
8. *What effects program cost*: Total audience size.

Furthermore, the following model in blending different teaching media is suggested:

The model may work for blending traditional teaching and technology in both traditional universities and in workplaces. He also lists four examples of types of corporate training:

Type 1: Information Broadcast

Typical e-Learning or training Interactivities: Read, listen, watch

Typical Blended Media: Conference call, webinar, e-mail or newsletter

Type 2: Critical skills Transfer

Typical e-Learning or training Interactivities: Read, listen, watch and ask and answer questions

<i>Model</i>	<i>Defining Feature</i>
e-learning self-study with other blended model or event	A self study course as the central program. The learner accesses multiple media elements surrounding an online core and speak course.
Instructor led program blended with self study e-learning	E-learning used as prerequisites, activities during the class and between classes.
Live –e-learning centered with other media added	Webners e-learning events ,self study
On the job training	On the job training with a instructor
Simulated and lab-centered	It and application training where an entire environment can be simulated.

Typical Blended Media: PowerPoint-based courseware, live e-learning webinar, track completion but not scores

Type 3: Skills and Competencies

Typical e-Learning or training Interactivities: Read, listen, interact, practice, ask questions, interact with others, take an examination get feedback

Typical Blended Media: Web-based courseware, instructorled class, conference call, onsite labs, simulations

Type 4: Certification (as represented or meeting a standard)

Typical e-Learning or training Interactivities: Read, listen, interact, practice, answer questions, take an examination, get feedback, pass or fail

Typical Blended Media: Web-based courseware, instructorled class, conference call, onsite labs, simulations, external or internal testing, tracking by LMS for completion and expiration date.

Blended learning in a program is how much tracking and reporting is necessary. The business requirements determine which level of tracking and reporting is needed in the company.

Practise has shown that people will not complete more than one or two hours of self-study per week unless this is explicitly allocated in their work schedule. Bersin's suggestions are that when you know the business problem - have an idea of the program strategy and an appropriate budget - you should design and develop the program. You have to find the right media for your problem, audience and budget (Bersin 2004).

Blended learning models for companies are Semler (2001) and Troha (2002). Suggests some relatively simple techniques to help you convert courses into blended delivery. There are three overall objectives to this activity: (1) increase learning impact, (2) increase learner satisfaction and ease of use and (3) reduce the total cost of training. Learners are also allowed to explore and work with the content wherever it makes sense for them. By offering portions of a course as online self-study, the length of face to face training sessions and the associated delivery and travel costs can be reduced. Troha (*ibid*) provides a model intended to guide you and your team through the process of blended learning design. By virtue of its checks and balances, a successful outcome is virtually assured. Accompanying the model there is a list of sections for an instructional design document, which, as it is developed and fine-tuned, provides a vital discussion document and focal point for all parties involved in the project. The list contains the following items: Course Title, Purpose Statement, Audience Description, Duration, Prerequisites, Learning Objectives, Constraints, Content / Learning Activities Outline, Transfer of Learning Strategy and Evaluation Strategy Content Sourcing.

Some of these books give examples on how blended learning is incorporated in different companies. In the following there will be an introduction of some of these examples.

Examples from Industry Training

Blended learning is a popular model in the US commercial setting, but is less exemplified in the European area. Research confirms that technology has low use today in most organisations' leadership-development programs. Evidence points to growing use, but the researchers do not expect quick and dramatic change,

because rapidly changing technology does not necessarily imply accelerating adoption unless the culture is conducive to technology use. But a number of driving forces are likely to boost the adoption of technology in leadership-development programs such as :

1. Leadership portals
2. Simulations for interactive, experiential learning - often in blended formats and
3. Rich media content.

The technology becomes more user-friendly and easier to use, technology will find new applications in leadership development (Trondsen 2006).

Brennan (2004) online delivery of training (*i.e.*, e-learning) has surpassed the early-adopter stage and companies find that the longer they use it, the more they use it. A cost-cutting slant has been effective in fostering its growth as a tool at the disposal of training professionals. However, training and development professionals should recognize that cost savings will not perpetuate themselves and should focus their energies on increasing the value of their services to the corporate mission by efficiently and effectively delivering content that supports both organizational and individual goals.

There has been a rapid growth in trade union involvement with ICT to support both vocational learning/workforce development and trade union education. Most European confederations and many individual unions now have some level of involvement with technology and learning and we can start to learn from each others' approaches and experiences.

Six case studies were conducted between June and October 2004 along with an online survey. There were five national case studies from Italy (Confederazione Italiana Sindacati Lavoratori), Germany (Deutscher Gewerkschaftsbund (DGB) Bildungswerk), the Netherlands (Federatie Nederlandse Vakbewegingen), Sweden (Landsorganisationen Sverige) and the British (Trades Union Congress) and one transnational case study from the European Trade Union College (ETUCO). These cases illustrate some of the diverse ways in which trade unions

are approaching the use of ICT to support formal and informal learning, vocational and trade union training, blended learning, organisational and self-paced learning; and national and transnational learning. The case studies reveal a range of approaches towards the use of ICT in trade union learning which reflects a variety of organisational priorities and responses in particular national contexts. Differing industrial relations environments, Union Cultures, National Government policies and initial experiences with ICT in learning are among the factors contributing to this diversity (Creanor and Walker 2005).

General Motors company relies heavily on video-based instruction to train dealers. The aviation Industry CBT Committee developed the most useful and widely implemented approach to enrolment, tracking, reporting and book-marking electronic content. AICC standards were built into almost every course and every LMS available in the marketplace today. Today SCORM (Sharable content object reference model) a superset of AICC, is slowly becoming the new standard for content packaging and interoperability. SCORM builds on AICC and adds concepts such as reusability, sequencing and searchable metadata.

A European alternative to the SCORM model is the IMS-LD model (Learning Design) researched and developed by the Dutch Valkenburg group. The model introduces standardised ways to describe learning activities both within the man-computer context and also in the face-to-face one, which has been one of the tools and techniques to lay out blended learning activities such as instructor based learning, e-learning and collaborative approaches online and in face-to-face meetings is the strength of the IMS-LD model. This makes the IMS-LD approach viable for blending learning technologies and methods (Koper and Tattersall 2005).

Global oil company decided to redesign their entry-level engineering training on petroleum practices, they realized that socialization was critical to the success of the program. Their blended program, which was months in duration, used online and face-to-face activities in a structured mix. The program included self-study, web-based modules, classroom instruction,

synchronous online chat and online assessments. They were located all over the world but met each other in a training facility near the end of the program where they could face-to-face reinforce the cultural community they had created online. When incorporating blended learning for a study program, it was necessary to ask how important it was to develop a sense of culture and social experience in the program.

(Bersin—2004:44f) Telephone distribution for industry products wanted to find a new way to get busy telephone sales representatives to take online courses on a new version of a SAP system. Last online course turned out to be disaster since people was too busy to take the training. This was a problem since the company wanted people to be completely proficient before the new system went live. Not only were people too busy to take the training but there was no time during the software rollout to let people practice. The company decided to focus on cultural factors and created a blended program. They started with a series of conference calls and local meetings held by regional coordinators. The coordinator brought people together and created a local “social context” for the training. By adding socialization and local presence the learning results turned out to be three to four times higher than those of the previous e-learning program.

As described below Bersin introduces the “program flow” model and the “core-and-spoke” model. In this section Bersin shows examples on where the different models are in use :

The “program flow” model :

Ex.1 : Roche Pharmaceuticals desive a program for learning their SAP order processing system. One of the lessons learned from these programs is that process training is just as important as application training. The company had to go back and develop a face-to-face module, which included whiteboard pictures and diagrams, to explain the business process from a functional perspective. It was after this took place that the blended learning model started to work.

Ex. 2 : BT had a new product to launch and wanted to start a training course but found that their employees

would use too much time to cover all the topics. They therefore decided to start a blended learning project starting with a hosted conference call before they had a two-hour e-learning program, an instructor-led check-in conference call to answer questions, a second one-two-hour e-learning program and finally an instructor-led one-day event with real world practice. In his way they managed to shorten down the time previously allocated.

- Ex.3 :** A major U.S. bank had each year 2,400 new employees to train on blended learning program was introduced, the company used the course that took six weeks to be completed. The goal of the new program was to shorten it down to four weeks. The team in charge of the blended learning program developed a series of web-based training courses with different scenarios, simulations, role plays, group discussions and briefing sessions with the manager. The program took nearly twelve months to develop but had excellent results and facilitators reported that learners reported being on the same level of mastering as reported after five weeks in the prior instructor-led program.
- Ex.4 :** In 2001, CAN Insurance needed to roll out an entirely new performance planning process to more than 2,000 managers before the end of the year. E-learning efforts in the past were disappointing due to low enrolment and lack of interest. The new approach was blended learning implemented an innovative web-based platform that enabled learners to enter the blended environment online. On this environment each student were members of a cadre, which is a team of fifteen to thirty people who work through the program in the same schedule, score each other's exercise and interact throughout the program. In addition they had an online coach that served as a tutor, advisor and teaching assistant. Through the platform a high-impact blended learning was made and the learner satisfaction and business impact went up dramatically (Bersin 2004: 36ff).

The “core-and-spoke” model :

- Ex.1:** In a semiconductor manufacturing engineer training program, the blended learning program combines online component with hands-on lab sessions. By doing this, nine in-class days was reduced to two ten-hour self-paced online courses followed by two eight-hour lab sessions and a short instructor-led event to reinforce information, practice and answer question they had.
- Ex.2 :** A large retailer with 650 stores around the US found that online learning was not enough to learn modules concerning topics like “ how to sell HDTV”, “understanding stereo components”, etc. The result was a core-and-spoke program where they introduced a checklist where the learners had to walk through the store, identify items and perform tasks. By this simple approach the company improved their e-learning investment.
- Ex.3 :** Rolls-Royce PLC Since 2000, Rolls-Royce plc has been faced with training requirements to support a large Enterprise Resource Planning implementation, involving major changes to company processes and the introduction of SAP as the IT system to support the processes. Based on best experience they changed the model for training from computer-based training as a prerequisite to instructor –led training to online learning where the instructor led training reinforced the online lessons and used the face-to-face element as a vehicle for communication in change and introduced the online learning lessons so delegates are prepared for online learning – post-workshop.

Summary

The blended learning models from a few commercial practice of blended learning. Models on how to blend materials and instructional methods are described and also criteria for selecting between them. Examples from the industry sector are provided

and two of the main models for sequencing content are described: the “program-flow” and “Core and spoke”. Further, examples are given of successful implementations of both models, also explaining the reasoning behind the decision of which model to use.

UNIT-7

The Benefits of a Blended Learning Approach

The research projects and supported projects have shown that blended learning approaches enhance learning outcomes through :

- (a) inclusion of more differentiated /personalised instruction
- (b) increased access to resources, experts and learning opportunities
- (c) more authentic and student driven tasks being incorporated into the curriculum
- (d) higher student engagement
- (e) greater opportunities for collaboration (especially beyond the classroom and involving the wider school community)
- (f) exposure to a wide range of Web 2.0 technologies and acquisition of contemporary literacy skills
- (g) better access to infrastructure and, anytime, anywhere learning.

Learning Outcomes

The series of research on schools from 2006-2011 have demonstrated improvements in student learning, attitudes and engagement as a result of integrating blended approaches into teaching and learning.

The blended learning trials offered greater options for

personalisation of students in control of their own learning. Students were able to vary their pace of learning, drawing on as few or as many resources as necessary, choosing tasks/resources that best suited their learning styles and level of prior knowledge. Students could use teacher created vodcasts to review class work, practise their knowledge of a text by playing their aligned online games and demonstrate knowledge of principles by recounting their own understanding of the topics through claymation storytelling. Blended learning approaches allowed students to shine in competencies other than the traditional literacies, as leaders, ICT technical experts, cultural experts, resource managers and negotiators. They also acquired new literacies of online protocols (cybersafety), intercultural understanding through exposure to global connections and constructing/synthesising knowledge from non-linear content. As a result, students became more informed, more resourceful and constructed their own learning paths, ultimately producing better work outputs.

Increased system knowledge of how to use and integrate ICTs into better teaching and learning practices raised expectations and outcomes for students.

Access to infrastructure assisted both teachers and students to achieve better outcomes through flexible access to content instruction and experts.

The students enabled their work to expand beyond the classroom boundaries and provided students with the means to document and reflect on their learning and share and validate their learnings through their personal networks. By using such tools as digital portfolios, films and games they were able to create evidence that demonstrated deeper conceptual understanding, enquiry and knowledge.

Connected Learning

The Victorian blended approaches facilitated connected learning. Students became better connected to their learning environments both in-school and beyond the school. This included teachers, coaches, peers and community experts, locally and globally.

The portability of ICT devices and the ease of sharing the

learning outputs via a range of online options extended learning opportunities well beyond the classroom walls through online conferencing, blogging, forums and discussion boards. Students tended to produce more considered projects when their work was likely to be shared or viewed by parents, experts and their peers.

Changes in Student Practices, Behaviours and Attitudes

For the student engagement and motivation for completing tasks were observed. This has been attributed to familiarity with technologies already used by students outside the classroom and the novelty of some of the ICTs used in blended learning and collaborative tools (virtual conferencing), social networking and gaming were especially popular.

The learning tasks that ICTs can accommodate also contributed to higher levels of student engagement. In one example, students could test their knowledge through quizzes, acquire new knowledge through games and reflect on their learning by producing their own podcasts all on the one device, the iPod. Students began to control the construction of knowledge as there was less dependence on traditional instruction and more self-driven tasks were allocated.

Students changed their behaviours to become more reflective, collegial and collaborative (engaging in peer coaching and team activities) and far more accepting of peer review and external feedback. Engaging in more reflective and self-monitoring tasks also enhanced their understanding.

Changes to the teacher-student relationship were also noticed when students were empowered to act as leaders, coaches, mentors and technical experts. Teachers were freed from having to understand the technologies, so spent less time on technical instruction and more time supporting learning.

A teacher participating in the *Ping* (2009) project noted that the students coped well with the new learning environment and as the project progressed felt more comfortable with it: "The kids just seem to do it naturally!" (Teacher)

One teacher from the *Chinese Language Learning with Web 2.0* (2009) project observed that motivating students in language

learning was often a challenge but that the use of blended approaches made the task so much easier.

A teacher from the *Sharing Our Environment* (2010) students who were reluctant to communicate openly with others, were able to speak freely and contribute to class conversations after Skyping neighboring rural schools. In the same project, students enjoyed seeing the different work produced by other students and often included some of the ideas in their own work.

A similar outcome was also observed in the *Stories from Around a Campfire* (2010) project, where teachers noted that providing opportunities for the students to view their own performance and that of their peers in other schools heightened their awareness of the need to arrange their thoughts, use a clear voice and use appropriate eye contact.

Teacher Factors

Improved Pedagogy, Teacher Skills and Confidence

Research outcomes from Victorian blended learning reinforce current thinking that the positive impact of ICT on student learning outcomes is strongly linked to improved pedagogy and course design, especially the development of more authentic, student-centered learning tasks.

When ICTs were fully integrated into classroom practices, (embedding them as opposed to just adding technologies), it was noticed that teachers took a more deliberate approach to lesson planning.

They focused more intently on developing tasks relevant to a student-centred approach to learning activity design; designing tasks to accommodate different learning styles and purposes; making use of more diverse teaching resources; and improving their understanding of the technologies and subject content.

The research revealed that teacher confidence and knowledge of teaching with ICTs contributed to a more engaging and considered curriculum and subsequently, better student outcomes.

Relationships with Students

Because students were allowed to assume the roles of leaders, mentors and co-creators, a new trust developed between teachers and students.

Teacher Development

The *Ping* (2009) demonstrated the potential to build teacher capacity by engaging classroom teachers with Web 2.0 pedagogies in their classroom practices.

Rural Kids Connected (2010) teachers used Microsoft Communicator, Microsoft Live Meeting, Elluminate, Google Docs, blogs and e-mail for the majority of the collaborative planning. This enabled regular planning and professional development sessions to be carried out in a virtual environment, increasing participation and reducing travel. Teachers were also exposed to a variety of content creation tools, like go Animate and Voicethread. Google Docs was particularly useful in co-developing curriculum and assessment.

Community Intercultural and Cultural Opportunities

Teachers involvement in the blended learning trials that they didn't have to be experts on everything and that the students didn't expect them to be the founts of all knowledge. *Ping* (2009) and the *Chinese Language Learning With Web 2.0* (2009) enabled the students to interact with community leaders and other subject experts in areas where this wasn't possible in a face-to-face setting on a regular basis.

Students participating in the *Using Web 2.0 for Indonesian in the Campaspe Network* (2010) project hosted three Indonesian exchange teachers and used a range of Web 2.0 technologies (e.g., voice threads, Screencaster, Glogster and Wikispace) to enhance their language skills.

In the *NGV Floating Worlds Project* (2009) students engaged with curators of the National Gallery whilst in the *Creating Links with The Bayside Community Project* (2010) students drew on expertise of local historians and local residents.

Addressing Disadvantage

Rurality – Connecting Small Rural Schools

Rural Kids Connected (2010) blended learning as a way of connecting small schools in a cluster, allowing students to communicate regularly with other students from similar rural communities.

The technology not only allowed the students to further develop their ICT skills, the more exciting methods of communicating also helped enhance their communication skills. Students who were previously reluctant to engage in conversation began talking more freely when speaking with other students from different schools.

Students used a variety of technology such as easy speak microphones, flip cameras and digital still cameras to create videos and slideshows to share with the students at the other schools. Prep and Year One students used Skype on a touch screen computer to present their project work and writing to students from the other schools. They also communicated through written letters and emails.

The success of the *Rural Kids Connected* (2010) project encouraged one community to comment that they were keen to continue the collaborative learning approach and hoped to use the Ultraset as the collaborative learning platform.

These rural projects also assisted with isolation and transition to secondary school by making connections with students in their primary years.

The *Ping* (2009) project demonstrated that a blended learning model for music education has potential to address and alleviate access to high quality musical resources for rural schools in South-West Victoria.

The use of a blended learning model and the provision of digital resources provided for schools with limited music instruction to incorporate high quality music education into their curriculum offerings. The project was able to excite and engage the students sense of musicality.

Similar observations were made in other VELs domains, especially in English and mathematics, where games, online quizzes and learners creating their own podcasts and

animations kept students more engaged and even seeking their own learning opportunities.

Special Needs

The blended learning approach to the students with special needs and preference for particular learning styles. Students who struggled with writing skills were able to express their understanding of concepts and reflections through student produced vodcasts. Students with Asbergers developed confidence with socialisation and oral competency by making films using green screen technologies.

Students with disabilities used the electronic whiteboard and web cameras to view their own actions and achievements.

The Advantages of Blended Learning

From a pedagogical perspective, blended learning aims to incorporate the best aspects of face-to-face classroom learning experiences with the best of mobile and online learning experiences. This allows:

- (a) An increase in learning outcome measures and lowering of attrition rates compared to fully online courses (Dziuban, Hartman & Moskal, 2004).
- (b) An opportunity for students to practise technology skills in navigating online course materials and creating their own digital content for assessment.
- (c) An increase in student-teacher and student-student interaction through the use of communication tools like discussion forums, blogs and shared web content on the electronic whiteboard.
- (d) The ability to reserve face-to-face time for interactive activities, such as higher-level discussions, small group work, debates, demonstrations, or lab activities.

For students, the appeal of blended learning includes :

- (e) Flexibility and the freedom to learn anytime, anywhere

- (f) Some level of control over the pacing of their learning. Difficult concepts can be reviewed as often as necessary
- (g) More engaging content that they can create and use their own initiative and networks to shape.
- (h) The opportunity to engage and draw on expertise that would otherwise not be available to them without costly travel, such as virtual conferencing with zoo/museum/gallery staff or virtual excursions to overseas historical or culturally significant landmarks.

Challenges in Implementing Blended Learning Strategies

The Research has identified a number of challenges for teachers and students to implementing blended learning strategies :

1. developing blended pedagogy
2. teacher support and professional development
3. technological challenges
4. student preparation/support and transition
5. assessment considerations
6. culture and innovation.

Developing Blended Learning Pedagogy

Teachers using a blended approach can be challenging for some as it may require the acquisition of different teaching skills, re-designing the curriculum and the inclusion of new teaching and learning opportunities, managing the learning content both online, in-class and beyond the classroom walls and preparing students to work in blended modes.

Most negative feelings towards blended of learning tend to be generated by poorly designed approaches. It takes a great deal of thought and careful planning to deliver a quality learning experience regardless of the mode of delivery (Idaho Digital Learning Professional Development, 2009).

Adopting a blended learning approach must start with a re-examination of the intended learning outcomes. The teacher

needs to design learning activities that support these intended learning outcomes, personalise or differentiate learning and then integrate these activities effectively with the required assessment tools.

Teachers should prepare their students for the blended learning style and discuss the new roles and responsibilities. Some students won't be used to working independently or may be unfamiliar with some of the technologies, so support mechanisms will need to be put in place for these students 6.2 Teacher Support and Professional Development . Feedback from the trials indicated the capacity for teachers to incorporate new technologies into teaching and learning programs may be limited without an expanded time commitment and better support from IT staff and additional professional development.

Professional development options to be considered include adding new competencies to the curricula, assessment schemes more suited to blended delivery and graduate training to encourage blended teaching and learning approaches across all curriculum areas.

Other options might include motivating and/or rewarding teachers for the innovative use of blended learning approaches to improve student outcomes plus support from peers and technical experts.

Teacher training needs to include and refine competencies of teachers in taking on a more facilitative role: Skills such as questioning, creativity, observation, differentiation/scaffolding and facilitating collaboration and networking opportunities and especially in understanding of and imparting of knowledge of online protocols (such as cyber ethics and intellectual property).

Support for teachers can often come from peers. The *Overcoming ICT Barrier In The Seven Hills Cluster (2010)* allowed the teachers from each school to communicate more effectively and to plan curriculum tasks together, where previously they would only meet on cluster days or on an ad-hoc basis.

Some teachers were able to pair up with literacy and Ultraset coaches, as well as cultural partners (zoo, museum, gallery, state library experts) to achieve better outcomes from blended learning projects.

Technological Challenges

The schools were provided with a grant to enable them to purchase devices. However, in all cases, the grant was not sufficient to support one-to-one access. Teachers employed techniques to enable devices to be shared - by having class sets and using rotations and/or by sharing device functionality through headphone splitters or interactive whiteboards, or assigning collaborative tasks that require sharing e.g. GPS and geocaching activities. It was very common for a number of technologies to be used within the one task. On the whole students viewed access as a privilege and worked hard to keep it.

Teachers reported that technical support was generally available and is becoming less of an issue because devices are becoming more intuitive, teachers are offered professional development and most schools have some allocation of funds for technical support. Both students and teachers acquired more knowledge of the devices through these collaborative teaching reduced the reliance on one teacher problem-solving technical issues. Access to technical assistance and ICT training opportunities remains an issue for some educators. *Ping (2009), Floating Worlds (2009-10) and Chinese Language Learning With Web 2.0 (2009)*. These projects identified a number of technological issues that needed to be resolved: A lack of bandwidth and IT support; web proxies and internet filters impacting on program delivery; and the cost of student access to the internet. Ping also identified the need for improved audio fidelity to avoid compromising. The quality of voice and musical instruments. Some of these issues have been resolved by higher bandwidths and changes to the standard operating environment by using eduSTAR and the Ultranet.

Ping (2009) In the schools, the lack of broadband bandwidth and IT support were issues that hindered the rural schools use of digital resources. Web proxies and filtering of internet content also had an impact upon the delivery of Ping into some schools. Schools also underestimated the amount of bandwidth required to run the Ping project.

School practices, such as charging students for internet access, had an impact on all students fully participating in the

Ping program. The three participating secondary schools all charged their students for bandwidth. This affected student learning and the outcomes of the project.

Floating Worlds (2009-10) Official school broadband speeds appeared adequate, however most participating schools reported that if a whole class was engaged in interactive internet use the broadband speed slowed to a crawl. This limited the capacity of schools to make optimal use of Web 2.0 technologies.

Some schools set a financial limit on students' downloads and then charge students for any further costs. Where online resources are recommended by the Department, this should be accompanied by advice on how to minimise or remove the financial burden on students.

Chinese Language Learning With Web 2.0 (2009) ,The teachers reported mostly positive experiences during the trial, however all four encountered difficulties in the integration of Web 2.0 tools in the language classroom due to a variety of technical and policy issues including :

- (a) training in the relevant ICT skills
- (b) familiarity with Web 2.0 tools
- (c) a commitment to collaboration and student-centred learning that should underpin the languages program
- (d) sufficient class access to the internet and relevant hardware
- (e) sufficient time for professional learning, program planning and resourcing.

Student Preparation- Support- Transition

It's not only the teachers who need support for the transition to a blended learning environment. Students also need preparation and support for the transition to becoming more independent learners and self-managers.

Support for Students – the role of the wider workforce including paraprofessionals Díaz and Entonado (2009) noted that the important role of teachers in blended learning is in „facilitating of the teaching/learning process, combining the

explanation of theoretical contents with activities and encouraging interaction .

Students also required additional assistance in understanding internet protocols especially those of cybersafety and intellectual property. Intercultural understanding was also an area that required guidance.

Students can also engage expert non-teachers (para-professionals) to assist with specific content teaching, for example scientists, especially through the use of Web 2.0 technologies.

Assessment Considerations

The way in which teachers assessed student outcomes in these blended learning changed, *for example* :

- (a) teachers were able to assess many more skills than just traditional literacy (*e.g.*, reading, writing) in activities such as digital story creation *e.g.*, group work, media literacy and technical editing skills
- (b) technologies that enabled frequent feedback (online quizzes) allowed for differentiated intervention
- (c) engaging students in creating their own podcasts, films and games allowed teachers to assess deeper conceptual thinking and creativity
- (d) monitoring using ICT was often instantaneous and timely, offering immediate opportunities for remedial action
- (e) collaboration and peer review became part of the formal assessment using ICTs especially through blogging, discussion boards and film making and this encouraged better performance
- (f) assessment criteria in these projects were also more transparent to students (possibly due to the use of rubrics), raising expectations in performance
- (g) the public nature of students work and having an authentic audience (through blogging, web pages, online chat etc) made students more aware of social etiquette,

the need to present better products and encouraged healthy competition between students raising academic achievement.

Culture and Innovation

The system and cultural influences on student performance, teacher practice and device access were profound.

Leadership and Peer Support

Teachers are encouragement from their school leadership and peers. Some principals came to visit the classrooms, provided extra time release. Peers showed support by showing interest providing encouragement/ assistance and by creating an expectation that there would be a flow-on effect across the school. This raised expectations, empowered teachers and students, contributing to better outcomes.

An Innovative Culture

A culture that encouraged innovation was typical for the success of these blended learning projects. In general the culture was accepting of change and risk and looked to overcome issues and to challenge students to do better.

Adopting a blended learning approach offers the appeal of combining different learning elements using the power of ICT while retaining a human touch.

A blended learning model should describe a planned and deliberate educational activity that integrates student-centred learning, classroom-based teaching and learning with mobile and web-based online approaches based on individual learners and their specific needs.

Learning initiatives such as the Virtual Learning as well as the Rural Education provision initiative are all based on the need for online learning infrastructure, policy and practices to facilitate 21st century learning.

The Ultra net supports providing online collaborative spaces, tools and digital resources in a state of the art 21st century

learning environment that enhance the physical classroom. This provides opportunities for students, parents and educators to share information collaborate and engage in learning in a secure space. The Ultra net provides seamless asynchronous and synchronous e-Learning environments to all Victorian Government schools.

There is a growing worldwide trend in initiatives that are explicit about the availability of learning anywhere, anytime. The underpinning notion is that teachers will need to be up skilled quickly to cope with the virtual learning opportunities in the classroom.

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 14. A profile of the San Francisco Flex Academy is available at "Flex Public Schools: San Francisco Flex Academy in partnership with K-12, Inc.," Innosight Institute, <http://www.innosightinstitute.org/blended-learning-2/blprofilesinnosight/flex-public-schools/>.
 15. A profile of QCSD is available at "Quakertown Community School District: Infinity Cyber Academy," Innosight Institute, <http://www.innosightinstitute.org/blended-learning-2/blprofiles-usersubmissions/quakertown-community-school-district-2/>.

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