# Motivation and Online Learning

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## ABSTRACT

This paper is based on a post-graduate thesis which received an A at the Institute for Adult Education (VOX) spring 2004 and looks at which measures can be facilitated such that the teaching principle of motivation is optimized during development of online learning for the Norwegian Defence(NoD). These measures are collected in a checklist to ensure pedagogical quality and focus on student motivation. This list has become a standard piece of the information available to NoD courseware developers and is included in NoD`s methodology for developing elearning. By looking at the Didactical Relational Theory (DRT), well-known principles of learning and variables affecting success with online learning, the checklist helps to ensure that student motivation is optimised in all NoD online courses.

The checklist contains the following important aspects tied to achieving student motivation: Objectives and goals, involvement, feedback, emotions, socialisation and self-efficacy. During the last couple of years the checklist has been successfully used during the development of a number of online courses. These courses include both hardskills courses such as application- and computer systems training and soft-skills courses such as education in laws of armed conflict.

## ABOUT THE AUTHORS

**LtCdr Geir Isaksen** is a former submariner working at the Norwegian Defence Academy in Oslo. His current position is ADL advisor at NoD ADL Centre were his been working for 3 years. In 1998 he finished a degree as a College Engineer in maritime electrotechnics and he is a certified electrician. At the Norwegian Navy Submarine school he worked as a head instructor in the Ula-class submarine simulator in Bergen and also served as a navy diver during the submarine period. In resent years he completed further education within adult pedagogy, crew resource management, project management and learning styles. LtCdr Isaksen has also been responsible for the development of NoD Academy's ADL development methodology and 2 major e-learning projects.

**Pål André Ramberg** is an educated teacher and also holds a master in Information Systems Management. In recent years he has completed further education within adult pedagogy and project management. He has been working as an advisor for the Norwegian Defence Academy for three years and has prior experiences from being a High School teacher. Ramberg is now primarily working with education and development of NoD's Human Resource Management System, but is also involved in different projects. During the last couple of years he has been involved in different initiatives to online and blended learning.

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## INTRODUCTION

The Norwegian Defence (NoD) is undergoing their most extensive transformation process ever. In order for this transformation to be successful there is a great need for continuous skills development. The objective of the research was to make a contribution to how the NoD can increase the likelihood of succeeding with the delivery of material for necessary skills development.

### Didactic Relational Theory Model (DRT)

Bjorndal & Lieberg (Nordskog & Popperud, 2000) present a model for relevant factors that one has to take account of in order to succeed with knowledge dissemination. The model is known as the Didactic Relational Theory model (DRT). It emphasises 6 different relevant factors: *goals*, *framework*, *work methods*, *participant*, *content* and *assessment*. All these factors are mutually related and must be considered in all stages of knowledge dissemination. Focus in this paper is limited to *working methods.*

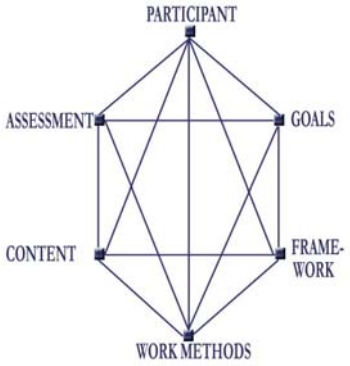


Figure 1: DRT model

### Working methods

Loeng et al. (2001) present 5 main categories of working methods in connection with knowledge dissemination:

Table 1: Different working methods

| | |
|---|---|
| **Small group learning**: | A method that from a qualitative perspective builds on learning through cooperation (Stensaasen & Sletta, 1993). One learns in an environment in which the participants mutually support each other. |
| **Discussion**: | Learning based on the free exchange of academically relevant opinions between all participants in a group. |
| **Case method**: | Learning activities that take as their starting point a description of a situation. Working with cases usually takes place in a group, but can also be done individually. |
| **DSI**<br>**Demonstration**<br>**Simulation**<br>**Instruction** | One combines the *demonstration* of skills that are difficult to describe, the *simulation* of a true to life situation as well as *instruction* that will result in the acquisition of the skills by the students. *Digital learning* is usually defined as being within this category of work methods. |
| **Lectures**: | One-way communication from an active lecturer to receiving participants. |

### Digital learning as a working method

The paper focuses on *digital learning*, which is a work method most strongly associated with DSI according to Loeng et al's categorisation. In their 'pedagogic house' Torgersen & Vavik (2004) divide teaching methods into digital and analogue learning. Regardless of whether one is talking about digital or analogue learning, these arenas contain three main elements.

Table 2: Main elements in learning

| | |
|---|---|
| **Learning medium** (What is used?) | Classroom, PC, overheads, projector |
| Availability of **subject material** | Paper, books, CD-ROM, Internet |
| Form of **communication** | Between student, teaching supervisor and co-students |

The authors have developed a model based on Torgersen & Vavik (2004), which is shown in Figure 2. The model structures the abovementioned three elements with respect to analogue and digital learning.

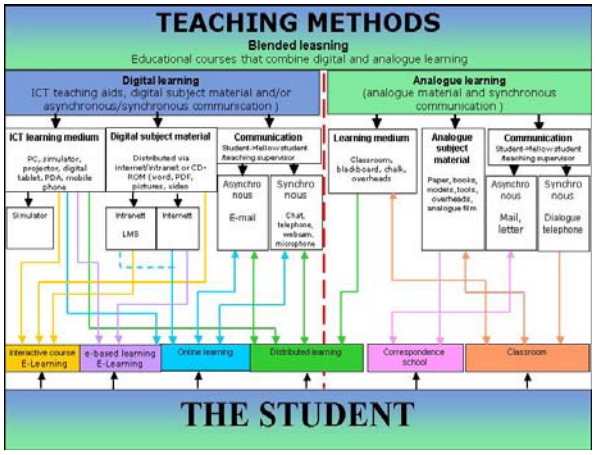


Figure 2: Teaching methods based on main elements

Seen in relation to digital learning, these main elements can be explained in the following manner:

Table 3: Main elements in digital learning

| | |
|---|---|
| **ICT learning aids** | PC, digital tablets, PDA, mobile phones, simulators, |
| Availability of **subject material** | CD-ROM, Internet, intranet |
| **Communication** | (asynchronous/synchronous) |

Based on how the different main elements are utilised, digital learning can be grouped into the following four categories: *interactive course*, *e-based learning*, *online learning* and *distributed learning*. The paper focuses on online learning because this, unlike the other three categories, covers all three of the main elements that come under digital learning.

**Online learning: An approach to digital learning**

This type of digital learning is utilised by most academic institutions that provide education. Online learning usually takes place over long periods and often consists of several modules with continuous assessment.

Table 4: Main elements used in online learning

| | |
|---|---|
| **ICT learning aids** | Classroom, PC, overheads, projector |
| Availability of **subject material** | Subject material is made available via the Internet or intranet. Assignments and compendiums are downloaded to the student's own PC. |
| **Communication** | In online learning it is normal to use both asynchronous and synchronous communication between the students, or between the students and teaching supervisor. Assignment papers are submitted by email to the teacher, while cooperation between the students takes place in chat groups. |

**Online learning and operationalisation of success**

The paper discusses ***how*** the NoD can successfully utilise the online learning work method. In connection with this, the paper discusses how online learning can reinforce existing knowledge vis-à-vis the principles for successful knowledge dissemination. In order to do this, the following questions need to be answered:

1. How can one operationalise measuring success?
2. Which variables affect success?

**How to measure success**

Some research has been done on success with IT, which, among other things, has resulted in various general models. Seddon & Fraser (1997) created one of the most recognised general models. This shows which factors affect success with IT.

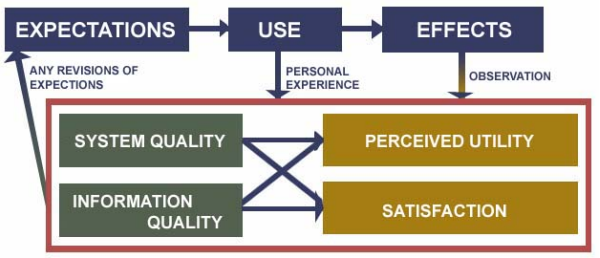


Figure 3: Seddon & Fraser Factors that affect success with IT

The model created by Seddon & Fraser (1997) operationalises the measurement of success through 'perceived utility' and 'satisfaction' among those who use the system. Furthermore they say that 'system quality' and 'information quality' are the primary manipulable factors that influence 'perceived utility' and 'satisfaction'. They expand on this in the model by also emphasising the minor manipulable influencing factors, including users' expectations regarding the net benefit of using the system and how the system is actually used.

When developing IT systems (such as digital learning resources for example) we must first and foremost focus on system quality and information quality since we have less influence over factors such as expectations and use. The paper focuses on system quality with respect to digital learning resources. This does not mean that we regard information quality as less important, but since we wish to contribute with general results that are independent of the information/knowledge that is going to be disseminated, it is natural not to focus on the 'information quality' variable.

**Focus on system quality in the development of online learning**

Laudon & Laudon (2001) describes 'system quality' using the following three key terms*: technology quality, process support and organisation adaptation.* This implies that one can only achieve good system quality if the following criteria are met:

- *Technology quality*: the technological platform must be of good quality.
- *Process support*: the system must support the desired processes.
- *Organisation adaptation*: the system must be adapted to and embedded in the organisation in which it is going to function.

From the perspective of online learning we can interpret these three key terms in the following manner:

- *Technology quality*: the learning management system (LMS) and distribution of the digital academic material must work problem free.
- *Process support*: synonymous with pedagogic quality; the online learning must be constructed in accordance with pedagogic teaching principles that result in good learning for the individual student.
- *Organisation adaptation*: the organisation and its management must arrange things such that individual employees have an opportunity to carry out the online learning.

This paper concentrates on pedagogic quality (process support). Furthermore we have chosen to operationalise pedagogic quality through 'compliance with established teaching principles for the development of online learning'.

**Principles of teaching**

The CAMPVISE principles (FUD, 1997), the MAKVISIT principles (Torgersen & Vavik, 2004), the TOMAS principles (Torgersen & Vavik, 2004) and Gagné's principles for good learning (Sanchez, 2003) are all examples of established principles of teaching in Norwegian education communities.

**CAMPVISE Principles of teaching**

The current Norwegian curriculum for primary and lower and upper secondary school education (L97) involves 8 teaching principles that are known as the CAMPVISE principles (FUD, 1997). These include all the principles that are also described in the so-called MACVISE principles (Nordskog & Popperud, 2000) and in addition progression (P). The CAMPVISE principles involve focusing on the following in the facilitation and implementation of training:

Table 5: CAMPVISE Principles of teaching

| | | |
|---|---|---|
| Concretisation | Activation | Motivation |
| Progression | Variation | Individualisation |
| Socialisation and cooperation | Evaluation | |

**MACVISIT Principles of teaching**

Torgersen & Vavik (2004) present yet another set of variables that affect good teaching. The MACVISIT variables involve focusing on the following in the facilitation and implementation of training:

Table 6: MACVISIT Principles of teaching

| | | |
|---|---|---|
| Motivation | Actualisation & activation | Concretisation |
| Visualisation, guidance & variation | Individuali-sation | S *for* cooperation |
| Integration | Trust, security, enjoyment & belonging | |

**Summary of different principles of teaching**

Table 7: The common denominators in the CAMPVISE and MACVISIT

| | | |
|---|---|---|
| Motivation | Activation | Concretisation |
| S *for* cooperation | Individuali-sation | |

**Choice of teaching principle**

This paper focuses on the teaching principle of motivation since it is regarded as the most basic factor – the very 'driving force' behind all teaching. If no motivation is generated among the students, the chances of the students immersing themselves in the training at all are very small.

**Problem formulation**

Based on our problem analysis we have formulated the following problem:

*How can online learning be facilitated such that the teaching principle of motivation is optimised?*

**Motivation and motivating**

The term motivation derives from the Latin word 'movere', which means to move. This has to do with the basic issue of what driving forces make us act. Kaufmann & Kaufmann (1998) define motivation as follows:

*"Motivation is the biological, psychological and social factors that activate, provide direction and maintain behaviour in varying degrees of intensity in relation to goal achievement"*.

Nordskog & Popperud (2000) expand upon this definition somewhat by concretising motivation as the inner state of excitement of the individual student. This state of excitement must be satisfied to aid increased learning. Arnold Hofset (1995) defines motivation in the following manner:

*"What we do (pedagogically) to create motivation. These are the external means – the carrot and the stick. Incentives, rewards, penalties and motivational means provide us with some opportunities for variation"*.

Motivation can further be categorised into an inner and external dimension, where the inner dimension is created by one's own interest in the teaching going on, while on the other hand the external dimension is created by a desire for, for example, a permanent job, higher salary or other goals that can be characterised as some form of reward.
There are a number of theories associated with motivation. It is normal to group these into four main categories (Kaufmann & Kaufmann, 1998). However, the transitions between these categories are fluid. For example, a needs theory can also be a cognitive motivation theory. An overview of the various categories is provided below:

Table 8: Different categories of motivational theories

| | |
|---|---|
| Needs theories: | Attempts to arrive at a set of basic needs that can explain most of what we humans undertake. The best-known theory was developed by Abraham Maslow, but there are other needs theories such as, for example, Alderfer's ERG theory, McClelland's needs theory and Deci & Ryan's self-determination theory. |
| Cognitive motivation theory: | This theory stresses that actions are a result of a conscious choice. Key terms within this category of theories include 'objective', 'goal management', 'expectations', 'benefit' and |

| | |
|---|---|
| | 'reward'. |
| Social motivation theories: | This type of motivation theory focuses on how the individual's perception of his or her relationship to his or her fellow human beings can have a motivational or demotivational effect. Key theories include 'the equity theory', 'the theory regarding fairness in procedures', 'social information processing theory', etc. |
| Job characteristics theories: | This type of theory focuses on the fact that it is the characteristics of the training or job itself that affect the student's motivation and performance. The best-known theory is Herzberg's two-factor model. |

In order to discuss how online learning can be designed to optimise the teaching principle of motivation we have chosen to make our discussion based on theories from three of these four categories: 'needs theories', 'cognitive motivation theory' and 'job characteristics theories'. 'Social motivation theories' have been left out, because these kind of theories focus on external factors which are difficult to manipulate with respect to training in general. In the following discussion, each of the factors involved in the chosen theories will be discussed in relation to online learning.

**Needs theory**

This paper considers two different approaches to needs theories: Abraham Maslow's and Clayton Alderfer's needs theories and Deci & Ryan`s Self Determination Theory (SDT).
Based on and analysis of these theories the paper discusses how online learning can be facilitated in such a manner that it reinforces *social needs, esteem needs, self-actualisation,* the *need to experience skills*, the *need for self-determination* and the *need to belong* (Eriksen et al., 2003).

**Cognitive motivation theory**

A series of different theories and hypotheses have been developed that are associated with cognitive motivation theory. Two different approaches: the so-called CANE model and the objective theory has been the basis for our discussion.

The CANE model is a two step cognitive based model for work motivation. The models first step attempts to explain what influences the mental effort to acquire knowledge through learning. It suggests that mental effort is a product of the following three variables: *Control value* (Will the effort the learning requires make me more effective?), *Emotions* (Do I feel anything about this?) and *Personal 'agency'* (Can I do this (self-efficacy) and will I be allowed/have an opportunity to do this?)

More specifically this means that one has to focus on why the learning will make the student more effective (control value), one must implement measures that promote positive emotions, and one must focus on reinforcing the self-efficacy of the students through convincing them that they will manage it and that they have the support of the management in carrying out the training.

**Objective theories**

Common for the most important principles here are that specific goals promote effort better than general goals, that difficult goals have a greater motivational effect than easier goals if they are accepted, and that feedback about results leads to greater effort than no feedback does. Concrete feedback provides informative guidance to the student. **Goals/objective** and **feedback** are thus the two most important factors in objective theory.

**Job characteristics theories**

The best-known job characteristics theory dealt with in this paper is the two factor model involving driving and restraining factors developed by Herzberg et al. (1957) (secondary ref. Armstrong, 2001). The theory takes as its starting point the assumption that a person who is enjoying something will also be motivated and productive. Herzberg et al. (1957) (secondary ref. Kaufmann & Kaufmann, 1998) also found that there was a basis for differentiating between two factors:

1. Motivational factors: have a positive effect on enjoyment
2. Hygiene factors: lead to the absence of negative working conditions

As far as motivation is concerned, Herzberg et al. operate with six different factors:

a) *Achievement*: people are motivated by the satisfaction of completing a task, solving problems and seeing the results of the tasks they have carried out.

b) *Recognition*: people are motivated by unambiguous praise for well-performed tasks.

c) *Work itself*: people are motivated when the tasks in themselves are interesting, varied, challenging, creative, etc.

d) *Responsibility*: people are motivated when they get an opportunity to have control over their own work situation and have a certain degree of freedom to determine themselves how tasks should be resolved.

e) *Advancement*: people are motivated if they see that well-performed tasks can lead to career advancement. Seen in relation to training this could involve, for example, training providing certification or something similar that can act as a means of career advancement.

f) *Growth*: people are motivated when they have the time and an opportunity to learn new things and develop new skills. In the further discussion of motivational factors from the perspective of online learning we will not be dealing with this factor, since it is precisely growth that is the goal of all training.

**Summary of motivational factors**

Based on the analysis of the factors discussed earlier, the following 6 different motivational factors are regarded as the most important in relation to online learning. This because we consider that these factors covers the whole picture of how to motivate learners.

Table 9: Chosen motivational factors

| | | |
|---|---|---|
| *Objective/goals* | *Involvement* | *Feedback* |
| *Emotions* | *Socialisation and belonging* | *Self-efficacy* |

The 6 chosen motivational factors are supported by previously carried out studies. An analysis of 8 eLearning courses with responses from 497 respondents carried out by Thurston & Reynolds (2002, US Air Force) indicates that *clear course goals*, *interruptions during the course*, *available feedback during the course*, *self-regulation* and *faith in one's own mastering* are important factors that separated those who completed them from those who did not.

**Operationalisation of our chosen motivational factors vis-à-vis online learning**

Based on experiences from online learning developed and used by Norwegian Defence (NoD) and research within the subject the 6 factors are operationalised to be considered by NoD in the further development and use of online learning.

**Objective (purpose) and goals**

In order to motivate the individual student vis-à-vis online learning it is important to communicate clear goals vis-à-vis the training and the overall objective (purpose) of the training.

As far as objectives are concerned, communicating a clear expression of the purpose of the course will clearly have a motivational effect. It is important that each student sees the immediate benefit in relation to their own personal development as well as the relevance and utilitarian value in relation to their own work situation. For example, one could have a separate 'What's in it for me?' sequence at the start of the course. Here one can illustrate the benefits the training will provide the individual. These could be personal benefits such as certification, study points and advancement or work related benefits such as more efficient work processes.

Using online learning one can also take as one's starting point the individual student's individual objective by giving her or him an opportunity to express their standpoint and their expectations. On the basis of this, one can generate an objective for the training that is based on both the organisation's expectations and objectives, and those of the individual employee.

Referring to clearly expressed and specific training goals vis-à-vis the relevant course at any given time has proven to have a motivational effect. According to Hofset (1995) a list of the course's learning goals can be one of the best short-term goals for mature students who want to learn, since they can cross them off as they master them. Furthermore, the goals' degree of difficulty must be adapted to the target group. This means that each student must have something to strive for. This can best be done if one can differentiate the degree of difficultly according to the individual student's aptitudes and starting point.

This can be operationalised by having different ways of performing a task. One approach can be that the users themselves choose how difficult the training will be. For example in the case of application training[1] one can design simulations that allow the users themselves to choose either a 'show me', 'guide me' or 'let me'

[1] Application training means training users in the use of software or a computer system such as, for example, MS Word, MS Internet Explorer, SAP, DocuLive, etc.

approach. By differentiating between the goals based on the students' expectations one is also facilitating the communication of clear, personal expectations that the individual students can adopt.

Another issue associated with goals is the communication of each individual's progress in relation to achieving the expected goals and progression. For example this could involve illustration using a progression bar/progress indicator or by an advanced menu structure in which course goals that have been achieved are crossed off.

**Involvement**

*Activation*

Activation of the students during an online course is a necessary part of motivational work. Activating can be done in many ways. It can be done using various types of cases, games, simulations, discussion groups and chat, in addition to traditional responses to tasks.

Case based training can be done by giving a student an ongoing task during the course based on the same setting and/or metaphor. This ensures a common theme throughout the entire course. The various tasks linked to the case must be relevant to the individual student and realistic.

Games stimulate the students' competitive instincts and help to make the learning more engaging. Most people will experience games as somewhat pleasurable and fun, which helps to create inner motivation. Dr. Robert Ahlers and Rosemary Garris of the US Navy Submarine Laboratory concluded after a 3 year research project that games work well in a training context because they provide an opportunity for success, create a form of meaning, encourage curiosity and, to a certain degree, fascinate the student (Prensky, 2001).

Simulations can be facilitated in various ways according to the individual's aptitudes as mentioned under objectives/goals.

Discussion groups and chat activate students because it can shed light on a problem in a communal setting and provide them with an opportunity to reflect on it. Discussion groups are based on asynchronous communication, unlike chat, which takes place synchronously. By establishing discussion groups the teaching supervisor has an opportunity to activate the students and at the same time check that the individual students are playing an active part in the discussion. Given that chat takes place in real time there is less of an opportunity and time for reflection. On the other hand chat involves an expectation of quick feedback where students are asked questions in real time. This increases the likelihood of activation.

One is now increasingly seeing in the Norwegian Defence Forces a generation of students who expect learning based on activities supported by the same technology they are familiar with from their leisure activities, such as games etc.

*Influence and participation*

By allowing students themselves to influence and contribute to the teaching system and the scope of the teaching, one generates involvement. This can be operationalised through modularisation[2] and flexibility. By modularising the training, one can differentiate and thus put together training paths based on pre-testing and/or advance dialogue with the teaching supervisor (e.g. via email or chat). Flexibility can be created by, for example, non-fixed start times and free progression. The belief that this is perceived as positive is supported by a survey published by Torstein Rekkedal (1999) (secondary ref. Aleksandersen et al., 2001).

**Feedback**

*Course progress*

Receiving continuous feedback vis-à-vis course progress has a motivational effect on students. This can be operationalised in the form of a progression bar or a progression report during the online course.

*Learning progression*

Frequent and immediate feedback is an essential feature of motivating people during learning. In the case of training involving many small tasks, feedback about whether or not the answer was correct should be displayed immediately. The pleasure of answering an individual task correctly may not be that great, but it will be reinforced by the triumphs following each other so closely (Hofset, 1995). This works best with interactive courses. In the case of online teaching, students should receive feedback about their learning progression from the teaching supervisor. This can be done using synchronous and/or asynchronous communication (chat or mail). The teaching supervisor's ability to monitor the progression and efforts of individual students gives them an

[2] Modularisation means dividing up the course into several different modules that can be connected in different holistic training paths.

opportunity to provide students with feedback as they go. This can supplement and/or replace final feedback.

**Emotions**

Emotions and in particular frame of mind are factors which it is a challenge to influence in connection with online learning. However, by generating emotions one can bring out desired reactions from the students such as, for example, contemplation and reflection. At an eLearning conference in the autumn of 2003 representatives from the entertainment industry focused on playing on emotions in a training context. Their message was that the teaching industry must get better at generating emotions in students like the entertainment industry does in both films and amusement parks. As part of this message they said that the teaching industry must work more on the 'art of storytelling'. Storytelling is one of the most effective aids to generating emotions such as laughter, grief, fear, reflection, etc. Good visualisation is very important when it comes to reinforcing storytelling. Using things such as 3D figures with changing emotional expressions, virtual reality (VR) and artificial intelligence (AI) one can influence a student's frame of mind.


Figure 4: Use of figures in interactive courses

Sound is also an important means of generating emotions. For instance Norwegian Defence Forces successfully uses sound in introductions to online courses with the aim of putting students in the right frame of mind. NoD have also utilised sound in connection with relaxation during the training. The purpose of this was to give students a break in the training and motivate him or her to start the remainder of the training. Surveys show that adults cannot manage to concentrate continuously for more than 1 hour at a time, which is why breaks are important. Based on feedback from students, NoD has made it a requirement to supplement all text with speech during online learning.

Humour can be a good means of attracting attention and it can also influence a student's frame of mind (Hofset, 1995). For example, using recognisable situations from reality in a humorous manner allows one to generate a good frame of mind in the student during the learning process. Humour is however also a difficult means to use, since it in no way must be able to be perceived as offensive, objectionable or discriminatory by any of the students.

**Socialisation and belonging**

A good means as far as online learning is concerned is allowing every student and teaching supervisor to create their own profile that contains both a photo and information about themselves. By making these available to fellow students and teaching supervisor's one can get them to bond and create a virtual social community. This is for instance used at the Norwegian Defence Staff School in Oslo.

One can also encourage socialisation between students and teaching supervisors by facilitating forms of communication such as chat and email. This, together with student and teaching supervisor profiles, helps students to make better use of each other's resources. Technology enables participants' pictures and profiles to be automatically displayed when they participate in discussion groups and when using email and chat. Furthermore one can organise discussion groups linked to topics and subjects through 'Communities of Practice'.

A sense of belonging is closely linked to socialisation. It is important to create a sense of belonging with respect to the company or organisation to which the students belong through internal company online learning. This can, for example, be done by the head of an organisation emphasising the importance of the student developing the relevant skills. This will help to increase a sense of belonging and recognition. It is possible to facilitate this through one-way communication in the form of film clips, sound files or similar means. One example of this in NoD, is the use of Chief of Defence General Sigurd Frisvold (ret) in the introduction to a online course about human recourse management.

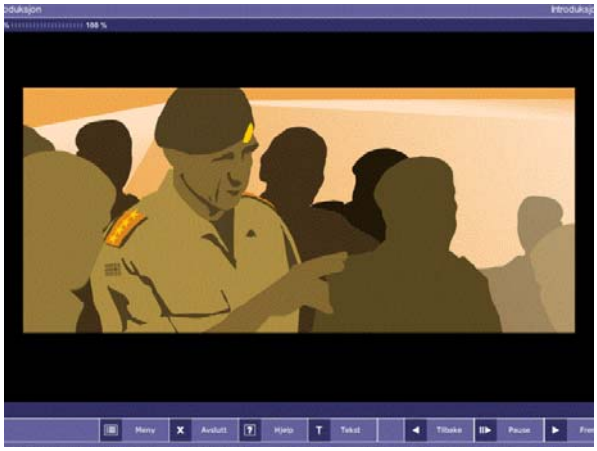

Figure 5: Use of chief of NoD in e-learning

**Self-efficacy**

There are various means of facilitating training that take account of the fact that students confidence in their own ability to learn the relevant subject material will vary. Using a pre-test and/or introductory communication between the teaching supervisor and the individual student gives one an opportunity to ascertain a student's confidence in his or her ability to learn, which one can then take account of in the training.

As step 2 in the CANE model, Clark (Lowyck, 1999) proposes a linear curve correlation between mental effort and confidence in one's ability to master the relevant knowledge acquisition/learning (self-efficacy). The figure below illustrates this correlation.

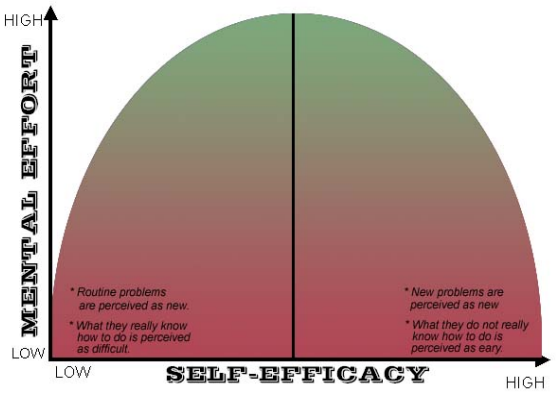


Figure 6: The correlation between mental effort and confidence in one's own ability

On the basis of this figure one can conclude that you must try to catch both people who have too much and those who have too little confidence in their ability to take in the relevant subject material. After detecting different individual starting points one can, for example, create different introductions for different students. Some students will have to be helped to get going by, for example, asking them simple questions to begin with and then gradually increasing the level of difficulty. Others will need to be challenged from the start and others again will perhaps need some 'deprogramming' before the learning can begin. The latter can be operationalised by, for example, expanding on a subject and getting the student to reflect on previously ingrained attitudes and old learning. Some students need a clearly defined path to follow while others want to be free to choose their own paths.

A survey by Thurston & Reynolds (2002, US Air Force) concludes that a clear structure, good user friendliness, and easy access to the course content are important in building up self-efficacy.

**Conclusion**

To make it easier for developers of online learning within NoD (and others) to optimize learner's motivation a checklist has been developed. This checklist has been validated through development of several online courses in NoD such as Human resource and Laws of war. Student's feedback suggests that the developer has succeeded to motivate them. The checklist has proven helpful to developers, remembering to focus on the learners motivational needs during the development of such courses. This list has become a standard piece of the information available to NoD courseware developers and is enclosed NoD`s methodology for developing e-learning.

| 1. Objective (purpose) and goals: | |
|---|---|
| 1.1 | Is the objective/purpose of the course clearly expressed? |
| 1.2 | Is the objective relevant with respect to the student's work situation? |
| 1.3 | Has a 'What's in it for me?' sequence been included as part of the introduction to the course? |
| 1.4 | Have the benefits the training will provide each individual been expressed? |
| 1.5 | Has account been taken of the individual students' expectations in the formulation of the objective? |
| 1.6 | Have specific training goals associated with the course been clearly expressed? |
| 1.7 | Do individual students have an opportunity to cross off as they master the various training goals? |

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| 1.8 | Have the goals been prepared in such a way that all students have something to strive for? |
| 1.9 | Has a progression bar/progress indicator been included that provides a visual indication of the course goals that have been achieved? |
| 2. Involvement: activation, influence and participation | |
| 2.1 | Have different means of activation been developed (cases, games, simulations, discussion groups and/or chat)? |
| 2.2 | Is the course module based? |
| 2.3 | Have pre-tests and/or dialogues been incorporated for differentiated training paths? |
| 2.4 | Is the course flexible vis-à-vis starting and ending times (progression)? |
| 3. Feedback: course progress and academic progression | |
| 3.1 | Is continuous feedback provided regarding course progress from the perspective of total course volume? |
| 3.2 | Is feedback provided immediately (in the case of interactive courses)? |
| 3.3 | Does the student receive feedback vis-à-vis academic progression from the teaching supervisor? |
| 4. Emotions | |
| 4.1 | Have you tried to influence the student's frame of mind using sound? |
| 4.2 | Have you tried to influence the student's frame of mind using photos, animations and/or video? |
| 4.3 | Have you tried to influence the student's frame of mind using humour? |
| 4.4 | Has storytelling been designed into the course as a means? |
| 4.5 | Have you used 3D figures that express emotions, virtual reality (VR) and/or artificial intelligence (AI)? |
| 5. Socialisation and a sense of belonging | |
| 5.1 | Can students and the teaching supervisor quickly and easily enter their own user profile with a photo and personal information in order to aid socialisation? |
| 5.2 | Has chat been included as a form of communication? |
| 5.3 | Has email been included as a form of communication? |
| 5.4 | Does the design incorporate discussion groups linked to specific topics and/or subjects? |
| 5.5 | Does the design include elements that create a sense of belonging to the enterprise in which an important senior manager emphasises the importance of the training? |
| 6. Self-efficacy | |
| 6.1 | Has a pre-test been implemented to ascertain the students' self-perceived mastering ability? |
| 6.2 | Has introductory communication between the teaching supervisor and students been incorporated to ascertain the students' self-perceived mastering ability? |
| 6.3 | Have different introductions been developed in order to influence the degree of the individual student's self-perceived mastering ability? |
| 6.4 | Has the course been designed with a clear structure? |
| 6.5 | Has the course been designed with good user friendliness in mind? |
| 6.6 | Is the course content easily accessible? |

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