

## **A New Approach on Blended Learning Instructional Design: The Case of BLENDLEE<sup>1</sup>**

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### **Abstract**

Despite the emergence of new learning technologies, the field of competence development has suffered from a lack of effective methodologies and frameworks that integrate current technological, professional, organizational and experiential requirements. Traditional unitary approaches have faced challenges when trying to cope with the complexities of competence development in project management. Using a case study as a background, this paper presents a new and innovative way of creating blended learning instructional design and the results of its application on a module in a master's course on project management. The hypothesis is that factual information can be delivered using computer-based instruction (online) - as declarative knowledge held by students - whereas face-to-face time is saved for deeper social learning experiences.

**Keywords:** *blended learning, project management, project management skills, skills' development, contextualization, scenario-based learning, situated cognition*

### **1. Introduction**

Nowadays, the market demand for highly applicable skills is more dynamic than ever and, as a result, educational institutions and training providers face the challenge of adapting their approaches to a more performance-centered learning that combines both efficiency and effectiveness and focuses on these dynamic market demands.

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In pursuit of answers to this challenge, blended learning, as an approach to instructional design, has recently gained the attention of educators [1] [2]. In its simplest form, a blended learning course combines the best elements of two other approaches, online and live or lectured instruction, while also seeking to address some of their limitations [3]. Blended learning (or blended instruction) can benefit from both instructional methodologies, while the ways in which teachers are applying blended instruction in the classroom are becoming increasingly varied.

However, the simple combination of online and face-to-face sessions has so far not been proven to provide the expected efficiency and effectiveness from the point of view of performance-centered learning. The design of blended instruction can represent the difference between the development of high performing or low performing professionals. When developing an efficient and effective blended learning course, the following points should be considered:

- How is the content created?
- What types of content are offered?
- In what amount and with what frequency are they offered?
- Are the new roles and responsibilities of the instructor adapted to the new approach?

A new approach to blended learning instructional design was developed and used in the module Introduction to Project Management of the European Master's in Project Management (EuroMPM) from the University of Applied Arts and Sciences, Dortmund.

Although other benefits were also observed, the main goals of the project were:

- To raise the learning performance in terms of a holistic understanding of project management, levels of information retention and students' practical skills.
- To offer more flexibility in teaching and learning.

## **2. Challenges in the development of project management skills**

The development of project management skills is especially challenging [4] [5] as they require a particularly high amount of hard and soft skills as well as good decision-making and problem solving abilities. The inherent complexity of projects demands that key capabilities [6] be developed and present, even under immense pressure and stress. A lack of previous experience in this area on behalf of the learner can make achieving an understanding of the abstract nature and concepts of project management a particularly challenging task, making this an extremely difficult discipline to teach. Due to the nature of the competences required in such complex project scenarios, Egginton [7] has highlighted the need to hone specific professional behaviors which can only be attained through experiential learning [8]. Therefore, the approach to be taken in the *blendlee* case should not only be blended, but also be as experiential as possible.

### 3. Overview of the course structure

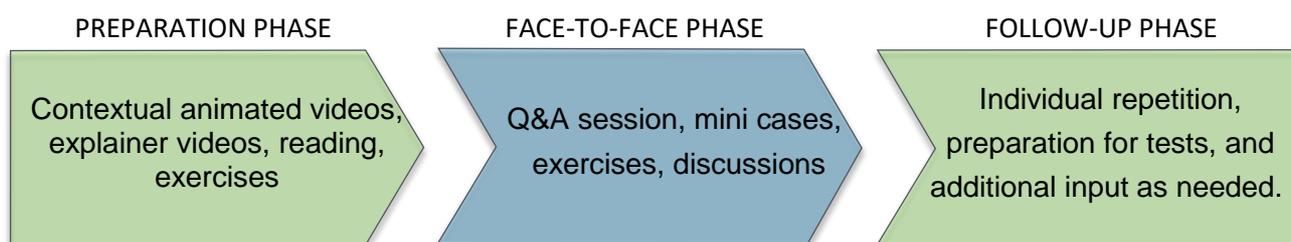
The structure of the course follows a basic three phase approach to each face-to-face encounter, which the authors call cycle or iteration. The students access the online content prior to the face-to-face sessions as a preparation segment and also after these sessions as a follow-up or consolidation segment. A diagram showing the basic three-part structure which forms the design of the course is given above (the online activities in green and the face-to-face activities in blue).



In summary, this blended approach to course design was shown to be an effective instructional strategy, providing a way to guide the students in practicing and organizing their knowledge.

### 4. Learning elements used

Part of the success of the course can be attributed to the types of learning elements used and the way they were developed. Each element is presented to the students at specific points in time and fulfils specific didactical purposes. The following list depicts the types of learning elements and the phase in which they are used:



It is important to mention that not all learning elements are used in every cycle. The decision regarding which elements to use depends on the complexity of a topic and its length. Additionally, some elements, such as discussions, were shown to be more appropriate only after a certain number of cycles as only then were students able to create the relevant connections between them, allowing them to engage in the discussions. In the following table, the online and face-to-face activities are explained in detail.

Online activities and learning elements	Face-to-face activities and learning elements
<p><i>Animated story videos</i></p> <p>Short animated videos with the purpose of offering, through storytelling, the characters, real world examples and context to the topic.</p>	<p><i>Professor's deeper explanations to content</i></p> <p>Here students have the opportunity to hear the professor's deeper explanations on the topics they have already seen in the preparation phase.</p>

<p><i>Animated explainer videos</i></p> <p>Fundamentally based on motion graphics, these are short animated videos that seek to explain concepts at a detailed level.</p>	<p><i>Professor's answers to questions (Q&amp;A)</i></p> <p>A 'questions and answers' session in which students are able to ask questions and the professor can ask questions of the students.</p>
<p><i>Professor videos with animations</i></p> <p>As with the animated explainer videos, the animated professor videos offer deeper explanations for the concepts. The videos also feature additional motion graphics to help illustrate the explanations.</p>	<p><i>Professor's field experience</i></p> <p>Offers students insight from 'within' the relevant life experience. In a non-blended approach this is possible, however there is usually not much time. In the blended approach there is more time because part of the content was given in earlier activities.</p>
<p><i>Third party readings</i></p> <p>These readings, from different authors and publishers, offer students a broader and deeper perspective of the topics.</p>	<p><i>Discussions</i></p> <p>Guided by the professor, students express their understanding, agreements and disagreements. As students have already received content, there has been time for their brains to assimilate the information and develop connections so that they can build their own points of view. Thus, the level of participation is high and discussions are rich in valid arguments.</p>
<p><i>Professor readings</i></p> <p>Those are texts written by the professor.</p> <p>Under the same category of learning elements there are also slides created by the professor.</p> <p>Specifically, these texts and slides could offer special insights from the professor's perspective, thus customizing even more the course.</p>	<p><i>Group work: mini case studies</i></p> <p>Unlike the online mini cases, this exercise is focused on team work rather than sole knowledge. Students exercise their social, argumentation and analysis skills under pressure.</p>
<p><i>Peer review</i></p> <p>Exercises in which students analyze and evaluate other students' work (e.g. answers to questions; report). Each student checks at least two other students' work, allowing them to gain different points of view.</p>	<p><i>Online test</i></p> <p>Under time pressure, students answer questions related to a group of topics. Grades are received immediately after test completion. They can also reexamine their answers to know which questions they did not answer well and in which they marked the correct answers.</p>

<p><i>Online exercises</i></p> <p>These are not graded exercises. Their purpose is for the students to be conscious of how well they have understood the content. The exercises offer automatic feedback and are a tool for spaced repetition. Different types of questions are used, including true/false, multiple answers and drag-and-drop.</p>	
<p><i>Online mini case studies</i></p> <p>Students are presented with fictional and non-fictional cases, which they analyze, answering questions, proposing solutions and preparing for class discussions.</p>	

## 5. The role of the professor

Until fairly recently, students received most of their knowledge from professors. As technology became more commonplace and information more democratic, students started to have more control over their pace of learning. However, even with the added technology, students still feel the need for the instructional dynamic of being guided by the professor.

With the blended learning approach presented here, the professor was no longer bound by the need to present the instruction in its entirety, thus leaving more class time to dive deeper into the topics and focus on personal interactions, expert opinion and exercising through case studies. Furthermore, the professor was better able to circulate among and interact with the students, allowing him to observe them more closely, detecting individual problems and providing timely feedback and guidance on class work or home assignments. The professor also served as a catalyst for student discussions, bringing his own experience to the debate and asking tough questions to further stimulate students' thinking. This intense level of interaction also allowed the professor to develop a stronger rapport with the students.

Thus the role of the professor shifted to that of a mediator, a coach or mentor. By offering this environment of contribution, this particular blended learning approach also gave students a greater control and a more active role in the learning process, contributing significantly to student motivation and interest in class. Furthermore, by arriving at the class already in possession of a good notion of the topic, students have more confidence and participate in an active manner, unlike the passive learning experienced during the pure acquisition of knowledge. Overall, students' trust and self-confidence increased, while a change in the students' views regarding the professor was perceived, moving from that of knowledge-master to that of a mentor.

Worth mentioning is the fact that this kind of teaching approach was only possible because, for every cycle, students had already spent time, during the preparation phase, building an understanding of the context surrounding the project management topics.

## 6. Research in cognition to support the development of more effective trainings

Based on, among others, research in cognition, memory and learning performance, the approach offered contained a number of strategies in improving learning performance. Below the authors describe some of the key components, namely: situated cognition, avoidance of information overload, influence of sleep, influence of social interaction and spaced repetition.

### *Contextualization and the situated cognition*

One of the pillars of the methodology was Kindley's [9] concept of situated cognition, which suggests that the best learning process takes place in the context in which it will be used, based on the idea that it is then easier to fully understand the information. This can further be connected to previous knowledge so that it is better acquired and retained.

In addition, attention is closely related to meaning which is, in turn, closely related to the retention of information. Thus, content must be meaningful in order for students to engage with it [10]. The combination of images, sound and text in a story attracts student interest and enhances learning achievements [11].

There is also evidence indicating that emotional arousal has an effect on memory systems and on behavior [12] [13]. Chemicals active during emotional arousal, such as adrenaline and especially norepinephrine, are involved in attention and in the consolidation and retrieval of memory.

Finally, storytelling can also be used to enhanced situation cognition. According to Schank [14], storytelling is an effective instructional strategy that promotes learning motivation and improves student learning performance. Other authors [15] [16] emphasize that digital storytelling is key to promoting learning achievement and should be merged with the curriculum in order to achieve the teaching objectives.

Shown below are some screenshots of the animated videos offered online for the students during the preparation phase.



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In the methodology, the elements of context and meaning were integrated through the use of animated story videos offering examples of real-world situations. The challenges posed when creating context-rich training can thus be overcome with such videos as they make meaningful patterns, elicit emotions and demonstrate the relevance of the topics to the audience. In addition, animated stories can fill an emotional gap in a way that ‘hard facts’ cannot. We should, however, emphasize that the objective of the animated videos was not to serve as transmitters of knowledge or to replace other forms of knowledge transfer (e.g. by the professor or through reading). Their focus is rather to prepare the ground by offering context and leading students into a welcoming emotional and cognitive state that facilitates the uptake of the information presented.

### *The avoidance of information overload*

Information overload is a common occurrence in traditional forms of instruction. If the student is presented with too many facts and figures, then the capacity to retain these is overwhelmed and the brain must discard information which does not ‘stand out’. Thus, at some point, the student is no longer able to absorb or even understand the information presented, leading to low performance [17]. This represents a significant waste of time and resources on behalf of both the student and the professor and should be avoided. To solve this challenge - i.e. to eliminate the waste – the following strategies were used:

- All unnecessary information was identified and then removed from the learning content.
- All remaining necessary information was sliced into smaller chunks of information.

The blended approach to this case study proved to be very efficient with regards to keeping students’ attention and not overwhelming them with information. Small pieces of information were made available online and students had the opportunity to absorb small daily intakes. Additionally, during the period of the course design, several pieces of information were identified as either unnecessary or at least lacking the added value that would justify their inclusion in the core material.

### *‘Sleeping on’ important information*

There is a broad scope of literature on strategies for improving the retention of information or long-term memory. There is a consensus [18] [19] [20] that sleep positively affects memory as meaningful connections are created during deep sleep. The strategy of ‘sleeping on’ information can be very effectively used in conjunction with the slicing of information. Thus, information overload is not only avoided, but also students have the chance to sleep between information chunks.

Although the influence of sleep in retaining information is widely known, it is still rarely used in course design and courses still focus on offering as much information as possible within the class period. However, when trainees are able to ‘sleep on’ the information given, this gives their brains a chance to solidify the content [20]. Findings [19] support the hypothesis that recently acquired information is actively restructured and strengthened during sleep, suggesting

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that REM sleep is deeply involved in the reprocessing and optimization of the higher order information contained in the content delivered.

During classes, it could be observed that students were able to not only recall information given in the preparation phase, but also make several associations, which could be attributed to the findings of Peigneux [19], that is, information is restructured and strengthened during sleep.

### *Spaced repetition*

Spaced repetition takes place when students have the opportunity to repeatedly review the same information, preferably in a variety of means. It is known that information that is not repeated is lost [21]. This effect is illustrated by the so-called ‘forgetting curve’ [22], which pictures the decline of memory retention in time.

Information that is lost represents a significant waste in financial terms, temporal aspects and in missed opportunities. People tend to forget facts and figures which are not stored in the procedural (habit) memory.

Spaced repetition acts positively on all memory systems (declarative, working and procedural memory) and has a powerful effect on the ability to retain information [23].

Additionally, research supports the hypothesis that repeated information favors the procedural memory system. This corroborates the idea that trainees who participate in training sessions which value procedural activities (active and emotional) are able to perform accordingly in the future, even in stressful situations [13] as it broadly reflects a rooted procedural memory.

The design of the course, divided in three phases, allowed students to view information at least three times and in different forms (video, text, discussions, exercises).

## **7. Results and Conclusions**

In summary, the blended approach used incorporated the following main characteristics:

- It was divided into phases:
  - preparation
  - face-to-face
  - follow-up (or consolidation)
- It possessed a diversity of learning elements, according to
  - each phase
  - the desired cognitive levels
  - each learning objective
- It was highly social and included
  - discussions
  - questions and answers

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- case studies
  - peer review
  - It was based on research in cognition
    - contextualization (situated cognition)
    - avoidance of information overload (chopping of information)
    - sleeping on information
    - spaced repetition

As a result of this particular blended approach, a highly constructivist and cooperative learning environment was observed in the class and students were fully engaged both in the discussions and in solving the case studies. Difficulties in promoting a proactive and cooperative learning environment among students were not present. Moreover, students showed constant motivation and a consistent concentration on the learning tasks.

A usual challenge to blended approaches lies in the common non-completion of the out-of-class activities by the students. This behavior, however, was not observed during this course as most students (> 80%) accomplished the online activities. A reason given by students for completing the online activities was that they were ‘interesting’ and, in most cases, ‘short’, such as in the case of the videos, which varied in length between 1:30 and 3:30 minutes. Nonetheless, students reported having taken more than two hours, between researching and writing, to accomplish some of the more challenging activities.

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The end-of-course questionnaire presented following numbers:

95%

The content motivated to learn, encouraged further research and helped understand the topics.

100%

Would like to repeat the same blended learning experience.

95%

Became even more interested in the subject of project management. (This means that if they were interested, or even if they were not very interested in project management, they became more interested after attending the course using *blendlee*'s approach).

At the end of the course, the authors gathered the following list of advantages and disadvantages of the approach.

*Cons:*

- ◆ Creation of the course design and the material is time-consuming and relatively challenging
- ◆ Creation of the material requires a high level of customization
- ◆ Maintenance of the material is laborious

*Pros:*

- ✓ Positive learning outcomes for the project management topics
- ✓ Motivation and engagement for students
- ✓ Motivation for the professor - classes become more interesting and dynamic
- ✓ Possibility for the professor of re-using the material in each semester
- ✓ Scalability – content can be used by any number of professors and classes
- ✓ Quality level standardization - students receive the same base material, independent of institution or professor
- ✓ Flexibility - content can be used in its totality, partially or mixed with additional material given by the professor

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The main areas of interest and research:

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- Applying project management methods in start-up business development
  - Agile in non-software development projects
  - Cross-cultural project teams' management
  - The importance of cultural intelligence in project management
  - Public and cultural diplomacy

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