Web-Based Learning in the Swedish Armed Forces

- a guidance

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It is my great pleasure to write the foreword for"Web-based Learning in the Swedish Armed Forces – A Guidance". With this book, the Swedish Armed Forces aim at a position in the forefront of adapting to a changing world, where technology and digitalization have become increasingly integrated into our lives.

In 2013, when the Swedish Armed Forces implemented a new and more effective learning platform, there was also a need to describe in text how to work with web-based learning. Even though the teachers and instructors were both ambitious and capable, there was a skepticism about the technological development that took place in the field. The self-confidence that was very evident in the classroom was not as obvious when it came to using the Internet as a place for learning. The teacher and instructor role was simply changed and had to embrace facts as:

- The web as a meeting place for learning
- Learning together online
- Teaching online
- Using digital learning resources

"Web-based Learning in the Swedish Armed Forces – A Guidance" provides an insight into how the Swedish Armed Forces use online learning methods to improve education, training, and development of personnel. Some of the examples are guided towards Swedish military praxis and may not be directly transferable into your organization. However we hope that this book can act as an inspiration to teachers and instructors also within collaborating nations.

I would like to thank all the authors and contributors for their work and dedication. I hope that the book will be an inspiring read for military personnel, as well as for anyone interested in web-based learning and how technology can be used to enhance knowledge and skills.

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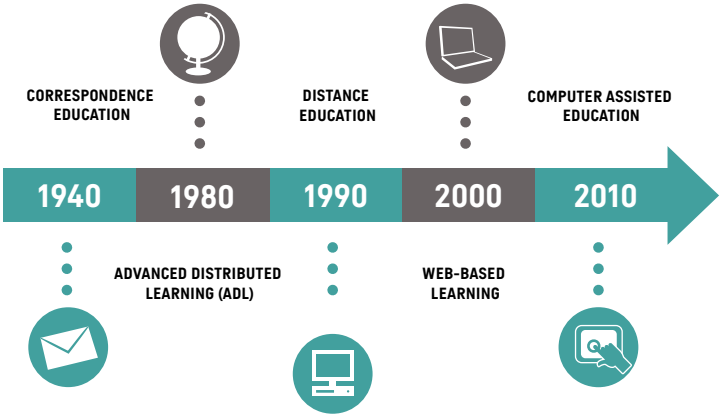
INTRODUCTION:
FROM DISTANCE EDUCATION TO WEB-BASED LEARNING

This book is about how the internet can be used to support adult education and how online technologies and methods can be used to create greater flexibility in learning. It has been written with employees of the Swedish Armed Forces in mind and is primarily intended for teachers and instructors training students (officers, soldiers, airmen, sailors, and recruits) in training units, schools and centres. It is hoped that Web-based learning in the Swedish Armed Forces will provide support for teachers and instructors and create pedagogical awareness of the opportunities offered and challenges posed by online teaching activities.

The Swedish Armed Forces has long harboured the ambition of making study programmes and courses more flexible and of giving employers greater latitude to plan and control their own learning. As early as the 1940s, the Swedish Armed Forces Correspondence School was offering courses to both military and civilian personnel in subjects ranging from target analysis and leadership psychology to languages and Physical Education (PE). Although courses for civilians were phased out, correspondence courses in subjects such as history, engineering and tactics continued to be offered to officers in preparation for higher education.[1]



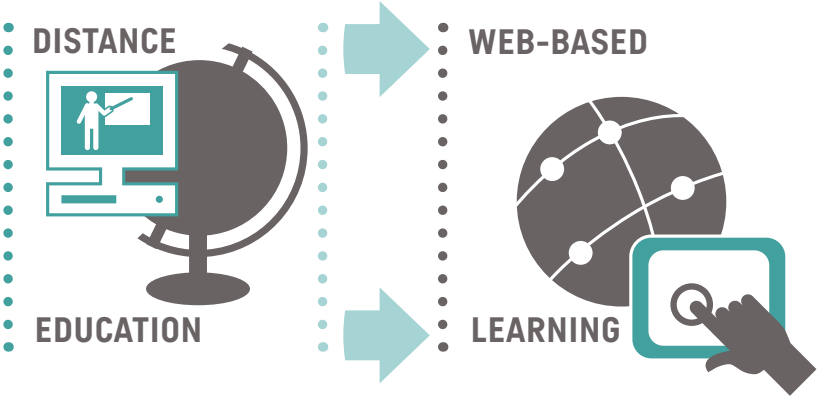
As new pedagogical experience was acquired and technology developed apace, so the nature of correspondence courses offered by the Swedish Armed Forces changed. From the late-1980s onwards, it became increasingly common to refer to distance education as a means of streamlining training and by the early 1990s new computer technology was raising hopes that this would become a reality. In fact, as the speed and connectivity of computers increased, it was even considered likely that the classroom model of continuing professional development would eventually disappear.[2]

During the 1990s, distance education was discussed as one of several forms of education utilised by the Swedish Armed Forces and the use of terms such as computer-assisted learning underlined that functioning technical solutions were considered a prerequisite for successful distance education. There was a clear need to facilitate contact between teachers and students, and to support the teacher's role as a supervisor and the student's ability to learn independently and critically. That said, a large proportion of the Swedish Armed Forces' staff lacked knowledge and experience of distance education and the method was often greeted with scepticism.[3]

The first years of the twenty-first century saw a new term enter the vocabulary of the Swedish Armed Forces: advanced distributed learning (ADL). Initiated by the United States Department of Defence in the late 1990s, the Advanced Distributed Learning (ADL) programme was intended to allow defence personnel to learn anywhere. One pillar of the ADL programme was that personnel could access digital learning resources, individually or in groups, and repeat learning activities later should the need arise. As the Shareable Content Object Reference Model (SCORM) was used as the universal standard for learning resources, they could be recycled in new learning activities and integrated with other digital learning platforms.[4]

In the Swedish Armed Forces, ADL quickly became synonymous with one specific type of digital learning resource – standardised, self-instructional e-learning packages. The term web-based learning was later adopted to highlight the diversity of learning activities that the Swedish Armed Forces could offer thanks to information and communication technology (ICT). This term encompasses all forms of learning supported in one way or another by the internet. It is also a term that, unlike ADL, is widely used in civil society by both educators and researchers.

The evolution of distance learning into web-based learning reflects a pair of shifts in how the Swedish Armed Forces views its educational activities. This is made clear in the following diagram:



This diagram first shows a shift from distance education to online learning activities. Initially, the need was expressed for technical solutions that could bridge the gap between teacher and student and ICT was primarily viewed as an opportunity for increased interaction and more in-depth collaboration in the Swedish Armed Forces' distance education. These days, online technologies and digital learning resources are also used in other forms of education. There is an awareness that a collaborative tool such as a discussion forum can also make on-campus teaching more flexible and effective. Regulations and other course literature are distributed digitally and instruction videos are recorded and made available to students. So, the perspective has been expanded; the internet is no longer simply a resource for distance courses but for all teaching activities.

Over the years, we have also witnessed a shift from education to learning. Today, we acknowledge that people are capable of developing knowledge in any number of situations, not simply by attending courses and study programmes at one of the Swedish Armed Forces schools. The ability of the individual to solve problems during a mission – whether alone or together with others – has become increasingly important and the training and exercises that prepare them for missions are far from confined to a programme or course at one of the Swedish Armed Forces' schools. Learning also takes place in the field with their unit, and there is every reason to view the knowledge development of personnel from a broader perspective.[5] Shifting focus from teaching to learning increases opportunities for online education. Online technologies do not solely benefit military personnel, they support lifelong learning for all employees of the Swedish Armed Forces.

In other words, web-based learning should be viewed as a broad term that encompasses a range of technologies and approaches that are continuously being added to. Blended learning, which combines traditional classroom teaching with online learning activities, is commonly advocated to create greater flexibility and variation and foster independent students. The idea is that carefully considered elements in varying learning environments should stimulate more students and increase their opportunities to plan and regulate their own learning; however, rather than simply

allowing them to decide where and when they learn, they are encouraged to set their own targets and select appropriate strategies to achieve them.[6]

Another method that has been much-discussed in recent years is the flipped classroom, and this provides another example of the arrival of the internet into classroom teaching and the expectation that students will take the initiative and control over their own learning process. In the flipped classroom, no time is wasted on introductions or breifings, as in traditional teaching. Instead, students prepare at home by watching pre-recorded lectures, taking online quizzes or reflecting and discussing the topic in an online forum before they arrive in the classroom, so that when they meet the time can be spent on exercises, analysis and feedback. The flipped classroom also presupposes that students will shoulder greater responsibility for their learning, so that time once spent on introductions can be used for classroom activities that deepen the student's knowledge in various ways. So, the internet is allowing us to innovate pedagogically in the classroom as well.[7]

Four chapters follow this introduction to the shift from distance education to web-based learning. In the first chapter "Learning online", we look at the internet as a forum for learning. First, we look at the Swedish Armed Forces' basic pedagogical approach, which should permeate all learning activities conducted by the authority. We then discuss the pedagogical ideas that underly many of today's online technologies and methods and how we can create a stimulating, secure and accessible online space where people can learn individually or in groups. The chapter concludes with three sections describing the organisational conditions, technical solutions and pedagogical support functions for web-based learning in the Swedish Armed Forces.

The second chapter, "Learning together online", focuses on human collaboration and interaction. The chapter considers various types of online learning communities and describes a few common collaborative tools in the form of blogs, discussion forums and online meetings. Each tool has its pedagogic possibilities and problems, some of which are discussed in

the chapter. These days, we all also see social networks pressed into service to support online learning, so we also look at some of these platforms: Facebook, YouTube, Twitter and Instagram.

In the third chapter of the book, "Using and developing digital learning resources", we discuss working with digital material as a learning resource. The chapter begins with a discussion of copyright and what to bear in mind when, for example, downloading images and videos from the internet for use as teaching materials. A section follows on where to find assistance in producing your own digital learning resources. Finally, we offer a few examples of more advanced learning resources currently used by the Swedish Armed Forces, such as apps, games and simulations.

The book's fourth chapter, "Education and training online", is primarily aimed at teachers and instructors looking to pedagogically develop their courses and use the internet as a learning space. It begins with a few thoughts on the role of the teacher and instructor in web-based learning, followed by a discussion of three factors for success: that the course is well-structured and well-thought-out pedagogically, that students receive good tutoring and that the teacher or instructor has a detailed strategy for supporting and motivating students. The chapter also examines five phases that a teacher or instructor can systematically follow when organising online courses: analysis, design, development, implementation and evaluation.

The book concludes with a reading guide for those interested in deepening their knowledge of working with web-based learning.

CHAPTER 1
LEARNING ONLINE

The rapid development of information and communication technology has fundamentally altered the conditions for human learning. These days, it comes completely naturally to many of us to use the internet as a learning resource. Public authorities and other organisations are also increasingly seeing the opportunities and benefits of creating online learning activities for their employees, and the Swedish Armed Forces are no exception. Creating military units with strong operational capability and doing this in a time of growth of course affects the educational activities, and the web looks to become an increasingly important component to be able to provide different personnel categories and stakeholders - not least part-time serving soldiers and sailors and members in the voluntary forces – the training they need. Everything suggests that the internet will also be a natural and self-evident learning space in a modern conscription system.

This chapter begins with a description of the Swedish Armed Forces' basic pedagogical approach, which should permeate all learning activities conducted by the authority, including online. We then discuss the internet as a forum for learning more generally, including the pedagogical ideas underlying today's online technologies and how we can create a stimulating, secure and accessible online space. The chapter concludes with three sections describing the organisational conditions, technical solutions and pedagogical support functions for web-based learning in the Swedish Armed Forces.

The Swedish Armed Forces' basic pedagogical approach

The Swedish Armed Forces' basic pedagogical approach shall permeate all educational activities within the Swedish Armed Forces. The pedagogical approach is formulated in the textbook Pedagogiska grunder (2006, 2022).

Every teacher or instructor who organises teaching activities within the Swedish Armed Forces has a responsibility to relate to this basic approach when developing their own attitude to knowledge and teaching.[8]

The theoretical foundation of the Swedish Armed Forces' basic pedagogical approach is constructivism. Rather than being a product, knowledge is considered as a process through which the individual constructs their own knowledge. The quest for knowledge is driven by the tension that arises between what one wants to achieve and what is possible with the knowledge currently at one's disposal. Tension spurs learning; it raises questions and stimulates the individual to close the gap between their new knowledge goal and their current knowledge in various ways.

So, learning can be viewed as a process of developing and deepening our understanding of a problem or phenomenon. We will often have our own ideas about what we read or are shown. A study programme or courses is thus an intervention in an already ongoing knowledge process. Teaching is only one of many factors that affect the development of the individual's factual and tacit knowledge, comprehension and competence; it is part of a process that does not end with an examination. Developing new knowledge – learning – implies altering one's mindset and this takes place in encounters with other people's ideas and interpretations.[9]

Without context, learning is rarely meaningful and the knowledge the individual acquires can easily be perceived as disconnected and fragmentary. Learning is of course shaped by its physical context. It is far easier to utilise knowledge if it is learned in a situation similar to that in which the individual will later be expected to act. A learner driver will develop a better understanding of the hazards of driving on icy roads in one driving lesson on a skidpan than any amount of reading about how to handle a slippery curve.

Learning is also shaped by its social context. If the individual feels secure enough to share their thoughts and ideas, a culture of collective knowledge-building can be created from which knowledge will grow that is different to or more than the sum of the groups' knowledge. When individuals share their experiences and mindsets during exercises and discussions, individual knowledge is transformed into common knowledge; collaboration is characterised by collective knowledge-building and joint capacity for action.[10]

For officers, soldiers, sailors and recruits, knowledge is a toolkit for problem-solving and taking action. Here, it is important to be able to see for oneself which tools should be used in which situation, and to know how to use them. They may be skills, such as the ability to replace the magazine in a weapon, perform mathematical calculations or plan an exercise and analyse the risks involved. It may be familiarity with a given situation, so that one can utilise previous experience and make well-founded assessments of new but similar situations.

It is vital that the individual plays an active role in their learning process and has a clear understanding of why they need to learn something. This presupposes an intention on the part of the individual to reflect on the content of a lesson, see its context and meaning, choose their own approach and relate it to their own experiences. This stands in opposition to a learning process in which the individual focuses on external demands from a superior, a teacher or an instructor, from regulations or the anticipated questions in an examination. In which case there is a risk that the learner will fail to grasp the point of learning and that the content will not be perceived as either particularly relevant nor interesting.[11] To learn to successfully act and perform tasks, one must first understand why and to what ends one is learning.

The internet as a forum for learning

For a long time, the contribution of computers to learning was to allow students to follow teaching activities alone based on self-instructional study materials. However, the rapid development of information and communication technology over recent years has made it possible to apply pedagogical ideas centred on the social aspects of learning. These days, a great many online learning activities are based on social theories of learning.[12]

There is no real conflict between a social and a constructivist understanding of knowledge development. For example, from a sociocultural perspective, it is the individual who constructs knowledge, even if learning always takes place in a context and in a situation that shapes both the learner and the subject of instruction. The point of departure for sociocultural learning theory is, in other words, an understanding of people as social and cultural beings who acquire cultural tools (e.g., language and symbols) and learn to use them through social activities. It is in interaction with other people that one develops knowledge, honing ideas and arguments to make possible a deeper and broader understanding.[13]

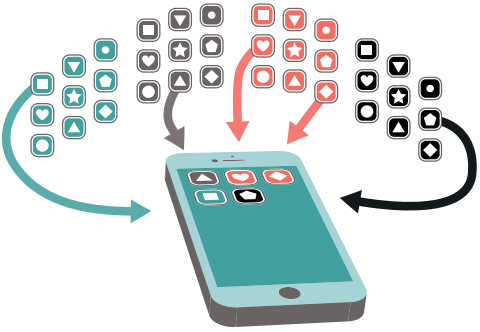
The fact that people are social creatures also affects how we learn. Interacting with others stimulates learning.

There is broad agreement among researchers that group learning activities have a positive impact on the learning process. This is particularly true of web-based learning.[14] Online dialogues of various kinds create a sense

of security and community. They also stimulate reflection and encourage participants to share their own and absorb other people's experiences.[15]

That said, web-based learning need not be a group activity. One advantage of placing learning activities online is that it allows for greater flexibility. The learner can study independently at a time and place of their choosing and in manner and at the pace that best suits them. This kind of freedom generally has benefits for both organisation and the individual.[16]

One should, however, be aware that completing learning activities alone online places certain demands on the student in terms of maintaining interest, motivation and self-discipline if good results are to be achieved. Self-study also places high demands on learning activities, which must be interesting and stimulating and find different ways to make the student reflect on what they are learning. Microlearning is an approach that has had some impact over the past decade. The term covers brief learning activities that discard superfluous information to concentrate on the essence of the content. In a society where time is at a premium, microlearning may be one way to streamline the learning process. When information is portioned – for example, in short videos – rather than being published as one long text, for most people it becomes easier to absorb. If, in addition, the content is interactive and feedback rapid, the conditions for learning are improved even further.[17]



Where learning happens is becoming increasingly individualised. New types of devices also place demands on how study material is made available.

While the internet can support more formal learning in study programmes and courses offered by the Swedish Armed Forces, it is also useful for more informal learning situations in working life, such as networking, coaching, mentoring and other continuing professional development activities. Learning is a natural process in many workplaces and it is important to underline that the internet works splendidly for exchanging experiences and problem-solving within a unit or staff category.[18] While the creation of structures and processes to support informal learning is a relatively new idea, the development of intranets that provide good opportunities for collaboration and communication has created new conditions for learning in the workplace – not least for a public authority like the Swedish Armed Forces, where employees in a unit or function are not always stationed together.

Although the internet is often presented as a democratic place where people can meet on equal terms, this is not always the case. There is a great deal of research illuminating online power dynamics. Many studies suggest that women and men behave differently when they participate in learning activities.[19] Generally speaking, men write more and longer posts on online forums than women and men also express their dissatisfaction and opinions more plainly. Women's posts are in some sense more dialogical than men's; they reference other people's posts to a much greater extent and women are more likely to agree with a male contributor than men are to agree with one another. All in all, men often dominate discussions and are more likely to use authoritarian language and make negative judgements than women.[20]

According to Annette Johnsson in her doctoral thesis on online dialogues in the context of a Swedish web-based teacher training course, there is a risk that women will be silenced if the number of men involved in an online discussion increases. Johnsson's study also reveals that contributors who speak a language other than Swedish at home posted significantly less often in forums than those who speak Swedish at home.[21] Language and language use can easily become a barrier, something that anyone arranging online learning activities should be aware of and prepared to deal with.

Given that online learning does not always take place on equal terms, and that learning activities sometimes lead to feelings of exclusion, it is important to create a community of participants and encourage solidarity, openness and respect. The portmanteau word netiquette (internet + etiquette) has gained in popularity over recent years to describe the informal code of behaviour on the internet. There is every reason to think twice before posting in an online forum: Have I clearly expressed myself or is there a risk of misunderstanding? Will my message come across? The internet is a powerful tool and the written word is often taken more to heart than the spoken. The lack of body language, facial expression and voice timbre increases the risk of misinterpretation and one should therefore choose one's words with care.[22]

It should be emphasised that, in Sweden, online learning activities are subject to the Act (SFS 1998:112) concerning Responsibility for Electronic Bulletin Boards. Pursuant to the Act, the provider of online information services, such as an online course, must ensure that no messages posted on discussion forums, blogs or other areas of publication incite or contain threats to ethnic groups, child pornography or illegal depictions of violence. The same applies when it is obvious that the user has, by submitting the message, infringed on copyright. The supplier of the electronic bulletin board has an obligation to remove such messages when they become aware of them. This also applies to links to illegal content or file-sharing sites that share copyrighted material.

A permissive climate of discussion can be viewed as one of many factors in the success of web-based learning. Sense of presence is another. For example, participants need to feel that they are attending a web-based course for which someone has formulated intended course learning outcomes and planned appropriate learning activities based on those outcomes, and that someone is prepared to support them should they run into difficulties during the course. Whether or not they are conducted within the framework of a study programme, online learning activities must also reinforce the participants' motivation to learn. This demands a certain amount of variation, a reasonable level of challenge and that participants take responsibility for their own learning. The activities must also offer

participants the opportunity to apply their knowledge practically and to receive constructive and specific feedback.[23]

It is also important to ensure that web-based learning activities are accessible. If people with disabilities are to be able to participate on equal terms, the study environment must be designed to meet certain standards. One such standard is the Web Content Accessibility Guidelines (WCAG) 2.0, which contains principles, recommendations, success criteria and techniques for making web content more accessible.[24] A well-though-out user interface and the opportunity to use speech synthesis and spellchecking can make it easier for people with disabilities to participate in web-based learning activities, even if neither standards nor tools automatically confer greater accessibility.[25]

The list of success factors for learning activities on the internet is a long one. However, there are a few basic requirements that must be met. Christina Keller and Jörgen Lindh call these base factors,[26] of which they name three:

- a positive organisational culture with management that demonstrates interest in pedagogical innovation and promotes the opportunities of web-based learning
- technical systems that facilitate the organisation of web-based learning activities and qualified support that can offer assistance when problems arise; and
- that those organising web-based learning activities have pedagogical competence and basic knowledge of dealing with information and communication technology.

Keller and Lindh's base factors provide the structure of the following three sections of this chapter, which deal with various forms of support for web-based learning in the Swedish Armed Forces. First up is a discussion of organisational conditions, followed by a description of available technical solutions and, finally, a report on pedagogical support functions.

Organisational conditions for web-based learning

Championing web-based learning in an organisation that is accustomed to training officers, soldiers, airmen, sailors and recruits in the classroom presents a challenge. The Swedish Armed Forces has a long tradition of teacher-directed learning in schools and in the field and many teachers and instructors appreciate the opportunity to meet students face to face. It is often considered easier to be a role model and to help students find their place in the organisation if the teacher or instructor is physically present in the learning situation. In this regard, the very idea of creating web-based learning activities goes against the grain of the organisation's culture.

Still, there is an awareness within the Swedish Armed Forces that a new skills provision system should eventually alter how the Swedish military trains its employees. From being largely traditional educational institutions, schools must become knowledge centres that facilitate more flexible learning situations for employees, with greater emphasis on how military units can develop and retain collective competence. A small-scale interview study of military personnel from four units and researchers at seven higher education institutions confirmed that much of the education conducted in the Swedish Armed Forces is a matter of passing on information to individuals, rather than reinforcing the knowledge, skills and capabilities of the group. This education fails to give any real consideration to the context in which the student will subsequently work. One informant noted:

> The course's focus on the individual very rarely increases the capability of the group. To a large extent, in the Swedish Armed Forces it is a matter of bringing about these collective patterns of action, and this is where the majority of resources should be invested without delay.[27]

Several informants agree that the objective of educational activities in the Swedish Armed Forces must be to ensure that military units consist of properly functioning groups and that, in various ways, employees have the chance to train in collective problem-solving. This demands a more

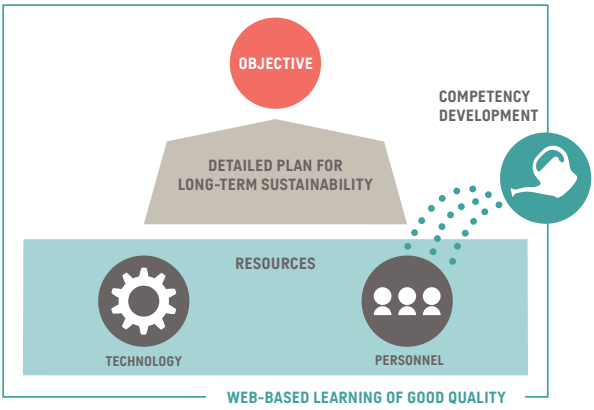
flexible education system and greater openness to blended learning environments and forms of learning. Modern information and communication technology offers a myriad of new learning opportunities; it is therefore important to ask how good conditions for web-based learning can be created within the Swedish Armed Forces on a purely organisational level.

Experience gained at other public authorities involved in education suggest that management support is often the crucial factor behind the success of web-based learning activities. Without long-term strategies and a high level of pedagogical awareness on the part of management, there is a clear risk that the commitment of teachers and instructors to and the interest of students in web-based learning will quickly wane.[28]

New ways of organising learning demand a rethink of procedures and resource allocation. One prerequisite for successfully developing web-based learning and blended learning environments is that teachers and instructors are committed to such assignments over a somewhat longer period, and that they are given opportunities to strengthen their pedagogical and technical competence. To this end, the organisation has a specific responsibility to both harness the commitment of individual teachers and instructors and allocate the necessary resources to enable them to realise their ideas.

The importance of the organisation to developing web-based learning must not be underestimated and so Brittmarie Myringer and Eva Wigforss have developed a number of organisational recommendations on how to create the necessary conditions for high-quality web-based learning activities.[29] Five of these recommendations feel especially urgent and they are reproduced here in a somewhat modified form. The organisation shall:

- have a formulated strategic objective for web-based learning
- have a plan for long-term, sustainable web-based learning
- have technical solutions that facilitate web-based learning
- have resources to develop, implement and maintain web-based learning activities; and
- offer further education in pedagogy for staff who arrange web-based learning activities



Myringer and Wigforss also underline the importance of continuously evaluating which learning activities are being offered online and the workload this imposes on those involved. As they note in their report, it is important to prioritise correctly – especially if resources are finite.

Technical solutions for web-based learning

One prerequisite for web-based learning is adequate technical solutions. This may be an intranet where the organisation's employees can share information and communicate with one another in various ways. As most intranets have a substantial flow of information that may be difficult to maintain an overview of, it is becoming increasingly common to use blogs and discussion forums to foster a dialogue that can illuminate content from various perspectives and deepen common knowledge of the organisation. Many organisations also have a separate learning platform on which employees can participate in study programmes, courses and other learning activities. A learning platform can be described as a multifunctional, password-protected learning environment that allows users to either learn independently through various forms of self-study, or to develop knowledge in collaboration with others. The Swedish Armed Forces learning platform is accessed via the internet and is primarily used by its schools and centres, although it is also used by several units.

A learning platform handles both information and communication, with the primary aim of providing pedagogical support to the organisation[30] Four important cornerstones of learning platforms are:

- ***Content pages.*** Users can see their programmes, courses and other web-based learning activities on their personal page. This also provides an overview of events in the various activities since the user last logged in. Course pages present the content of the programmes and courses the user is enrolled in. Here, teachers and instructors can upload digital learning resources such as text documents, slideshows, recorded lectures and instructional videos, add a calendar showing when activities are scheduled to take place and create a noticeboard on which to post important messages for users.
- ***Collaboration tools.*** A learning platform also provides tools for communication and collaboration between users. Users can post on discussion forums, share their thoughts in a blog, send text messages or attend digital meetings.
- ***Tests, questionnaires and submission tool.*** It is possible to create various types of tests and questionnaires, from self-correcting tests to polls and course evaluations. It is also possible for students on a course to upload written assignments for assessment and comment by a teacher or instructor.
- ***Administrative functions.*** The learning platform also has a number of administrative functions that provide an overview of ongoing activities. For example, you can check how often a user logs in, when they were last logged in, which learning resources they have used and how long they have spent on the various assignments. The learning platform can also compile users' study results for reporting to the organisation's study administration system.

So, a learning platform can be used in various ways and for various purposes. It generates a great deal of data that, among other things, can be used to follow up learning activities and provide individualised support for those enrolled in a programme or course. The term learning analytics has been widely used in discussions of web-based learning. Learning analytics is the measurement, collection, analysis and reporting of data about learners and their contexts. How often have they visited the learning

platform? How much time have they spent on each written assignment? What learning resources outside the learning platform have they spent time on? For example, have they been on the shooting range and registered the results digitally? By analysing the answers to these questions, we can extrapolate which participants appear to be struggling to achieve the intended outcomes of a learning activity and which components they are finding most difficult; in other words, learning analytics can tell us which participants need extra attention and help in order to progress in their learning process, offer ideas on how support should be designed and make us think about how we can improve the learning activity next time. With the solid foundation of learning analytics, we can better adapt learning activities to the needs of each participant.[31]

Many organisations primarily use learning platforms to disseminate information and share files. This is also true of the Swedish Armed Forces. While the Swedish Armed Forces learning platform is used to publish notices about changes to timetables and course literature. Teachers and instructors also upload documents for their students to access, the collaboration tools are used to a lesser extent. This may be because many of the courses on the learning platform are given by schools, and teachers and instructors see no need for students to communicate and collaborate online when they meet regularly in the lecture hall. That said, we cannot rule out the possibility that teachers and instructors may doubt their own ability to lead web-based learning activities. Perhaps many of them feel that they lack the knowledge to deal with any technical issues that may arise when communicating online, such as audio-visual disruption during e-meetings. After all, their focus is on teaching, not technology. Competent technical support must be available for these teachers and instructors – and indeed for other users – that can quickly analyse and rectify faults as and when they arise, or suggest measures that users themselves can take.

Alongside its online learning platform, the Swedish Armed Forces also have a learning portal. This is accessed via the intranet on any Swedish Armed Forces workplace computer. The learning portal contains many digital learning resources for Swedish Armed Forces employees on subjects ranging from materials to management.

Pedagogical support for web-based learning

Alongside good organisational conditions (such as a formulated strategy and allocated resources) and functioning technical solutions (such as a user-friendly learning platform and competent support), there is a third indispensable factor for the success of web-based learning: pedagogical awareness. Online learning activities must be designed in a manner that stimulates the participant's interest and motivates their learning. Anyone within the Swedish Armed Forces who wishes to work with web-based learning can obtain support from various sources to develop their pedagogical ideas and transpose them into practice. For the sake of simplicity, let us differentiate between internal and external support.

The organisational unit with overall responsibility for web-based learning is the Swedish Armed Forces Development Unit for Leadership and Pedagogy (FMLOPE), which is based at the Military Academy in Halmstad. FMLOPE is tasked with leading the development of leadership and pedagogy in the Swedish Armed Forces. This includes supporting and encouraging initiatives that help to place employees in more flexible learning situations. There is web-based learning expertise at FMLOPE and the unit monitors both the technical development of the field and new research into the internet as a place of learning. While FMLOPE provides central support in the form of joint guidelines, requirement specifications and strategic objectives, the unit also contributes to local projects at schools, centres and training units that are interested in moving educational activities online. Together with corresponding units in other Nordic armed forces, FMLOPE studies how social networks and virtual reality can be used for learning. The unit also participates in several major international pedagogical development projects. The unit also holds network meetings at which various aspects of web-based learning are discussed. Web-based learning in the Swedish Armed Forces is another FMLOPE initiative, with the aim of generating new ideas about how learning activities can be conducted in a more flexible manner.

In addition to the pedagogical support offered by FMLOPE, it is also possible to consult an external expert on web-based learning. This service

can be called off against a framework agreement entered into on behalf of the Swedish Armed Forces. The Framework Agreement on the Production of Digital Learning Resources is intended to facilitate the development of web-based learning. The term digital learning resources refers to various study resources that can be published in a digital environment such as a learning platform. These may be advanced productions such as instruction videos and 3D animations or simpler resources such as clickable information pages with text and images. Consultants who provide services under this framework agreement can support all or part of the production process, from designing a pedagogical concept, writing a script and producing media to finally compiling the various components into a single learning resource. However, the production of digital learning resources still requires a commitment on the part of the school, centre or training unit. Unless staff can be allocated to work with the consultant and quality-assure the content, there is always a risk that production will stall or the final product will be substandard. How to develop digital learning resources is the subject of further discussion in Chapter 3.

CHAPTER 2
LEARNING TOGETHER ONLINE

The internet offers a range of opportunities for collaboration and learning, whether on the learning platform or elsewhere. One term coined to describe online forums where people study together is learning communities. Unlike purely informational websites, a learning community revolves around the interaction and exchange between members, rather than the simple conveyance of predetermined content. Of course, learning communities are also used to disseminate information, but they are primarily intended to foster communication and the communal development of knowledge.[32]

While the objective of online learning communities is for all members to share their knowledge with one another, this exchange may take place in a number of ways. How it happens is shaped not least by the learning environment. Some learning communities are related to a study programme or course. They are included as a component of the programme or course when students are expected to contribute to blogs, discussion forums and online meetings. Generally speaking, the point of departure for communication is the study material to be analysed or the exercise to be completed. The meeting place is usually a course page on a learning platform where the teacher or instructor can monitor students' activities.[33]

Other learning communities are job-related. These are often to be found in organisations seeking to develop the skills of their employees and offer them the opportunity to deepen their understanding of a specific field of knowledge. A work-related learning community is usually specialised and may consist of a discussion forum or chatroom on the organisation's intranet, where employees in a given staff category can posit ideas, seek solutions to problems and exchange experiences gained on the job.[34]

A third type of learning community is based on a shared interest. These communities are rarely formally organised and members invest as much or as little time as they like. Discussion forums appear to dominate in interest-based learning communities. One example of this is the SoldF Forum, which has been running on the website SoldF.com since 2002. Although the forum has no ties to the Swedish Armed Forces, it is aimed at those with a military interest. Members can post on weapons, material and vehicles and even discuss military recruitment, training and service.

Blogs

One popular form of community that has grown exponentially over recent decades is the blogosphere. The term blog is an abbreviation of weblog. A blog is a website where someone regularly publishes posts about their life or a subject that interests them, usually with the latest post at the top of the page. Each post in a blog deal with a certain subject – an observation or reflection – and even if the appearance of blogs varies considerably, one common function is that visitors can leave comments on the content of the blog. In this way, a dialogue may arise between the blogger and visitors to the blog.

While a great many Swedes follow blogs, far from all of them are bloggers themselves; only 8 percent of the population writes a blog.[35] One explanation for the popularity of blogging might well be that it provides a simple means of making oneself heard, of formulating one's thoughts and expressing one's opinions in a public forum. Interest in video blogging (vlogging) has increased in recent years. A video blog consists of video clips posted by the vlogger, sometimes supplemented by brief texts.

The majority of bloggers blog about their own lives based on everyday issues that engage them and their visitors. The opportunity for personal expression offered by blogging is one of the pedagogic strengths of web-based learning. The content of a blog is of course controlled by the blogger themselves, giving them power over their own knowledge development.

Posts document a learning process that is in turn supported by visitors to the blog – teachers, instructors, students, colleagues – who comment on posts.[36]

A blog may also be more formal in nature and shared by several bloggers. There are currently over 80 blogs in the Swedish Armed Forces blog portal, in which individual employees and various functions write about their work. One example is a blog on leadership and pedagogy kept by FMLOPE.

For the blogger, the focus is on the writing experience, and many of them testify to just how enjoyable and engaging the process is in itself. By posting text, photographs and audio and video clips, the blogger can express themselves, examine other people's reasoning and develop new knowledge. There are many ways to blog and many of them stimulate learning. Annette Lamb and Larry Johnson identify eight distinct types of bloggers,[37] three of which are especially interesting from a pedagogical perspective

- ***The blogger as diarist.*** Most blogs are structured as diaries in which the blogger posts personal reflections. There are many examples of personnel who post about their work in the Swedish Armed Forces, but this type of blog can also be a useful element of course work when students reflect on how they deal with various situations during their studies.

- ***The blogger as enthusiast.*** Blogs are often places to meet people who share the same interest and wish to learn more about a specific subject area. There are a number of blogs dealing with the Swedish Armed Forces' operations or other defence-related issues.

- ***The blogger as specialist.*** A blog can also be used by experts to disseminate knowledge of their specialisation. For example, there are numerous technical blogs online where visitors can follow the development of and learn more about technical solutions. This type of specialist blog is found in many companies and other orga-

nisations, where it is used as a resource for employees wishing to deepen their knowledge and increase their competence within a specific field. The FMLOPE blog on leadership and pedagogy is one example.

One should be aware that, in learning situations, there is downside to blogs in which people are expected to express their inner thoughts. As a general rule, blogs are public and visitors can read not only the blogger's posts but also comments left by other visitors. The tone in the blogosphere can be harsh and there is always a risk that visitors will post unpleasant comments that other visitors will then be able to read. One should therefore give thought to where a blog is published – online or on a password-protected platform – and whether it should be moderated in some way, such as by the blogger approving comments before they are published.

Pedagogical opportunities

- A blog allows the blogger formulate their thoughts and concerns in a public forum.
- As the content is controlled by the blogges themselves, they have power over their knowledge development.

Pedagogical challenges

- The accessible nature of blogs makes the blogger vulnerable. A post may provoke critical comments that anyone can read.

BLOGS

Discussion forums

Discussion forums are one of the most widely used collaboration tools on a learning platform. A discussion forum is basically a website where participants can bring up a topic for discussion or contribute to an ongoing discussion. Discussions are usually displayed as threads, with posts followed by comments on what has been written. Sometimes a forum will have a moderator tasked with deleting posts that may be offensive or are otherwise irrelevant to the discussion; however, one fundamental principle is that the participants themselves should jointly illuminate a subject

and challenge on another's analyses and interpretations. Although discussion forums have much in common with blogs, they also differ in some regards. Forums are by nature more open than blogs in as much as anyone can initiate a new discussion thread. While it is also possible to comment on blog posts, generally speaking only one or possibly a handful of people can decide on a new topic.

Flexibility in terms of time is often presented as the principal benefit of using discussion forums for web-based learning. A forum is primarily used for delayed, or asynchronous, discussion, with the participants themselves choosing when to post, which in turn allows time to consider and reflect before responding to a post. As such, a forum discussion may be broader and deeper than a real-time discussion, such as during a lesson in a classroom.[38]

While forum discussion can be designed in any number of ways, if the ambition is that participants should learn with and from one another, a positive and open climate of discussion is a must. Michael Hammond emphasises a number of factors that stimulate joint knowledge building in a discussion forum.[39] These can be summarised in three points. The conditions for learning together are improved if:

- posts by participants are based on practical and theoretical knowledge and if the arguments proposed in the forum are more reflective than descriptive;
- participants adopt a critical approach to the knowledge produced in the forum while at the same time avoiding provocation and promoting dialogue; and

- the participants write in a personal manner in the forum and if their posts are written in a conversational style.

It is not always easy to achieve rewarding discussions online. Participants sometimes talk at cross purposes and at times the thread appears to be a series of monologues rather than a coherent dialogue. There is also a risk

that the discussion will go completely off track and begin to address irrelevant topics. The fact that participants decide when, and indeed if, they contribute to the discussion also makes it difficult to reach common conclusions.

In such situations, considerable responsibility rests with the moderator – i.e., the person leading the discussion – especially if the forum is used as a course activity and students are intended to complete a task or answer a question. If a structured discussion is the aim, the teacher or instructor may split students into smaller groups and set a time limit on discussing a given problem. It may also be a good idea to ask each group to appoint a representative to summarise the key conclusions once the discussion is over. The teacher or instructor can then concentrate on responding to the group's conclusions and following the discussion as a whole, rather than commenting on each individual post, something that can be an overwhelming task if a course has many students.

One should be aware that many of the pedagogical opportunities afforded by forums come with challenges of their own. An asynchronous online discussion may well give time for careful consideration, but it can also be frustrating for participants when a response is delayed or is not forthcoming. It is likely that more participants will contribute meaningfully to a forum discussion than to a face-to-face discussion. For those who tend to sit in silence during a classroom discussion or a meeting at the unit or workplace, these forums can be a way to make themselves heard. That said, online discussions may present a formidable obstacle to those who are unused to formulating their thoughts in writing.

Pedagogical opportunities

- Participants in a discussion forum have time to consider and reflect before responding to one another´s posts.
- Discussion forums can continue for a longer period of time and therefore illuminate more aspects.

Pedagogical challenges

- Discussion forums may seem slow if a response is not immediately forthcoming.
- There is a risk that participants will talk at cross purposes.

DISCUSSION FORUMS

Virtual meetings

Online meetings allow participants to meet virtually instead of convening physically at the same location. These meetings go by a number of names, including online meetings and video teleconferencing (VTC). Audio-visual technology allows participants to see one another and communicate verbally. Virtual meeting tools are among the most effective collaboration tools when it comes to creating an online learning community. These tools do however require a certain amount of user training if good results are to be achieved from a pedagogical viewpoint.

Virtual meetings offer various communication opportunities and can therefore be utilised in a range of teaching situations: they can be used one-to-one to support individual learning or to remotely guide an employee through a task, or one-to-many when a teacher or instructor wishes to demonstrate a practical exercise to students located elsewhere. A virtual meeting can also communicate many-to-many, making it possible to hold webinars at which students based in different places can give presentations to one another and discuss their work. It is usually possible to record a virtual meeting. This allows attendees to document learning activities and thus who are unable to attend to catch up with the meeting at a later date. While virtual meeting tools fulfil a specific function in situations in which participants are dispersed across different sites, they can also be used for other learning activities, such as filming repairs of small components so that they can be projected in the classroom for a large group of students.

As teachers and instructors, it is vital to consider how we communicate and which individuals and groups may need to communicate with one another.

Sometimes, however, technology limits how virtual meeting functions can be used. Good audio-visual communication generally demands a certain internet speed. Unless your broadband connection has sufficient bandwidth, your virtual meeting is likely to suffer from audio and video lag. This will break up the discussion and thus significantly impair the conditions for learning. Software and services may also limit the number of people who can attend an virtual meeting and how many virtual meetings can be held at one time.

Virtual meeting tools generally have a number of support functions to improve interactivity and facilitate joint knowledge development.[40] During one-to-many meetings, attendees usually have a set of symbols they can use while someone else is speaking, so that they can raise their hand, applaud a point they agree with or show a thumbs-down if they disagree. It is also common to find a chat function so that participants can send messages during the virtual meeting. Here, they can directly comment on what is being said in the meeting and the speaker can then either respond to the views raised in the chat or allow the discussion to take its own course.

Most virtual meeting tools have a whiteboard function to simplify communication and collaboration. A whiteboard is simply a common writing/drawing area that can be used in many different ways. For example, the teacher or instructor can display a PowerPoint presentation during an online lecture or solve a calculation with students during a webinar. Whiteboards sometimes facilitate screen sharing and file uploading.

One advantage of a virtual meeting is that course participants can meet face-to-face without the need to travel to a single location. For an employer such as the Swedish Armed Forces, which has staff stationed in many locations around the world, such a solution is both cost-effective for the organisation and flexible for the individual. Virtual meetings can also create a strong sense of community in web-based learning. After all, communication is that much richer when participants can see one another's non-verbal signals; a smile, a raised eyebrow, a shrug or shake of the head bring nuance to the discussion and make it easier to avoid misunderstandings and misinterpretations. There is a powerful virtual meeting tool on the Swedish Armed Forces learning platform that can be used for both meetings and learning activities.

Pedagogical opportunities

- A virtual meeting allows people to meet without being physically in the same place.
- In a virtual meeting, participants can communicate, colloborate and learn together in real time.

Pedagogical challenges

- Technology sometimes limits how virtual meeting functions can be used.

VIRTUAL MEETING

Social media

A learning platform give users the opportunity to learn together in various ways. Users can create blogs, post on discussion forums and attend virtual meetings. Web-based learning is not however limited to activities on the learning platform. The growing interest in social media platforms has raised the issue or whether it might be just as well to implement programmes and courses using services such as Facebook (which allows users to network), YouTube (where users can upload and watch videos), Twitter (where users can microblog) and Instagram (where users can share photos) – not least because so many Swedes already regularly use these services.

Probably the best known social media platform is Facebook, which is approaching two billion daily users globally. Over 60 per cent of the Swedish population has a registered Facebook account. On Facebook, users can create a personal profile, add other users as friends, publish photographs, update their status and send messages. They can also join various Facebook groups based on their interests – for example, a Swedish Armed Forces school, centre or training unit – where they can take part in discussions and surveys.

The enormous impact of social media has forced organisations in both the private and public sector to realise the importance of participating in the online public discourse. The Swedish Armed Forces is no exception. The Swedish Armed Forces Social Media Handbook highlights the authority's positive attitude to the new opportunities social media bring, not least in terms of freedom of expression – a key element of the democracy that the Swedish Armed Forces is pledged to defend – which is clearly supported by open communication. Services such as Facebook and YouTube bring the Swedish Armed Forces closer to the Swedish public.[41]

Many social media are used to create and strengthen relationships between those who use them – for example, between friends on Facebook or between Twitterers and their followers – and it is in precisely this close proximity between users that the pedagogical potential of social media lies. Proximity and engagement are fertile ground for learning and when web-based learning activities are placed outside learning platforms the opportunities to gather and share information and develop knowledge jointly with other people are almost endless.[42]

A number of studies have been published over recent years that discuss whether – and if so, how – Facebook and other networking services can be used for web-based learning activities. Among other things, the opportunities presented by using social media that many participants are already registered on and familiar with are highlighted. In cases where Facebook has been used to host courses, the general consensus is that the service has made it easy for students to feel at home and feel a sense of community.

It also appears that social media contribute a more informal air to learning activities. Participants seem to reflect on their learning in a different way when activities take place in an environment they otherwise use to maintain personal contacts and share personal thoughts.[43]

Still, using social media for pedagogical purposes is not without its challenges. Clearly, there is a risk that the attention of participants will drift from the learning activity in hand towards their private life. In a couple of interview studies, informants note that they were often disturbed while working on their web-based course on Facebook by messages and status updates from friends outside the course. Several informants were also very dubious about using Facebook as a course site because they were reluctant to meet teachers and classmates in a zone that is otherwise so personal.[44]

There are also other challenges inherent in moving outside the learning platform. Working with alternative pedagogical platforms such as Facebook, YouTube, Twitter and Instagram can prove time-consuming. A teacher or instructor wishing to use tools other than those provided on the learning platform must expend time and energy learning new applications, evaluating their pedagogical performance and matching them with appropriate assignments and exercises on their course. Such alternatives are not always free of charge and, when a tool lies outside the authority's control, issues of data security, storage and archiving inevitably arise.

Pedagogical opportunities

- Many people already use social media, which may make web-based learning activities more time efficient.
- On social media, users can also benefit from insight and knowledge contributed by people other than those taking part in the learning activity.

Pedagogical challenges

- Some people may be dubious about participating in learning activities on private social media accounts, especially those who have made a conscious choice not to have a social media presence.

SOCIAL MEDIA

CHAPTER 3
USING AND DEVELOPING DIGITAL LEARNING RESOURCES

During the twenty-first century, there has been rapid development in online technology and services that promote collaboration. This also applies to digital learning resources. While the meaning of the term digital learning resources may not be immediately clear, over the years it has become widely recognised among Swedish educational organisations as a collective term for web-based and other digital study resources. For the purposes of this book, we apply a broad definition of digital learning resources that covers everything from digital documents and image files to computer simulations and games.

Digital learning resources differ from traditional study resources in several ways, the most important of which is that they are multimodal. A digital learning resource can present content as text and images as well as video and audio recordings. A digital learning resource can even be interactive. Users can interact with content – and sometimes even with other users – and influence the process. For example, it is possible to create an exercise in which the user chooses between different alternatives and then receives feedback on their choice.

In this chapter, we initially discuss things that need to be considered when using digital learning resources. For example, adding photographs and videos to a PowerPoint presentation. While there is a great deal of free-of-charge digital material available on the internet, there is also copyrighted material and there may be consequences if you decide to use this. The chapter also contains a section on how the Swedish Armed Forces goes about producing digital learning resources in-house. Finally, we offer a few examples of more advanced digital learning resources currently used by the Swedish Armed Forces, such as apps, simulations and games.

Using digital learning resources

There is an enormous range of digital learning resources available. The internet provides access to everything from articles and books to videos and software that can be used in various ways to acquire knowledge. Some online learning resources can be found using search engines, although it is not always easy to obtain relevant search results. It is often a good idea to search in a database instead. In the Swedish Armed Forces image database, to take one example, there are photographs taken by the Swedish Armed Forces own photographic agency, Combat Camera, and other in-house and external photographers. The image database contains material that may be freely used as long as the source is credited.

Other databases that may be of interest include Military Periscope, the Defense Technical Information Center (DTIC) and Swedish Defence Research Agency (FOI) reports. Military Periscope collects data on armed forces, weapons systems, terrorist organisations and peacekeeping missions. It also contains news and reports on current events. The DITC website was created by the United States Department of Defence; visitors can search in a number of article databases and obtain information about the latest research in the field of defence. One example from Sweden is FOI reports, a database that contains all reports published by the Swedish Defence Research Agency since 2001.

There are many excellent reasons to use digital learning resources to support learning. Digital material is easier and cheaper to update than traditional study resources. New facts can be quickly added and maps easily amended. By combining text, images and audio and video recordings, information can be presented in a varied and dynamic manner. Digital learning resources also provide greater opportunities for interactivity and rapid feedback.

Nonetheless, it is important to take a critical attitude to digital learning resources found on the internet. Given that anyone can publish information online, we must always ask ourselves whether the information is correct and what the purpose of publication may have been. That said, by

applying good source criticism it should be possible to evaluate whether the information is credible, likely and rooted in reality. Four criteria taken from Kristina Alexandersson's guide to source criticism can assist evaluation.[45] These are:

- ***Authenticity.*** Is the digital learning resource what it claims to be? Is it an original or a copy? Is the information it contains true or false?
- ***Time.*** Is the information up-to-date? If the digital learning resource describes a course of events, how long after these events was it produced?
- ***Dependency.*** Does the information contained in the digital learning resource stand alone or is it linked to other information sources? Is the information entirely dependent on other sources? If so, in what way?
- ***Tendency.*** Does the information presented in the digital learning resource contain the values and opinions of the author? Whose interests does the source represent? Is there conflicting information from other sources? How credible is the conflicting information?

The internet is often presented as a democratic place where users share texts, images and audio and video recordings out of the goodness of their hearts. Of course, it is not quite that simple. The fundamental principle is that all digital works are protected by copyright, just like a printed book or newspaper article. This implies that a single copyright holder has the right to decide whether, when and how a digital work may be used. Admittedly, the law does permit a private individual to copy copyrighted material for their own use without the permission of the copyright holder. It is also permitted to cite copyrighted work, as long as the source is referenced.

The Swedish Armed Forces have entered into an agreement with Bonus Copyright Access that provides certain rights to copy, download and share copyrighted material for internal information and training purposes. The agreement covers copyrighted literary works, artworks and photographs published both in Sweden and abroad. Catalogues and tables can also be downloaded and shared. The agreement complies with the 15/15 rule,

meaning that a teacher or instructor is permitted to download and print out a maximum of 15 A4 pages. It is also permitted to photocopy material corresponding to 15 per cent, but no more than 15 pages from one digital publication per student per calendar half-year. It is not permitted to copy and share software, computer games or audio and video files. So, if a teacher or instructor in the Swedish Armed Forces wishes to use a video clip from an online source in a PowerPoint presentation, they must first obtain the permission of the copyright holder.

If you wish to use text, images or audio and video recordings as part of a digital learning resource, it is worth keeping an eye out for the symbol Ⓒ. Creative Commons is a non-profit organisation that helps those who create digital works and who wish to share their work. The copyright holder assigns one of Creative Commons' six different licence types to their work. Each license has a symbol that tells users what they may and may not do with the work.[46]

Kristina Alexandersson, *Källkritik på internet* (2016):
https://www.iis.se/fakta/kallkritik-pa-internet/

Mathias Klang, *Copyright – Copyleft: En guide till upphovsrätt och licenser på nätet* (2010):
https://internetstiftelsen.se/docs/copyright_copyleft.pdf

Creative Commons:
http://www.creativecommons.se/

ABOUT SOURCE CRITICISM AND COPYRIGHT ON THE INTERNET

Developing digital learning resources

These days, it is relatively easy to create your own digital learning resources. There are many applications on the market that allow you to design an e-book, edit videos and record audio files. In fact, only imagination sets the boundaries for how content is digitally packaged and used in learning activities. That said, some general advice for those who wish to develop a digital learning resource is still in order. Keep in mind that you should:

- make your digital learning resource as timeless as possible. Avoid referring to dates, people or other information that will make it difficult to use the resource in other contexts than the one it is originally intended for. It saves the valuable time of teachers and instructors if a resource can be used for several learning activities, but this requires that it has broad appeal;
- make your digital learning resource as accessible as possible. The content of your resource should also be accessible to people with disabilities, meaning that videos may need to be subtitled for deaf people or that a document may need text-to-speech for people with reading difficulties; and
- make your digital learning resource as time efficient as possible. Decide with care in advance what your resource is intended for and provide information in an efficient manner. Learning resources that take too long to navigate cause the user to lose both interest and concentration.

Start small and simple. Large, ambitious projects tend to become complicated, devouring more time and energy than you had originally planned to invest.

That said, from time to time a more comprehensive and elaborate digital learning resource may be required, perhaps one with text and images as well as video and audio recordings. Rather than opening individual Word files or PowerPoint slides, the user can then be given access to content via a cohesive interface.

Although some of the Swedish Armed Forces' larger and more advanced digital learning resource are produced in-house, as a general rule we engage an external supplier through the relevant framework agreement. These suppliers specialise in this kind of project and can provide support throughout the production process. Whenever a learning resource is ordered from an external supplier, we also appoint a project group in the Swedish Armed Forces, with a project manager and Subject Matter Experts (SMEs) who can prepare a relevant factual basis for the work and regularly review the content of the resource being created by the supplier.

It is often advantageous if the project manager and SMEs have some experience of using and developing digital learning resources. Those who have tried filming their lectures or designing a test on the learning platform generally have a greater understanding of the opportunities and challenges involved in developing a digital learning resource and can therefore be more thoughtful clients.

Pilot study

A project to develop an externally produced digital learning resource can be divided in four phases: pilot study, design, production and delivery. These phases are briefly discussed below. A more detailed description can be found in the reading resource Att utveckla digitala lärresurser (Developing digital learning resources] prepared by FMLOPE, which is available via the Swedish Armed Forces learning platform and learning portal.

The initiative to develop a digital learning resource is often taken by someone within the organisation who sees a need at their own school, centre or training unit. If funds are available to start a project, a pilot study will be conducted to thoroughly investigate the educational needs. This pilot study will be conducted jointly by the supplier and project group, so that everyone is on the same page concerning the project's background and objectives. The project group will convene one or more meetings to answer the supplier's questions concerning the composition, educational needs, prior knowledge and attitudes of the target group. They will also discuss the framework for the project, including the budget, timetable and the allocation of defence personnel.

During the pilot study, the supplier will be furnished with documents and analyses containing a great deal of information that can subsequently be used to follow up the project. Armed with this information, the supplier can ensure that the project is heading in the right direction during the design and production phases. An analysis of the information provided by the project group concerning the target group, educational needs and knowledge objectives leads to a proposed solution that the project group can evaluate. This proposal may be presented

in the form of a sketch, prototype or storyboard illustrating the action or course of events in the digital learning resource. If the proposal is deemed to meet the needs, the project can proceed to the next phase.

Design

Based on the results of the pilot study in terms of educational needs and a proposed solution, the supplier's scriptwriter will develop a structure for the content of the digital learning resource. A script will be developed. The text will be reviewed by the project group several times during script development and it is in this phase of the project that the Swedish Armed Forces' project manager and SMEs will have the opportunity to exert influence and make creative proposals regarding the content and design of the learning resource.

Writing for digital learning resources comes with great responsibility. More often than not, the user of the material will be working with it alone, without anyone to ask about the meaning of a given word or what the most important thing to learn is. This naturally places high demands on comprehensibility, clarity and carefully balanced and well-defined information. It is different to write a script for a digital learning resource that fully utilizes the possibilities for multimodal learning and to write a script for a printed book. The flow in a learning resource cannot always be linear and the text can be supplemented by multimedia and interactive exercises to engage the user. The text will also sometimes need to be adapted to be read out loud by a narrator. Consequently, the style is often different. Using bureaucratic language and an overly formal tone makes the reading difficult and may even make the learning resource hard to understand.

Production

Once the script is approved and finalised, the supplier can begin producing the media through which the text and visual sketches will be transformed into a finished digital learning resource. While the type of media that must be produced will of course vary from one project to the next, the most common production elements are photography, videomaking, animation, programming and voiceovers. Generally speaking, the project's budget will limit

the choice of media, as some media are quiet simply more time-consuming and costly to produce than others.

One of the simplest production elements is placing the text and images in an authoring tool, a piece of software used specifically to create digital learning resources containing text, images and video and audio recordings. Images can be used to illustrate or explain. They can also be made interactive, so that text appears when the user clicks on elements in the image. An animation often has the same illustrative and explanatory function as an image, with the added benefit that it can show a course of events or progression. A movement in an image attracts attention and highlights a change. When carefully synchronised with a narration, an animation can be used to good effect to bridge the gap between text and image, thus clarifying the content.

More advanced production elements include programming simulation exercises and recording videos using professional actors. It has become increasingly easy to use video as a digital learning resource over recent years as digital filmmaking equipment has become cheaper and more readily available and software for showing videos online has improved. Video can bring to life and create a quicker image of reality than can be achieved using text alone. The dramaturgical and rhetorical elements make video an excellent medium for those seeking to arouse emotions or influence attitudes.

Delivery

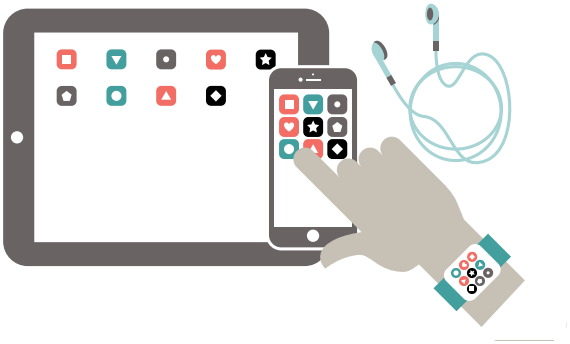
Once the media have been produced and quality-controlled by the project group, the content of the digital learning resource can either be delivered as individual files – for example, video episodes – or assembled in an authoring tool to create a cohesive digital learning resource. Packaging involves structuring the content, often as chapters and pages following the order of the script. The digital learning resource is then delivered to the Swedish Armed Forces for publication on the intranet, learning platform or an open website. Once the learning resource has been tested and the supplier has made any necessary adjustments, the delivery is deemed complete.

When project managing the development of a digital learning resource for the Swedish Armed Forces, it is important to gain support for the project at management level and involve relevant subject specialists and other stakeholders at an early stage. It is also necessary to stay on schedule and review the script and media products in accordance with the agreed timetable. A dedicated and responsible project manager is crucial to the success of the project.

The final section of this chapter is dedicated to some of the more advanced digital learning resources currently used by the Swedish Armed Forces, such as apps, gaming and simulations. These web-based products and tools are not always placed in a pedagogical context, hence the need to look more closely at how they can be used to support learning.

Applications

Interest in mobile learning has increased significantly in recent years. The development of smartphones and tablets has created entirely new conditions for learning. These days, people can use their mobile devices to participate in web-based learning activities wherever they may be: on the train, in the sports hall, at the beach, etc. Mobile learning addresses the fact that people are in constant motion and that what they learn in one place can be developed or applied somewhere else. It also builds a bridge between formal and informal learning situations and provides brand new opportunities for personal and professional development and, in the long-term, lifelong learning.[47]



Anyone arranging a training course needs to be aware of which devices exist to make course content available.

It is becoming increasingly common for companies to develop learning platforms adapted to their products and optimised for mobile devices using an application with the most important functionality of the platform. Applications, or apps as they are universally known, are computer programs written and designed for a specific purpose that users can install on their mobile devices for work or leisure. Apps can contain anything from a simple game or chat function to more complex services such as banking or booking travel. Companies and other organisations are increasingly creating their own apps that anyone with an interest can download, free of charge or for a fee.

The Swedish Armed Forces have developed apps of their own, either to create interest in the agency as an employer or as an internal resource for day-to-day operations. In spring 2016, the Swedish Armed Forces launched an app that attracted significant interest beyond the agency. The Swedish Armed Forces Training Club (FMTK) is now one of the most downloaded exercise apps in Sweden. Users can plan and perform varies forms of physical exercise based on military physical training. The app contains over 450 exercises, none of which require any equipment, as well as a number of training programmes based on different areas of the Swedish Armed Forces' operations. In the app, users can find training partners, exchange tips and compare statistics.

The United States Armed Forces also sees considerable potential in using apps to support learning. In an early report on mobile learning, Jennifer S. Tucker of the U.S. Army Research Institute highlighted three categories of applications of particular interest to the U.S. Armed Forces for training purposes: first, apps as knowledge banks, allowing the user to access digital information about weapons, first aid, Army symbols, terrain information, etc.; second, interactive apps for training exercises; and third, sensory apps including facial recognition, fingerprint authentication, motion sensors, physiological indicators such as heart rate, etc. similar to tools already used operationally. The U.S. military's interest in mobile learning appears to have increased over recent years. Today, the United States Armed Forces have a software library of over 50 apps, many of them intended to stimulate learning.

Games and simulations

Another digital learning resource currently attracting a great deal of attention is gaming. Statistics show that, in Sweden, around 90% of men and just over 70% of women between 16 and 25 years of age play video games and, as so many young people are already familiar with gaming, some educators consider it only natural to make use of these skills in teaching. The Swedish Armed Forces are no exception. There are obviously excellent possibilities to develop courses using gaming and computer simulations. StriSimPC, a combat simulation tool in a PC environment, is currently used at a large number of facilities, allowing teachers and instructors to create their own scenarios or use existing ones.

Simon Egenfeldt-Nielsen proposes that video games commonly used in various educational contexts can be divided into three categories: commercial educational video games (edutainment), commercial entertainment titles used for education, and research-based educational video games.[50] While commercial entertainment titles are not produced as a learning resource, this does not necessarily mean that they have no relevance to someone wishing to learn a subject. The Battlefield series is one of the most popular Swedish entertainment titles on a military theme.

As the name implies, edutainment games attempt to integrate education and entertainment. They are intended to support learning, if not necessarily in a teaching situation. These games are intended to be sufficiently entertaining to function in other contexts. One example of an edutainment game is Fleet Command, which is used to teach naval tactics at the U.S. Naval War College.[51]

On the more serious side, we have research-based educational video games. These have intended learning outcomes and are often produced for use in specific educational situations. It is also fairly common for teachers and instructors to play a leading role in these video games. One example of a research-based video game used by the Swedish Armed Forces is Virtual Battlespace. Developed specifically for military training, Virtual Battlespace is used by armed forces in the United States, United Kingdom, Australia and the Netherlands, to name but a few.[52]

In Sweden, among others, non-commissioned officers attending the squad leader school at the Life Regiment Hussars 7th Battalion have trained on Virtual Battlespace. During the exercises, the NCOs sit in a lecture hall at computers connected to a network. This allows them to act together in the virtual gaming environment, communicating with one another, fighting the enemy and moving position by vehicle or on foot. The main focus is on training to give orders, but the NCOs also learn tactics and leadership. The game is supervised by exercise command, who can follow the soldiers progress towards the enemy and communication with one another on their computers. Exercise command can pause the game, rewind and fast-forward between events and even analyse how the game is developing with the entire group on the big screen at the front of classroom.[53]

Virtual Battlespace (on version 3 (VBS3) at the time of writing) is a powerful simulation program with a wide range of applications. For the online course Forward Observer, scenarios have been recorded. The student reacts to these scenarios using simulated tools such as binoculars and measuring instruments to make an assessment and then send a forward observer report. The student then receives feedback on their report and can redirect fire accordingly until the enemy is defeated.

Scenario for targeting practice.

One advantage of gaming and simulation is that advanced exercises can be performed involving a large number of enemy combatants and vehicles over a large area. A real-world exercise of this kind demands extensive planning and incurs substantial costs, meaning that such exercises can only be arranged on rare occasions. Video gaming is both more cost effective and less time consuming. There are also educational benefits. When the exercise takes place in a context where the gamers' actions can be discussed and analysed in groups, they have greater opportunities to benefit from their own and other people's experiences. In an article on gaming at the U.S. Army's Command & General Staff College, Jeff Leser and James Sterett note that games such as Decisive Action and TacOpsCav allow students to make and learn from tactical mistakes without incurring material losses or casualties for the military organisation.[54]

All of this aside, gaming-based learning does have its limitations. It is an entirely different matter for a squad leader to make decisions when they are under psychological pressure, carrying heavy equipment or bogged down by poor weather conditions. There is also the challenge of balancing education and entertainment when using gaming as a digital learning resource. Without clear intended learning outcomes, there is a risk that the focus will be on their gaming skills rather than their knowledge development. Ultimately, of course, the purpose is not gaming but to learn in an engaging and effective manner.[55]

Anders Frank has studied wargaming in the Officer's Programme at the Swedish Defence University. He uses the term gamer mode to describe

a situation in which a student loses focus on what they are supposed to be learning and instead concentrates on beating their opponent in the game itself. This can easily happen when the game fails to meet the student's expectations concerning how realistic combat appears and when the game contains clear reward structures and victory terms. According to Frank, one way to prevent students slipping into gamer mode is for the instructor to actively guide students, putting events in the game into context and explaining their meaning. Otherwise, there is a risk that students will learn the skills required to play the game and little else.[56]

That said, when used correctly, just like research-based video games, entertainment and edutainment can stimulate new knowledge. According to Love Ekenberg and Mats Wiklund, a game offers much that is missing from "commonplace reality".[57] Among other things, they note that:

- reaction speed can be trained, performance enhanced and coordination improved;
- problems can often be split up and solved step by step without the player losing sight of the wider context;
- there is ample opportunity for immediate feedback through vivid illustrations of the positive and negative consequences of the player's actions; and
- the negative consequences stay in the virtual world of the game rather than being inflicted on the player physically.

In other words, there is pedagogical potential in video games, even in some purely designed for entertainment.

Looking ahead, the identifiable trend appears to be providing games, simulators and simulated environments that are accessible and easy to use. Many companies are developing virtual reality and augmented reality products that have the advantages of scalability, independence from special environments and relatively low prices. Artificial intelligence is also being implemented in games and simulations to an increasing extent, allowing them to adapt to user behaviour.

CHAPTER 4
EDUCATION AND TRAINING ONLINE

Some teachers and instructors in the Swedish Armed Forces are sceptical about training officers, soldiers, sailors and recruits online. Concerns have been raised that the quality of training will suffer, that without face-to-face contact between teachers or instructors and students, it will be hard to be certain that students understand what is being said and have the requisite knowledge to complete an assignment. However, there is no scientific evidence that students learn less online than they do in the classroom. A literature study of over 350 studies compiled by Thomas Russel in the late 1990s demonstrated that students who attend a course with little or no classroom teaching learn just as much as other students. There was no significant difference in terms of grades and examination results when comparing study performance.[58] Several subsequent studies reached the same conclusion.[59]

It also appears that students on web-based courses are just as satisfied with their education as those who follow a more traditional path of classroom teaching. An evaluation by Karlstad University in 2012 showed that students on the university's distance courses and programmes were actually slightly more satisfied than those attending classes on campus. Distance students valued the fact that they learned to think critically and analytically and, above all, they were much more satisfied than other students with the vocational knowledge and skills that the education had given them.[60]

In short, it is quite possible to create both high-quality web-based courses and satisfied students; however, this does not mean that all courses and course components should be online. Whether a course should be

web-based – and if so, to what extent – is a question that must be answered on a case-by-case basis. This chapter is primarily intended to support teachers and instructors wishing to pedagogically develop their courses and use the internet as a learning space. It begins with a few thoughts on the role of the online teacher or instructor, after which it provides an example from another, neighbouring organisation that has moved a large part of its training online. The chapter also examines the ADDIE model, which consists of five phases that a teacher or instructor can systematically follow when organising online courses: analysis, design, development, implementation and evaluation.

Adapting the role of teacher and instructor

Online training differs in many ways from training in the classroom or in the field. When a course is web-based, it is difficult for the teacher or instructor to be the sole bearer and conveyor of information. The conditions are different and it often proves necessary to rethink old certainties when adapting an existing course for web-based learning. For example, anyone who has taught online knows that it demands a special commitment on the part of the teacher or instructor when one seldom or never meets students. The teacher or instructor must quite simply think along new lines; imagination and innovation are called for when seeking new ways to help students to learn.

The Swedish Armed Forces traditionally train officers, soldiers, sailors and recruits on site – in schools, on firing ranges, in workshops, and so on – and it may therefore seem alien to many teachers and instructors to arrange online learning situations. Resistance to web-based learning often appears to be rooted in a concern that it will be more difficult to determine whether students are actually learning anything from online activities, that misunderstandings are more likely if the teacher or instructor and students do not meet face to face, and that the teacher or instructor fears losing their credibility as a subject matter expert if she or he is perceived by students as a novice in the field of web-based learning.[61] In such a situation, it is understandable if it feels safer and easier to refrain from creating online learning activities. However, as the research shows, when

performed correctly, online teaching is actually more effective than classroom teaching, because the internet provides specific conditions that an aware teacher or instructor can turn into pedagogical strengths.

So, what should a teacher or lecturer focus on if they wish to create an online course that delivers good results? Gunnar Gillberg highlights three success factors to bear in mind.[62] These are:

- a well-thought-out structure and method;
- clear supervision adapted to the situation; and
- a carefully considered strategy for providing support and motivation.

A well-thought-out structure and pedagogy are common factors behind the success of many online courses. Without a stated method and clear pedagogical line, it can be difficult to make a course work. Although in some cases students may succeed admirably by defining their own assignments and collaborative forms, there are also many examples of situations in which ambiguous intended learning outcomes have had a negative impact in online learning activities. Gillberg affirms that, even if a stricter pedagogical structure may "in some cases seem unnecessarily regimented and may initially stifle creativity, it has been demonstrated that, in the slightly longer term, it benefits the group's creative environment".[63]

The overall structure and pedagogical idea of the course can be communicated in various ways. A course guide, study guide or course description is often necessary to ensure that students know what is expected of them and can plan their online studies. If a well-written course guide is prepared, the teacher or instructor will spend less time answering questions about the course's intended learning outcomes and structure. Students will also feel more secure if they know what is expected of them during the course.[64] We will return to what a course guide should include later in this chapter.

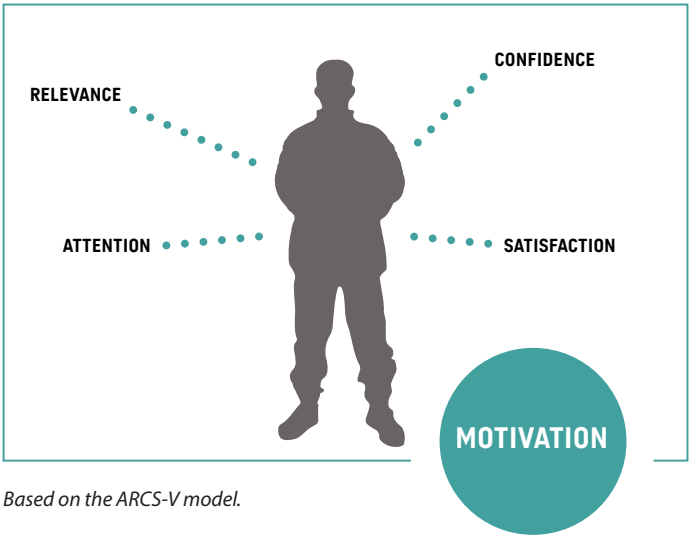
Experience also shows that online courses benefit from an introduction day on which students meet in person and can ask their teacher or instructor questions about intended learning outcomes and assignments. While there are examples of successful courses conducted entirely online, it does appear that students' work benefits from meeting and sitting down together. This provides a common experience and greater engagement that is carried into subsequent online activities. An introduction day can set the tone for the course and provide students with a common launching pad.

A well-though-out course structure and method should be accompanied by responsive supervision on the part of the teacher or instructor. As with any other course or study programme, the role of the teacher or instructor in an online course is increasingly a matter of supervision, of supporting others as they develop new knowledge based on personal experience and needs and the demands placed on them by the world around them. In other words, the point of departure is that the student learns of their own accord, often in interaction with others, and that the teacher or instructor must adapt their support accordingly. There should be no doubt that the role of the teacher or instructor may need to change as the course progresses, from initially instructional to over time becoming more of a resource that students can call on. Once students have acquired deeper knowledge and developed a more autonomous approach, the teacher or instructor will hopefully play a more challenging role that stimulates critical thinking.

As a teacher or instructor, there is good reason to have a carefully considered strategy for providing support and motivation. It is not unusual for students on online courses with few lectures to feel alone and abandoned.[65] This is especially true during a long course with a large element of self-study, when it is easy for students to lose interest and fall behind. It is then crucial that the teacher or instructor has designed activities that really engage students and encourage them to be more expansive and original in their thinking – ideally in collaboration with one another. Greg Kearsly points out that the most important job of the teacher or instructor is to ensure that the course has a high level of interactivity and

participation.[66] So, engaging learning activities on which students collaborate can be a key to the pedagogical success of online courses.[67]

One useful scheme for motivating students is the ARCS-V model developed by John Keller. ARCS-V is an acronym for attention, relevance, confidence, satisfaction and volition. Keller describes these as the five steps to generating and sustaining motivation in the learning process. It is important that a learning activity grabs the student's attention, either by using the element of surprise to capture their interest – perhaps through an unexpected narrative – or by challenging them and tickling their curiosity, perhaps with a complex problem they need to solve. Moreover, students must quickly grasp the relevance of the learning activity. This will be easier if the teacher or instructor links to students' own experiences, highlights the benefits of the lesson and allows them to choose their own approach. When the teacher or instructor then sets unambiguous intended learning outcomes, clearly states how knowledge will be assessed and explains to students during the learning process how they can progress further, self-confidence will be reinforced. The teacher or instructor can also contribute to students' sense of satisfaction in a way that benefits the learning process. Naturally, encouraging words are important, but so too are discussions about how the students can put their newfound knowledge to practical use. Keller then adds a fifth step: the students´ own volition to achieve the intended learning outcomes and take control of their own learning process. This too can be encouraged and reinforced by the teacher or instructor.[68] While the ARCS-V model is applicable to all educational situations, it is perhaps most pertinent to online programmes and courses during which students rarely meet their teacher or instructor, or one another.[69]



Based on the ARCS-V model.

There is sometimes a misconception that online courses and programmes involve the constant supervision of all students individually, and that the teacher or instructor is available at all times. Generally speaking, no one has the resources to structure courses in this way. For example, providing feedback on every post that each student makes on a discussion forum would be enormously time-consuming and it would be nigh on impossible to hold e-meetings on every topic with every student. There are also contractual factors that limit the flexibility of the Swedish Armed Forces' online courses. Teachers and instructors work regular hours, meaning that students cannot expect to receive an immediate reply to questions outside working hours. Equally, students can have jobs that require learning activities to be timetabled far in advance based on other operations. Once again, this is a matter of being clear about what students can expect of their teacher or instructor and vice versa.

Finally, it should be noted that teachers and instructors must give due consideration to certain laws and regulations when creating online learning activities. The Swedish Act on Copyright in Literary and Artistic Works (SFS 1960:729) is one such, and this is discussed in Chapter 3. There are

also statutory requirements for archiving and weeding out documents that must be followed. Other legislation that must be considered when arranging online courses and programmes are the Swedish Freedom of the Press Act (SFS 1949:105), the Fundamental Law on Freedom of Expression (SFS 1991:1469), the Act (SFS 1998:112) concerning Responsibility for Electronic Bulletin Boards, and the General Data Protection Regulation (GDPR). In one way or another, all of these are intended to protect personal privacy and prevent unlawful messages and posts.[70]

Online courses and programmes also make demands of teachers and instructors. This is a form of education that presents enormous pedagogical opportunities – as long as the teacher or instructor is well-prepared. These days, every teacher and instructor must be well-versed in teaching with the aid of web-based solutions. In an organisation based at so many different locations and operating in so many areas, it would be insufficient to train a group of online teachers and instructors to make some parts of courses and programmes more flexible. Every teacher and instructor must be able to plan, design and implement web-based learning activities.

From the classroom to the internet: An example

Over recent decades, many organisations have moved their training from the classroom to the internet and some of these change processes have been documented and described in academic studies that may be of benefit to teachers and instructors in the Swedish Armed Forces. In this section, we discuss one example from a government agency: firefighter training courses run by the Swedish Civil Contingencies Agency (MSB). In a doctoral thesis published in 2015, Robert Holmgren discussed the challenges, contradictions and changes in implementation when an online distance training course for firefighters was introduced in the early 2000s alongside traditional on-campus training. Considering that many of the MSB's areas of operations are not entirely unlike those of the Swedish Armed Forces, there is good reason to examine some of Holmgren's conclusions.[71]

In 2008, the MSB introduced an online firefighter training course with the aim of broadening and diversifying recruitment to the fire service and making training more flexible. Today, the web-based version of the two-year post-secondary accident prevention programme is offered alongside the traditional programme. Almost 80% of the course is held with students working from home. Students communicate with teachers and fellow students online and much of their time is dedicated to self-study. A couple of times each semester, students meet at one of the MSB's schools for practical exercises and to take certain examinations.

Interviews with and observations of instructors in the firefighting programme reveal that the development of web-based learning activities has been fraught with conflict and dilemmas. While in the classroom and on the training ground, many instructors appeared to be very secure; they were well-acquainted with the situation and saw their own task as conveying professional knowledge, checking the students' knowledge and skills and confirming them in their actions. In short, instructors were comfortable in their pedagogical leadership. This changed when learning activities moved online. Now, instructors were passive, hesitant, frustrated at losing control over the teaching situation; they were unsure of the technology, found it difficult to create dialogue with students and to follow their knowledge development as they once had. Once students returned to the school for practical exercises, many instructors returned to the active and secure roll they were used to inhabiting.[72]

Other studies have shown the same thing: teaching on line is often something else entirely from teaching in the classroom or on the training ground and, as a rule, new ways of thinking, teaching and instructing are required if learning activities are to function and help students to achieve intended learning outcomes.[73] If the teacher or instructor considers conveying specific knowledge content to students to be their primary task, rather than allowing students to identify their own knowledge gaps and what they need to do to fill these, then digital tools tend to be used solely to mediate teaching materials; the learning platform becomes nothing more than a file storage site where the teacher or instructor uploads PowerPoint presentations and reading instructions. If, on

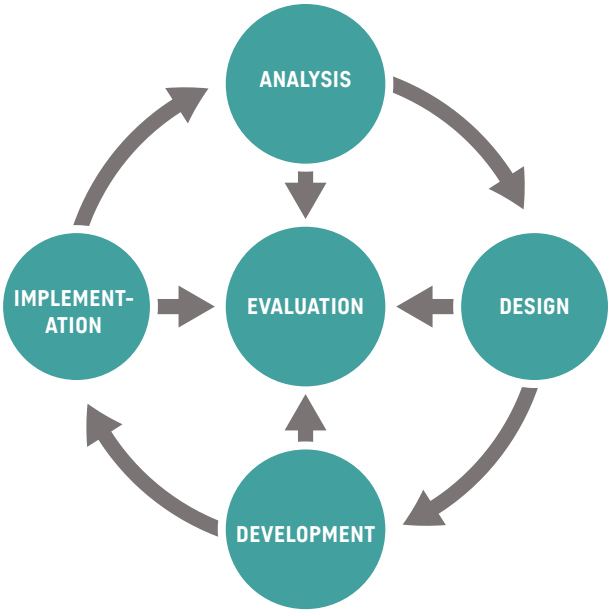
the other hand, the teacher or instructor is interested in what the student already knows and how their knowledge can be broadened, deepened and shaped – if they are interested in "knowledge as a process", to borrow a phrase from the Swedish Armed Forces' basic pedagogical approach – it is more likely that digital tools will be used to the best advantage, to support learning through dialogue and collaboration, for discussion forums, blogs and e-meetings that create a discourse about and encourage reflection on the content of the course.[74]

While for many instructors on the firefighting course, the development of web-based learning activities proved challenging, Holmgren also notes that the instructors gradually came to feel more secure in the role of online instructor and their teaching methods evolved over time. Many went from conveying fixed knowledge content to being more willing to guide their students through the learning process. Similarly, students' learning processes appear to have changed after the training course moved online. Interviews and observations show that, once students got used to the technology and working methods, they took greater responsibility for their own learning and their performance in practical exercises was deemed to be as good as other students. Not only that, but those who attended the distance course were assessed to have a better understanding of the basics when the time came to performing practical fire safety exercises; greater activation of students and more problem-solving in online learning activities had left them better prepared for the various tasks than students studying in the classroom.[75]

While Holmgren's thesis highlights a number or weaknesses and challenges that may arise when a practical course is moved online, his results also show that online learning activities can add value, even if students are studying something as practical as firefighting. If students develop a better understanding before the time comes to tackle exercises on the training ground, exercises can be streamlined and more time can be allocated to subsequent discussions on the complexities of being a firefighter – or a soldier for that matter.

A model for web-based learning

Anyone faced with creating an online course has a great deal to consider and many choices to make. However, there are various models available to use. One that has proven to work well in a military context is ADDIE, a five-step model developed at Florida State University in the 1970s. ADDIE stands for analysis, design, development, implementation and evaluation and, even though the model was initially intended to follow that sequence, today it is widely regarded as a dynamic model in which the various steps interact with one another, not least when applied to creating web-based courses and programmes.[76] The model can be set up as follows:



As shown in the above diagram, the ADDIE model is intended to create a workflow from analysis to implementation, with each step evaluated on an ongoing basis. However, it is not necessary to complete one step before taking the next. It is of course wise to refrain from developing course materials – for example, recording instructions or designing

examinations – until one has analysed the conditions for holding the course and defined intended learning outcomes, but as a teacher or instructor one is used to jumping back and forth between the various steps.

The ADDIE model works for pretty much any course development project, whether the course will eventually be held in a classroom, online or in a blended learning environment. One strength of the model is that it provides a systematic working method. This helps the teacher or instructor to identify organisational, pedagogical and technical challenges and address them at an early stage of the process, thus reducing the risk of encountering problems later. The model quite simply makes it easier to create a well-thought-out course.

Investigating the conditions for holding a course online

As previously noted, the teacher or instructor has a good many things to consider and reflect on when developing a course, but investigating the conditions for holding the course online is clearly a good place to start. This can be achieved by asking five simple didactic questions that will give you a good idea of what the framework of the course looks like:

Hopefully, the answers to these questions will help you to develop the course. They will provide a valuable basis for designing the course and can also alert the teacher or instructor to anything they need to sort out before the course begins.

First, you should ask yourself a couple of important what questions. What is the course about? What does and doesn't fall within the scope of the course? What knowledge is the student intended to develop? Facts, skills or a more abstract understanding of concepts and processes? If the student is intended to develop various (theoretical and practical) types of knowledge and skills, it is important

to consider how these relate to one another and which knowledge is fundamental. All courses should have clearly defined intended learning outcomes that the students are aware of and work towards, and there is reason for the teacher or instructor to begin formulating these at an early stage.

Who?

Once these questions are answered, it is time to consider the target group for the course. Who is the course aimed at? Who will attend the course? How many students will be enrolled on the course? Where will they be during the course? What prior knowledge will students need before they can start the course? When analysing the conditions, one should already be considering students' likely attitudes to course content. Can one assume that the students will find the course content interesting? What motivates them? Does the target group appear to be homogeneous or heterogeneous in terms of prior knowledge or motivation to learn?

Why?

Why questions examine the target group's needs, but they can also help to identify benefits to the organisation in general. Why should students enrol on the course? What will they use their newfound knowledge for? Will the skills and abilities acquired by the students on the course help them to perform certain tasks in the future, either alone or in a group with other employees? Is the course primarily being held to stimulate the student's personal development or is it intended to develop knowledge of use in specific work situations? Is the course intended to solve specific problems or meet specific needs within the organisation?

When?

One crucial question is the schedule for the course: When will the course be held? The schedule for the course does not simply state when the course begins and ends and the timetable for the teacher or instructor and students attending the course, it must also take account of times when other functions within the organisation must be available to provide support. For example, when course administrators need to be available to register students or send out course information. Online courses may also require the services of staff with

training in online pedagogy and technical personnel who can assist in creating and designing a course page on the learning platform and setting up user accounts for students.

How?

Once you have gathered as much information as possible about the conditions for holding a course online, it is time to begin thinking about its design. Now we come to the how question: How should the course be designed? For example, anyone creating an online course should consider whether it is important for the teacher or instructor and students to meet in person. Will the course use a blended learning environment, so that students can attend certain learning activities on campus and others online? What technical solutions do you have at your disposal? Are there interactive elements in the course – lectures, presentations, seminars – that might advantageously be held online using a web camera and headset instead of on campus, making studies more flexible? And how can the internet be used for course elements that require students to perform practical exercises with specific equipment? Simulations can sometimes provide students with the opportunity to practice safely and be prepared for handling equipment in real life later. Due consideration should also be given to whether the course can be designed so that students can interact and collaborate with one another. Social interaction is often viewed as motivational in online courses and collaboration generally has a positive effect on learning, as more people can contribute their unique knowledge and experience.

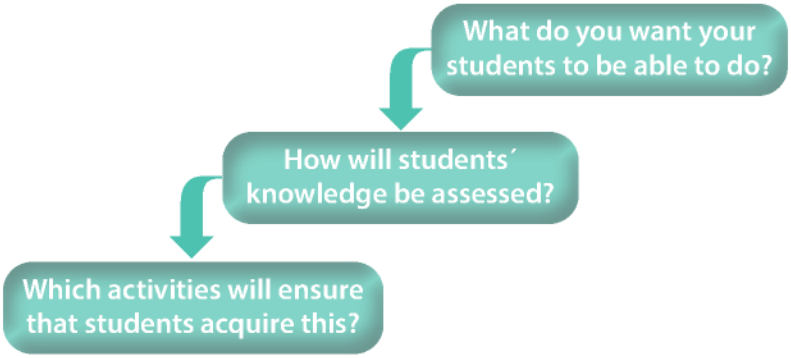
Once these five questions are answered, it becomes easier to create an online course that is relevant and meaningful, and based on the answers you can design a functioning course structure that can then be filled with content.

Structuring an online course

Once the basic conditions for holding an online course have been established, it is time to plan learning activities in more detail. Only when the intended learning outcomes have been defined can you create relevant exercises and formulate relevant assignments. This is also the time to consider how the teacher or instructor can support students. Is there a need for the teacher or instructor to give a lecture or presentation to introduce the subject, highlight important aspects or demonstrate how tasks are to be performed? If so, should these be part of an introduction day or can they be held in a virtual meeting? Perhaps they should be prerecorded and published on the learning platform? And what course literature will be used? Does this need to be adapted to the needs of an online course? The use of digital learning resources is becoming increasingly common in online courses. For example, might video clips of authentic exercises make it easier for students to learn?

It can take time to design an online course. As when planning any course or programme, decisions are not limited to the choice of learning activities, learning support and course literature. The choice of modes of assessment is also important, especially given that this often steers the student's learning.[77] Consequently, you must ask yourself: How will students' efforts be assessed? How should examinations be designed so that the teacher or instructor can decide whether the student has achieved the intended learning outcomes?

One pedagogical principle that should ensure that intended learning outcomes, learning activities and examinations are related is constructive alignment. This principle is based on the idea that students learn better if they are given clearly formulated intended learning outcomes to work towards and if learning activities and examinations are designed to achieve these outcomes and assess the level at which they have been achieved.[78] This may sound obvious, but there are a worrying number of examples of courses that fail to link and integrate these elements. To make sure your intended learning outcomes, learning activities and examinations are aligned, it can be a good idea to work backwards[79] from the result you wish to achieve:



So, the focus is not on a general subject area but on which knowledge the student must have acquired on completing the course. It is the intended outcome of the course that should steer the design of examinations and only when this is decided can learning activities be created that provide students with the opportunity to practice and reflect: to develop knowledge. In other words, constructive alignment makes it easier to design a course in which all of the elements fit together and that is centred around students' learning. This working method is well-established in the Swedish Armed Forces and examples of how intended learning outcomes, learning activities and examinations can be aligned can be found in the publication Handbok Utbildningsmetodik (Handbook of Education Methodology).[80]

In courses with a large element of web-based learning, it is often worth breaking the course down into components or modules to make the content more tangible and increase the student's chances of sustaining motivation and completing the course. It may therefore be a good idea to prepare an overview in which course components are divided into weeks and showing which intended learning outcomes the student is working towards in each component, which learning activities will be included in the component and how the learning outcomes will be examined. In this way, the teacher or instructor can ensure that intended learning outcomes, learning activities and examinations are actually aligned.[81]

Developing the content of an online course

Now it is time to create an online learning environment that you can fill with content. In most cases, this will involve building a course page on the learning platform to host various activities. Of course, you could also use social media such as Facebook, Twitter and YouTube to support web-based learning. However, you should be aware of the security risks inherent in organising learning activities on sites beyond the control of the authority.

Whether you choose to use a learning platform or social media platforms, online learning environments can be exploited in a number of ways: they can act as an information channel and document storage space for a course on which students meet daily at a school, centre or training unit; or they can be a forum for communication and collaboration between students who are studying in far-flung places and who rarely if ever meet face to face. High-quality web-based learning does not depend on using many tools and functions, but rather judiciously applying a select few to support your students' learning. It is applicable to almost any educational situation.[82]

Your learning environment then needs to be filled with content. This might be digital learning resources, images, audio files or videos that your students can access, or it might be collaboration tools such as blogs and discussion forums that they can use to process course content. When developing the content of an online course, it is worth considering that learning is stimulated by a well-balanced mix and variation. A few introductory texts and instruction videos, a discussion forum and a few virtual meetings to address interesting problems may be enough to create learning activities that help your students develop new knowledge.

Information about which learning activities are included in the online course, how students' knowledge is to be assessed, which course literature will be used and what learning support students can expect should be provided before the course begins. Writing a course guide (sometimes called a study guide or course description) will help teachers, instructors and

students to orient themselves. This can be published on the learning platform, either directly on the course page or in a separate document that can be opened and downloaded. The more comprehensive the information in the course guide, the easier it will be for the teacher or instructor to structure their work and for students to plan their studies. While a course guide may be designed in various ways, it should always include:

- ***An introduction to web-based learning.*** What does web-based learning mean? What demands does it place on students? What role does the teacher or instructor play? Given that one can assume that some students will never have attended an online course before, it is a good idea to offer some sound advice about how to quickly get started with their studies and stay motivated.
- ***Information about the course's content, structure and intended learning outcomes.*** What is the subject of the course? What knowledge or skills is the student expected to have acquired on completing the course? What is the timetable? If the course utilises blended learning – i.e., if some components are held online and others on campus – you should describe how these elements relate to one another.
- ***Information on learning activities.*** What exercises will students have the opportunity to take part in during the course? What individual and group assignments will be set? When and how will the various learning activities be implemented? Are they compulsory or elective? A weekly timetable will generally provide a good overview of the course and make students feel secure.
- ***Information on examinations.*** What modes of assessment will be used? What assessment criteria will the teacher or instructor use to decide whether students has achieved the intended learning outcomes? What is the procedure when a student fails an examination? Few elements of a course arouse as much interest, or cause as must anxiety, as examinations and information concerning how a student's knowledge will be assessed by the teacher or instructor should therefore be clear and precise.

- ***Information on course literature.*** Which manuals, doctrines, regulations, etc. will be used in the course? Is there anything in the course literature that students should pay particular attention to? Where can course literature be obtained? Must students source the literature themselves or will it be supplied by the teacher or instructor?

The course guide should also contain practical information such as the names of the teachers or instructors teaching the course, the name of the course coordinator and how students can contact these individuals. The importance of clarity in the course guide cannot be overemphasised; precise instructions and unambiguous formulations can save a great deal of time that will otherwise be expended answering students' questions.

Conducting teaching activities and examinations in online courses

After careful planning, your online course can finally begin. This is when the pedagogical work begins in earnest, as the teacher or instructor supports the student's knowledge development and pilots them through the course. Courses usually consist of a number of different components that are combined to form a richly varied whole. Below, we discuss three learning activities that often appear in various forms in online courses: lectures, supervision and group work. The section concludes with a discussion of examinations, which when correctly designed can also be viewed as learning activities.

Online lectures

When they think of a lecture, many people see a teaching activity in which the teacher or instructor talks and the students sit quietly and listen. The design may of course vary. Some lectures explain theories in order to provide a more in-depth and complex picture of a subject. Others provide students with practical instruction or demonstrations of, for example, how a given material works. Whatever form it takes, it is the teacher or instructor who narrates, explains and structures the content.

For an online course, it may be appropriate to prerecord your lectures and publish them on the learning platform or some other platform such as Podomatic or YouTube. Podcasts are becomingly increasingly popular elements of online courses, with pre-recorded lectures uploaded as audio files that students can subscribe to. One advantage of podcasting lectures is flexibility; students can listen to them whenever it suits them and return to any part of the lecture they want to hear again. Nor is it especially difficult to record and publish a lecture. Among other applications, podcasts have proved practical for teaching languages online, with teachers or instructors recording words and phrases that students can then use as a basis for their own pronunciation exercises.[83]

Video podcasts, or vodcasts, are an even more common part of online courses. These can be used to broadcast lectures held for students on another course that have been recorded in the lecture hall using a video camera. Vodcasts can also be used for narrated PowerPoint presentation created by the teacher or instructor on their computer or tablet, which can then be made available on the learning platform. And, of course, compared to audio recordings video recordings offer teachers and instructors entirely new opportunities in terms of illustrating their reasoning, and many applications also offer a certain level of interactivity. For example, the teacher or instructor can add self-corrected answers to video recordings that students can answer while watching the lecture.[84]

Pre-recorded video lectures are sometimes used to free-up time for other, more knowledge intensive learning activities in which teachers or instructors meet students in person. In a flipped classroom, students arrive already prepared by, for example, watching a video lecture and discussing the content with one another in an online discussion forum. They may also have taken an online quiz that gives the teacher or instructor an idea of which parts of the lecture the students have understood and which need further instruction or more detailed discussion in the classroom. Meetings between the teacher or instructor and students in the classroom can also be used for practical exercises based on the theoretical knowledge the students have been able to acquire individually or with fellow students

online. This creates better conditions for active learning by doing, as well as reflection on what they have done and how they did it.[85]

It is not always optimal to allow students to listen or watch recorded learning activities without being able to ask questions or seek clarification. However, should the teacher or instructor wish to have a more dialogic structure, it is always possible to hold a virtual meeting in which they can communicate with students using images, audio and text. Students can ask questions and offer ideas either over the video link or using the chat function and the teacher or instructor may in their turn add variation to the lecture with PowerPoint presentations and video clips. Many online-meeting tools also have a record function so students who are unable to attend can catch up with what has been said and shown later. This also means that the lecture can be saved for future use when the course is given again, or in a different course on the same subject.

Online tutoring

In web-based learning, tutoring is a matter of guiding the student through the learning process. The point of departure is what the student feels they need to improve and what the tutor can do to help them progress in their learning. By allowing the student to formulate their current level of knowledge and their perceived knowledge needs in their own words, the teacher or instructor can adapt their support and their tutoring so that they can motivate, engage and explain in the manner best suited to the individual and the group.[86]

Online tutoring can be provided to the individual or the group, orally or in writing. One should be aware that online tutoring can demand a certain amount of preparation. As with all web-based learning, it is important to give clear instructions about how activities are to be conducted. It will also do no harm to formulate a bullet list of what the teacher/instructor and student can expect of one another during the tutoring process. When tutoring is provided in an online meeting during which the teacher/instructor and student have audio-visual communication, the situation need not differ to any great extent from any other tutoring situation. For example,

if the student's assignment is to prepare an action plan to provide crisis support to their platoon during a mission, they can upload the document and go through it with the teacher or instructor. If it is possible to record the online meeting, students can replay the recording later to hear the teacher's or instructor's comments again.

It is also no problem whatsoever to tutor without an audio-visual connection. The students in the above example could simply upload their documents to a discussion forum where the teacher or instructor can comment on their crisis support action plan. This provides a different level of flexibility in the tutoring situation. When it is difficult to find time for the teacher/instructor and students to meet face-to-face online, the written environment of the learning platform works splendidly. Tutoring in discussion forums also invites reflection; there is time for students to ponder the teacher's or instructor's comments and offer considered responses, thus deepening their understanding.[87]

The Swedish Armed Forces have developed a digital resource called Professional Development Through Tutoring (YGHL). This is both a learning resource that describes various aspects of tutoring and a tool in which supervisors and students can document tutoring and share their experiences with others.

Group work online

Not all web-based learning activities need to be led by a teacher or instructor. A learning platform provides good opportunities for students to build knowledge together and document their learning. Group work may sometimes seem like a tired concept but, the fact is, the learning process often gets a creative boost when the members of a group put their heads together to complete an assignment or solve a problem. In such situations, the whole can be greater than the sum of its parts.

When organising online group work or group exercises, it is important to have a framework and formulate intended learning outcomes. In other words, as a teacher or instructor you should describe both what the

working process should look like and your expectations of the group's performance. It may also be a good idea to encourage group members to agree among themselves on how they will collaborate. Not knowing what rules apply can easily lead to insecurity and misunderstandings. Online conflicts are more likely to arise because people fail to communicate clearly than because they have different opinions about something.[88]

Online group work can be organised in various ways. You can create a project space on a learning platform where groups can discuss the assignment or problem and upload documents, images and videos that they can use in their joint project. Blogs can also be used for group work. If possible, however, group work should begin with an introduction or study day, so students can meet in person. The planning phase of online group work tends to be drawn out unless the group members have the opportunity to speak to one another directly. Online meetings are another excellent opportunity for group work.

Kathryn Linder talks about four different forms of group work, all of which can be implemented online. Certain group projects encourage collaborative learning, with students working together to develop new knowledge. This might involve a group of students jointly examining a subject in depth and then presenting it to other students. Another type of group work is characterised by cooperative learning. Here, students help one another to solve a problem or understand a cognitive operation. In team-based learning, the aim is for the group to define an assignment and find a working method that makes use of the group members' various competences. Finally, group work characterised by problem-based learning begins with a problem that the students as a group need to find a solution to by searching for information, determining which information is relevant and applying it to the problem at hand.[89]

Online examination

The purpose of an examination is to assess whether the student's factual and tacit knowledge, comprehension and competence are at a sufficient level in relation to the course's intended learning outcomes. It is against these that the student's efforts must be measured.[90]

Online examinations can be implemented in many different ways and it is important to choose modes of assessment with care. This is because research shows that examinations very much steer learning. Oral and written examinations signal which knowledge and skills are deemed important and many studies have confirmed that students spend a great deal of time attempting to predict the content of examinations and adapt their studies accordingly.[91] It is therefore important to examine a course in a manner that contributes to developing the knowledge and skills stated in the intended learning outcomes. In other words, an examination should not only check that the student has learned something, but also in and of itself promote the development of the student's knowledge.

A line is often drawn between summative and formative assessment.[92] Summative assessment is the assessment of learning. This might be viewed as the traditional way of measuring knowledge. Here, the question is: what has the student learned by the end of the course? Any assessment of this type can easily become high stakes for the student, given the potential consequences of failing to demonstrate the required knowledge at the end of the course. Formative assessment is assessment for learning and as a rule it takes place on an ongoing basis throughout the course: examinations are intended to support and develop the student's learning. So, in this type of assessment, the student is playing for much lower stakes. The consequences of failure are not as immediate and the results of an examination or exercise can be used as a starting point for continued pedagogical work.[93]

These days, research is very much focused on how examinations can support learning, hence the increasing use of formative examinations in online courses.[94] In a study of 50 online university courses, Agneta Hult confirms that teachers often assess formatively. Many of the courses are divided into components with multiple written assignments that the teacher can comment on. Both teachers and students see benefits in continuous individualised feedback on what the student has done well and what can be improved by the time the next assignment is due.[95]

Using the learning platform, the teacher or instructor can design examinations that both assess and develop knowledge. The learning platform has a test tool that can create both simple and more complicated tests of knowledge. The teacher or instructor can choose different types of questions (multiple choice, matching questions, essay questions, etc.) and even make the test self-correcting if so desired. This makes it easy to construct a diagnostic test that students can take at the start of the course or weekly tests that students can take themselves to drill their knowledge of course content.

Students can also upload assignments to the learning platform for marking and comment by the teacher or instructor. The submission tool relieves the teacher or instructor of the need to collect students' individual examinations in their email box. All communication concerning assignments can be handled in the submission tool There is a message field where students can describe their work and a comment field where the teacher or instructor can enter written assessments. Written assignments can also be anonymised, so that the teacher or instructor cannot see who has uploaded an assignment until it has been marked. There is also a plagiarism checker, allowing the teacher or instructor to swiftly determine whether the student's assignment contains citations from books, papers and articles published online, or from other students' work that is saved in the plagiarism checker.

Online examinations have their own challenges. It is not always easy to be certain that the person who submits an assignment is actually the author. One way to mitigate the risk of cheating is to link the examination and the knowledge it assesses to different learning activities during the course. The more integrated the examination is in the course, the easier it is for the teacher or instructor to detect signs that the content was produced by someone other than a student, or if it has been plagiarised from a book, article or information page on the internet.

New forms of formative assessment have recently been under the spotlight, including peer review. By allowing students to read and comment on one another's assignments in a discussion forum, their understanding can

be increased and their work improved. Peer review helps students to both grasp that there is usually more than one way to approach an assignment and achieve an outcome and to reflect more deeply on the content of their own submission.[96] For example, if students are asked to perform a risk assessment of a given mission situation, peer review can make them aware that risk can be assessed in different ways, as well as giving them a fresh perspective on their own work. In this way, students help one another to perform high-quality risk assessments.

Good feedback is key to formative assessment. In fact, there are few learning activities that have such an impact on the student's learning, especially in online courses when opportunities for teachers/instructors and students to meet in person are limited.[97] For these students, receiving regular feedback on their efforts can be crucial to sustaining motivation and finding the energy to complete their studies. In this situation, a wise teacher or instructor will seize the opportunity to use other students as a resource. When students offer constructive feedback on their fellow students' assignments, proposed solutions or practical exercises in a blog or discussion forum, they not only develop a deeper understanding of course content, but they also create esprit de corps and a sense of community that provides security in learning situations.[98]

Evaluating online courses and results

Like any other course or programme, an online course must be evaluated. Without evaluation, there is clearly a risk that the development of the Swedish Armed Forces' training and education system will grind to a halt and that we will be unable to ensure the quality of our programmes and courses. A course evaluation looks both forwards and backwards to identify any necessary organisational changes and to ensure quality, and to check that intended learning outcomes have been achieved.

Evaluation is a key element of the ADDIE model; evaluation should be an ongoing process from analysing the conditions for the course, through course design and content development and the implementation of learning activities and examinations. In this way, quality is continuously assured.

An analysis of a course can be split into two parts: an evaluation and a valuation. An evaluation is a balanced assessment of relevant factors and the outcome of the course or other learning activity. Evaluating a course also involves a broad investigation in which the teachers or instructors involved in a course describe their experiences, students have the opportunity to offer their opinions and examination results are assessed. One often has the impression that the evaluation of a course begins and ends with the students' course assessments. However, the most important element of an evaluation is whether the intended learning outcomes have actually been achieved, rather than the students' own assessment of whether they have achieved the aims of the course.[99]

At the same time, it goes without saying that the opinions of students must be collected and given due consideration. A course valuation must always be performed within the framework of a course evaluation. This refers to a survey of the students' assessment of the course or other learning activity. This generally involves a written assessment at the end of the course, although there is absolutely no reason why a teacher or instructor should not maintain an ongoing dialogue with students concerning intended learning outcomes, learning activities and modes of assessment as the course progresses. Providing students with the opportunity to exert influence can increase engagement in both the course and their own learning.[100]

Valuations of online courses can look very different. If it is not possible to gather students on campus, for example, the learning platform's discussion forum and survey tool can be used. The discussion forum is particularly useful when the teacher/instructor and students wish to maintain an open dialogue concerning the course and how it can be developed and improved. The survey tool makes it possible to create a more structured course valuation and also allows students to express their opinions anonymously. Among the benefits of using the learning platform's survey tool is that you can select from different types of questions, reuse questions from other course valuations and easily compile results. Of course, this applies equally to all courses, not just web-based learning activities. It is also possible to follow up students responses at a later date. How do they view the course one or two years after completing it? What knowledge

have they put into practice and what would they have liked to learn more about? By using the learning platform survey tool, the teacher or instructor can simply and systematically obtain information about the course to meet the organisation's needs.

All of the above aside, there are also challenges associated with placing course valuations online. One being getting students to take part. As it is no longer possible to ask students to complete a survey at the end of a concluding learning activity in the classroom, there is always a risk that they will forget to complete it. That said, it is possible to activate an automated reminder on the learning platform without revealing the identities of students who have yet to respond.

Whether intentionally or unintentionally. many course valuations focus on teaching. As a result, assessments tend to concentrate on the quality of teaching, instruction and teaching materials rather than the learning process.[101] Take the following question as an example:

- ***What did you think of the teacher's contribution to lectures?***
  - ☐ Very good
  - ☐ Fairly good
  - ☐ Not very good
  - ☐ Poor

If the focus were to be shifted to learning, the survey might make the student think about why and how they learned something. The course valuation thus forces the student to reflect on their learning process. Instead of being expected to simply assess the teacher's efforts, now they must also examine their own. Taking a learning-based approach, the question might instead be formulated as follows:

- ***To what extent have lectures helped you to learn?***
  - ☐ To a great extent
  - ☐ To a relatively large extent

- ☐ To a relatively small extent
- ☐ To a very small extent

Conducting a course valuation is one thing, using the results to develop better courses something else entirely. Many teachers and instructors, and indeed some students, seem to find it frustrating that course valuations are seldom much more than customer surveys. At best, the results are communicated to students, but they are not used to develop the course.[102] If course valuations are to have any meaning, the school, centre or training unit cannot be satisfied with reporting a summary of student opinions; they also need to describe the measures they intend to take to increase the quality of future courses. The results of a well-thought-out course valuation often stimulate new pedagogical ideas, in which case it should come naturally to use students as a sounding board for the continued development of the course.

Web-based learning provides excellent opportunities for anyone seeking to add flexibility to their teaching, and the step to creating web-based learning activities need not be as long as it might first appear. There is no great skill involved in recording and publishing a lecture on the learning platform nor in opening a discussion forum and getting a discussion underway. Begin on a small scale and with simple measures. Web-based learning in the Swedish Armed Forces has demonstrated that there are many pedagogical benefits to web-based learning activities. They offer new ways of meeting and learning together and are especially valuable to an authority such as the Swedish Armed Forces, an organisation with employees scattered across multiple locations and with a need for a highly flexible education and training system.

CONCLUSION
GUIDE TO IN-DEPTH READING

Web-based technologies are developing rapidly and over the years the scientific literature on web-based learning activities has become increasingly comprehensive. This concluding reading guide offers tips on books that discuss various aspects of web-based learning in a readily accessible manner. Some of the books were published recently. Others have been around for a few years now. What they all have in common is that they provide the reader with a good opportunity to deepen their knowledge about how best to organise learning activities on the internet. The literature tips follow the four chapter headings of the book: "Learning online", "Learning together online", "Using and developing digital learning resources" and "Education and training online".

Learning online

One book in Swedish that provides a good introduction to web-based learning is Stefan Hrastinski's Nätbaserad utbildning: En introduktion (Web-based Courses: An Introduction] (Lund 2013; second edition). Hrastinski guides the reader through research showing how web-based technologies can broaden learning horizons and offers a great many tips and questions that will help the reader to reflect on different ways to create learning activities on the internet. The book also contains a score of brief interviews with researchers and other experts who share their thoughts concerning the opportunities and challenges of web-based learning.

In Learning Online: What Research Tells Us about Whether, When and How (New York 2014), Barbara Means, Marianne Bakia and Robert Murphy look at online learning in more detail and ask whether, when and how different web-based technologies should be used in various learning situations. The book not only highlights the role of the internet in

organised education but also how web-based activities can stimulate lifelong learning at work or outside.

A third book that deals with web-based learning at a more general level is Randy Garrison's E-Learning in the 21st Century: A Community of Inquiry Framework for Research and Practice (New York 2017; third edition). Among other things, Garrison discusses how the internet has changed how we learn and opened the door to new pedagogical models and approaches. Garrison's reasoning on how to create good web-based learning activities through social, cognitive and teaching presence are particularly interesting.

Learning together online

A number of authors have demonstrated how dialogue and collaboration facilitate learning. Many good ideas about how teachers and instructors can create the conditions for people to learn together online can be found in a trilogy of books on learning communities that, despite the fact that a number of years have passed since they were published, still remain useful. The first book, Lärgemenskaper på nätet – en introduktion (Online Learning Communities: An Introduction] (Lund 2004) edited by Ove Jobring, introduces the term learning community and offers examples of how learning communities work. The second book, Att förstå lärgemenskaper och mötesplatser på nätet (Understanding Online Learning Communities and Forums] (Lund 2005) edited by Ove Jobring and Urban Carlén, problematises and looks at the term in more detail, while the third book, Att skapa lärgemenskaper och mötesplatser på nätet (Creating Online Learning Communities and Forums] (Lund 2006) edited by Ove Jobring, Urban Carlén and Josefin Bergenholtz, offers the reader more solid advice on what to consider when designing collaborative online learning activities.

Nor is there any shortage of books dealing with the opportunities and challenges presented by online collaboration tools, with example of how these can be used in specific learning activities. One such is Web 2.0: How-to for Educators (Eugene 2014), by Gwen Solomon and Lynne

Schrum, which deals with everything from blogs to online meeting tools, as well as listing 200 applications and services that have proven to provide good support for web-based learning. Anyone interested in collaboration tools beyond the learning platform and how social media can be used as a learning space will benefit from reading Tanya Joosten's Social Media for Educators: Strategies and Best Practices (San Francisco 2012). Joosten uses several examples from Facebook, YouTube and Twitter to illustrate how different social media platforms are suited to different learning activities. For those interested in learning more about the pedagogical aspects of Facebook, YouTube, Twitter and other social media there is the anthology Educating Educators with Social Media (Bingley 2011), edited by Charles Wankel, which explores the experiences of teachers and instructors who have tried their hand at creating web-based learning activities outside dedicated learning platforms.

Using and developing digital learning resources

Web-based learning activities are subject to a range of statutory requirements that teachers and instructors should be aware of, not least copyright as it applies to different types of digital learning resources. The legal aspects of web-based learning are examined in Juridiken kring e-lärande (The Laws Around e-Learning] (Lund 2012) by Cecilia Magnusson Sjöberg and Sanna Wolk. This book answers many questions: What material may be uploaded to learning platforms? What are the legal requirements when linking to online digital learning resources? Can a teacher or instructor play a video clip from the internet for their students? What data produced in an online course must be saved and what can be erased? With references to relevant text of law, the book's authors clarify the legal framework for web-based learning.

There are many books on the market for those keen to learn more about using digital learning resources such as apps, simulations and games in various learning situations. Mobile Learning: A Handbook for Developers, Educators and Learners (Hoboken 2015) by Scott McQuiggan, Lucy Kosturko, Jamie McQuiggan and Jennifer Sabourin includes several chapters on how to develop and utilise apps in various learning activities. Kurt

Squire's Video Games and Learning: Teaching and Participatory Culture in the Digital Age (New York 2011) provides a good introduction to game-based learning, while there are many exciting articles on games as learning resources for military training in the anthology Joystick Soldiers: The Politics of Play in Military Video Games (New York 2010), edited by Nina Huntemann and Matthew Thomas Payne.

Education and training online

Stefan Hrastinski, author of Nätbaserad utbildning: En introduktion (Web-based Education: An Introduction) (Lund 2013), has also edited an anthology in which readers can learn more about organising online courses. In Mer om nätbaserad utbildning: Fördjupningar och exempel (More About Web-based Education: Specialisation and Examples) (Lund 2011), a group of researchers and teachers share their results and experiences of web-based learning. Among other subjects, the book's chapters deal with success factors for online courses, how to supervise online and how peer review works as a web-based learning activity. Another useful book in Swedish is Patricia Diaz´ Webben i undervisningen: Digitala verktyg och sociala medier för lärande (The Web in Teaching: Digital Tools and Social Media for Learning) (Lund 2012). Although this book deals with the role of the internet in schools, it also contains a review of various collaboration tools and social media with suggested areas of application.

There are a number of manuals in English that offer sound advice and good ideas concerning what teachers and instructors should bear in mind when planning, implementing and evaluating online courses. Among the most practical is Essentials of Online Teaching: A Standards-Based Guide (New York 2017) by Margaret Foley McCabe and Patricia González-Flores, which guides the reader through the process from pedagogic concept to completed course, with specific examples. In the same series, we also find Essentials for Blended Learning: A Standards-Based Guide (New York 2014) by Jared Stein and Charles Graham, which deals with teaching in blended learning environments.

Books have also been written about the flipped classroom. Among the anthologies are Flipping the College Classroom: Practical Advice from Faculty (Madison 2016), edited by Barbi Honeycutt, and The Flipped Classroom: Practice and Practices in Higher Education (Singapore 2017), edited by Carl Reidsema, Lydia Kavanagh, Roger Hadgraft and Neville Smith. Both of these contain articles that may be useful to anyone interested in refreshing their teaching by using web-based technologies to introduce innovative learning activities into the classroom. Here, another book worth mentioning is Daniel Barker's Input Flipped Classroom (Stockholm 2013), which while taking schools as its starting point, is nonetheless a good Swedish-language introduction to the concept in general.

It is also pertinent to mention a book dealing specifically with online examination. In addition to providing examples of various ways of assessing students' knowledge in online courses, Assessing Learners Online (Upper Saddle River 2008) by Albert Oosterhof, Rita-Marie Conrad and Donald Ely also offers advice on how teachers and instructors should go about identifying the modes of assessment that best test whether students have achieved the intended learning outcomes of their education.

Finally, there is every reason to highlight two annual reports that analyse and forecast the development of the internet and web-based learning. Published by the Swedish Internet Foundation, The Swedes and the Internet describes how internet use in Sweden develops and changes. The Horizon Report: Higher Education Edition, published by EDUCAUSE, forecasts trends in technology that are likely to have an impact in higher education institutions over the coming years and the potential challenges they present to these organisations.

NOTES

1) Hans Palm, introduction to John A. Bååth & Bertil Malmport, Visst kan du: *Om drivkrafter och genvägar vid lärande* (Yes You Can! On Motivation and Shortcuts to Learning) (Stockholm 1991).

2) Bengt-Ivar Kroon, "Distance Education for the Twenty First Century: Report from the ICDE World Conference", *Insikt och utbildning: Ett informationsblad från Försvarets förvaltningsskola (Insight and Education: An information sheet from the Swedish Staff College National School of Administration*) (1993), a themed issue on distance education.

3) *Kompetensutveckling för distansutbildning* (Developing competence for distance education) (DU) (27.11.1998, memorandum from HKV GRO UTB till Projekt skolutbildning); *Utredningsuppdrag datorbaserad kommunikation vid distansutbildning* (Inquiry into computer-based communication for distance education) (09.09.1999, LedC 191000:60377); *Försvarsmaktens utveckling av distansutbildning* (The development of distance education in the Swedish Armed Forces) (03.08.1999, HKV 19100:68459), Appendix 1.

4) J. D. Fletcher, Sigmund Tobias & Robert A. Wisher, "Learning Anytime, Anywhere: Advanced Distributed Learning and the Changing Face of Education", *Educational Research* 36 (2007).

5) Björn Öberg, *Strukturer inom Försvarsmaktens utbildningsverksamhet: En kvalitativ fallstudie om individuellt och kollektivt lärande* (Halmstad 2017).

6) Jared Stein & Charles Graham, *Essentials for Blended Learning: A Standards-Based Guide* (New York 2014); Jonathan H. Westover & Jacque P. Westover (eds.), *Engaging Hybrid and Blended Learning in Higher Education* (Champaign 2014).

7) Daniel Barker, *Flipped Classroom: Det omvända arbetssättet (The Flipped Classroom: Working in Reverse*) (Stockholm 2013); Barbi Honeycutt (ed.), Flipping the College Classroom: Practical Advice from Faculty (Madison 2016); Carl Reidsema et al. (eds.), *The Flipped Classroom: Practice and Practices in Higher Education* (Singapore 2017).

8) Mikael Lindholm et al., "Försvarsmaktens pedagogiska grundsyn" (The Swedish Armed Forces' basic pedagogical approach), in Mikael Lindholm (ed.), *Pedagogiska grunder* (Pedagogical Basics) (Stockholm 2006).

9) Ference Marton et al., *Inlärning och omvärldsuppfattning: En bok om den studerande människan* (Learning and Perception: A book about the studying person) (Stockholm 1999).

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