Norwegian Defense ADL regulations,
Good directions or just plain distractions

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ABSTRACT

The paper introduces the Norwegian defence (NoD) Advanced distributed learning (ADL) Regulations published early in 2006. After many years of "lawlessness" regarding development and implementation of training, simulation and e-learning defined as ADL, NoD ADL Centre (NoDADLC) was given a task to determine and develop regulations that would release benefits such as reusability, durability, interoperability, affordability and accessibility of all national defence ADL courses.

The time was long overdue to determine national standards and regulations on how to develop and implement ADL within the Norwegian Defence. Up to early 2005 NoD implemented ADL courses that only played on one system, had none or very low reusability, had no lifetime plan, are were not searchable and retrievable. The ADL regulations addresses specific issues such as the use of training need analysis (TNA), technical standards (SCORM, LMS), pedagogical standards and an implementation method. All of these standards and regulations are determined so that all NoD courses for instance can be published directly on the national defence LMS.

Based on the evaluation during the spring 2006 the paper discusses how the regulations are received among the target group in the Norwegian armed forces and the practical use of the regulations. The questions is does the directive give good and long demanded regulations and guidance or does it just create disturbance which is to no benefit for the Norwegian Defence and their ADL developers and users?

ABOUT THE AUTHORS

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Major Arne Broberg has a civilian degree as a teacher but have since 1997 been a regular officer. In recent years he has completed further education within strategic personnel management and competency assessment.
He has been working with training and education as project manager in large joint projects, but since 2001 he has been working at Norwegian Defence ADL Section (NoDADLS) as head of development. Major Broberg was in 2004 in charge of implementing the Norwegian Defence Learning Management System (LMS).

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INTRODUCTION

After many years of "lawlessness" regarding development and implementation of training, simulation and e-learning defined as Advanced distributed learning (ADL), NoD ADL Section (NoDADLS) was given a task to determine and develop regulations that would release benefits such as reusability, durability, interoperability, affordability and accessibility of all national defense ADL courses.

BACKGROUND

From 2001 the use of ADL, and especially e-learning courses, increased in the NoD (NoD). Traditionally there has been little or no joint thinking between the branches and the will to share resources regarding development and implementation of training, simulation and e-learning defined as ADL has been low.

In 2004 NoDADLS was given the task to co-ordinate and control the use and development of ADL in the NoD.

NoDADLS soon experienced that there were no joint regulations and very little cooperation between the different units/branch within the ADL-area. As a result, in 2005 NoDADLS was given the task from the Director of the NoD Education command (2 star general) to determine and develop joint ADL regulations.

PURPOSE OF THE REGULATIONS

The purpose of the ADL-regulations is to lay down rules for the development, procurement and implementation of ADL in the NoD.

The regulations are intended to ensure that ADL is developed in a manner that:

- Ensures that training measures achieve both their effect and training objectives
- Enables implementation in the Norwegian Armed Forces' training systems
- Enables the reuse of teaching materials across services and subject areas.

The implementation of the regulations is intended to release benefits such as reusability, durability, interoperability, affordability and accessibility of all ADL courses used in the NoD.

Problem areas

There were, and still are, many problem areas connected to development, procurement and implementation of ADL in the NoD.
Hopefully many of these problem areas will be resolved or reduced through the implementation and use of the ADL regulations.

Main problem areas are:

1. The different units meet more and more requirements to consider the use of ADL as an alternative learning method. The problem is that NoD units do not have sufficient competence within the field of ADL.
2. Few NoD units have necessary experience to know what to request in their dialogues with potential vendors. Often the dialogues are insufficient because the military employees aren't familiar with the technical LMS requirements and the practical process of developing ADL courses.
3. Vendors develop and deliver courses in many different ways without following any standards or specifications. Even in those cases where courses are said to be SCORM conformant, some will not run on the Learning Management System (LMS) without adjustments.

4. The NoD is spending a lot of time and resources together with the vendors trying to solve the problems in the different courses. Many of the problems are connected to different technical settings.
5. Old ADL courses could not directly be installed in newer versions of the NoD LMS without creating a lot of work and costs
6. There haven't been any possibilities to reuse earlier developed learning content or content developed by other NATO/PfP partners.
7. The few ADL courses implemented in the NoD before 2001 were spread around on many different local systems and on the internet.
8. In many cases the cost on prior developed courses stopped units from using ADL as a learning method.
9. The lack of a joint understanding of the overall process and responsibilities of the vendor and the Defense during this process. This has led to increased costs and delayed ADL projects.
10. Many courses developed for NoD had no or very low impact and were not able to fulfill the learning object stated.
11. Evaluation of ADL courses used in NoD showed that students in some cases lost motivation when attending e-learning courses and preferred traditional learning methods instead of e-learning.

Benefits of determine ADL regulations

With the regulations NoD now have specific joint requirements to handover to potential vendors and developers. With the ADL regulations implemented the employee can concentrate more about the course content and their role as a subject matter expert.

Other important benefit areas are:
1. reusability
   - By following the technical requirements in the regulations all learning objects can be reused in other training measures.
   - The demands for Metadata tagged to every learning object, makes them searchable and retrievable for reuse.

2. durability
   - By following the regulations NoD ensures that courses and learning content will run even if the Learning Management System (LMS) is upgraded, or the LMS is changed.

3. interoperability
   - The regulations ensure that all courses and content developed by NoD can be installed onto any SCORM conformant LMS.

4. affordability
   - The regulations allow the NoD to spend less time defining technical requirements for every single project and as a result save man-hours and costs.
   - Accurate requirements in the regulations lower the cost of developing ADL courses due to lower risk in the project.

5. accessibility
   - The requirement in the regulation regarding bandwidth, different players, software and hardware ensures that the courses are accessible from 90 percent of Personal Computers (PC) within the NoD.

REGULATION CONTENT

NoD ADL regulations deals with four major areas.

- Training need analysis (TNA)
- E-learning standards
- Modeling and simulation standards
- Subject owner's[1] responsibilities
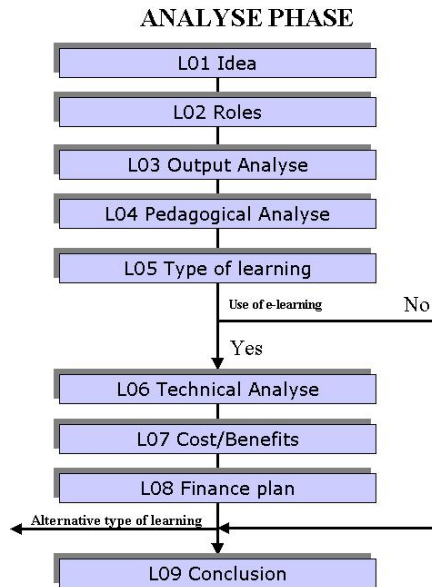
Training Need Analysis (TNA)

The ADL regulations states that a TNA shall be conducted before all development and/or implementation of an ADL training/education measure.

There are many types of TNA diagnostic methods such as Instructional System Design (ISD), System Approach to Training (SAT) and 4 Component Instructional Design (4CID). Within the NoD there are several approaches to the use of TNA.
NoD ADL Centre has developed one TNA methodology for an ADL approach and the Norwegian navy has developed a TNA software tool called "TNA navy".

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[1] Units within the NoD that has a responsibility and subject authority for a defined subject matter such as law of armed conflict or submarine education.

ANALYSE PHASE

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┌─────────────────────────────┐
│ L01 Idea                    │
├─────────────────────────────┤
│ L02 Roles                   │
├─────────────────────────────┤
│ L03 Output Analyse          │
├─────────────────────────────┤
│ L04 Pedagogical Analyse     │
├─────────────────────────────┤
│ L05 Type of learning        │
└─────────────────────────────┘
         Use of e-learning    No
              │ Yes
┌─────────────────────────────┐
│ L06 Technical Analyse       │
├─────────────────────────────┤
│ L07 Cost/Benefits           │
├─────────────────────────────┤
│ L08 Finance plan            │
└─────────────────────────────┘
Alternative type of learning
┌─────────────────────────────┐
│ L09 Conclusion              │
└─────────────────────────────┘
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Figure 1: Example of a diagram from NoDADLS e-learning TNA

Based on the fact that there are many good TNA diagnostic models and approaches to TNA the regulations do not define the use of one specific model. The regulations simply states that:

A TNA shall be conducted prior to the development and/or implementation of an ADL training measure. Based on the guidelines in NoD Basic views of pedagogies (FPG NoD education command 2006) Chapter 4.2, a TNA shall as a *minimum* analyze the following elements:

- Definitions of the effect goals that are to be fulfilled
- Training objectives
- Recommended learning method (work method/teaching method)
- Subject content
- Participant assumptions (analysis of target group)
- Culture (organizational culture)
- Instructor assumptions (definition of the competence required by the instructor)
- Framework factors (financial, personnel, physical and organizational assumptions)
- Evaluation (what, who and how)

The TNA shall summarize and recommend the best training method(s) based on the factors described above.

In addition the regulations demands that all ADL training measures shall evaluate their objectives attainment (effect objectives) within 6 months of their implementation date and present these findings in a report to the executive subject authority (NoDADLS).

e-Learning standards

Technical standards

In 2001 when the NoD started to use e-learning and ADL in a bigger scale, it became clear that to be able to really release benefits as reusability, interoperability (and the other "ilities") it was paramount to state a set of technical standards.

NoD develops more and more courses and although SCORM states how to aggregate files into courses, it is NoD experience that vendors do it in different ways. It is therefore important with technical standards that help the course developers and ensures that the courses can be implemented directly into the NoD LMS.

The main parts of the technical standards are:

- All training measures that are developed and/or procured in the form of e-Learning shall as a minimum adhere to the version of the Sharable Content Object Reference Model (SCORM®) that applies in the Norwegian Armed Forces at any given time.

- All Sharable Content Object (SCO) and learning objects shall be tagged with metadata by using the IEEE standard Learning objects metadata (LOM) pursuant to the Norwegian Armed Forces' standard that applies at any given time.

- The Norwegian Armed Forces metadata standard will be stipulated by NoDADLS and consists at the moment of 10 categories from LOM. These are:

  1.2 Title: Describes the SCO title.
  1.3 Language: State the course language
  1.4 Description: Of the purpose of the SCO, content, learning goal, and demanded pre knowledge
  1.5 Keyword: Shall contain those descriptions that adhere to the SCO

in table 1. In addition comes all other keywords unique for the specific SCO.

Table 1. Metadata category 1.5

Branch	
	Navy
	Army
	Airforce
	National guards
Line	Operational
	Technical
	Administration
Subject area **:**	Electric
	Engine
	Personnel
	Accounting
	Weapons/electronics
	Computer science
	Maintains
	Human resource
	Commissariat

5.2 Learning resource type:
Chooses from table 2

Table 2. Metadata category 5.2

Learning Object	
Assessment object	
Evaluation object	

5.6 Context: Chooses from table 3:

Table 3. Metadata category 5.6

Conscripts	
Conscripts with a degree	
Enlisted with a degree	
Student - Basic officers training	
Non commission officers	
Student - Officer academies	
Regular officer	
Officer with staff college	
Civilian	

5.9 Typical learning time: Chooses from table 4

Table 4. Metadata category 5.9

0-15	minutes
30	minutes
45	minutes
60	minutes
90	minutes
120	minutes

5.10 Description of learning context: Describes the type of learning situation and what competence or skill that is the target for the education/training.

- Courses that are submitted to NoDADLS for testing and implementation must be aggregated like a "content package" pursuant to the specifications in SCORM[®].

  The course(s) shall be pre tested using the ADL test package on www.adlnet.org. Confirmation of a passed test shall be documented upon submission of the course(s) to NoDADLS.

In addition the technical standard also addresses NoD LMS specific issues. One example is additional tracking information needed in the manifest file to ensure a correct implementation into NoD LMS.

Pedagogical standards

Subject owners and developers of ADL must adhere to the pedagogic standards stipulated by NoDADLS to ensure that all training measures within ADL:

- Are of good quality
- Are developed in such a way that they motivate the students
- Fulfill both the effect objectives and the training objectives.

On the basis of research, studies, and evaluations, the following standards have been stipulated for the procurement and development of ADL in the Norwegian Armed Forces. The standards are not based on a specific teaching philosophy, but are general ADL pedagogic standards.

The pedagogic standards address the following topics:

Communication of objectives
- Effect objectives shall be described in the training measure's introduction.
- The learning objectives shall be described for each SCO and for the training measure as a whole. The descriptions must differentiate between knowledge, skills, and attitude objectives.

Sound effects
- It must be possible for the student to turn the sound and speech off.
- Where sound effects are used, these must be natural and realistic.
- Sound effects shall only be used where they are appropriate and increase the learning effect and/or user friendliness.
- Sound effects used as feedback regarding a student's actions shall also be communicated via graphics or text.

Speech
- Speech shall be used when explaining graphics used in the course. In these circumstances the use of text shall be limited to bullet points.
- It must be possible for the user to select text as a replacement for speech.

Use of text-to-speech translation
- The text-to-speech translation facility shall read the text clearly and in a neutral voice.
- Speech independent of text shall be limited to between 80 and 95 words per minute.
- Comments that are the same as the text shall be limited to between 100 and 125 words per minute.

Text
- Due to the reduced comfort and reading speed onscreen, the use of text shall be limited in comparison with a printed medium.
- Long text blocks with CAPITAL letters or italics must not be used.
- A line of text (page width) shall not contain more than 14 words.
- Body copy shall be 10-12 pixels in size
- Body copy shall be in a sans-serif[2] font, which is easy to read onscreen. Examples of such are Verdana, Arial and Helvetica.

- There should be good contrast between the text and the background. Sharp colours or heavy patterns must not be used as backgrounds for text. Dark text against a light background or a light text against a dark background shall be used.

Scrolling
- Scrolling[3] shall normally not be utilized.

Interactivity
- e-Learning courses shall have a high degree of interactivity.

Design/use of colours
- The courses shall have a single color scheme/color profile that is utilized on all of the pages.
- A limited number of colors shall be used.
- Tone-in-tone shall be used, different shades of colors or complementary colors.
- The design shall communicate who the subject owner is.
- Situations in which a user must differentiate between the colors red and green to understand the context shall be avoided.

Progression
- The user's progress during the completion of the course shall be displayed visually.

SCO course navigation
- All e-Learning courses shall in the course's introduction contain a sequence that informs the user about how one navigates around the course and about which buttons are used in the course.

Navigation buttons in a SCO
- Navigation buttons shall be located in the bottom right of the screen.
- The buttons shall have explanatory text next to the button or as pop-up text when the user rolls the mouse over the button. The colours of the buttons can vary in accordance with the course's colour scheme.

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[2] Sans-serif: fonts with completely regular and straight lines without embellishments of any kind (CAPITAL letters), e.g. Arial. Serif fonts are fonts with lines of uneven thickness; they also have serif embellishments at the end of lines, e.g. Times New Roman.

[3] Scrolling: keyboards or mouse must be used to see all the text or graphics.

- The following standard designs shall be used for navigation buttons/fields when this functionality is used in the course.

Table 5. Standard navigation buttons

Functionality	Symbol
Repetition	
Index	
Text for Speech	
Help	
Start/ Pause	
Menu	
Wordlist	abc
Quit	
Back	
Forward	

Modeling and simulation

The only thing determined under modeling and simulation so fare is a competence plan for simulator instructors within the NoD. There have up until now been no specific demands for an education for NoD simulator instructors.

The regulation demands that personnel who serve as a simulator instructor, within 3 months acquire competence within these following areas:

Conduct simulator training sessions. Including:
- Planning and facilitating simulator training
- Pre brief
- Execution, length of sessions
- Debrief

Evaluation of students
Evaluation of simulator training
Evaluation tools including elements such as:
- Setting of realistic objectives
- Development of realistic test criteria
- How one can ensure the same training

- The use of different tools such as timers and the like

Evaluation of adults
Crew Resource Management (CRM)/group processes including:
- Attitude to security
- Communication (closed loop communication)
- Alertness
- Correct team compositions

Pedagogies as an element in the choice of:
- Training method
- Evaluation method
- Execution of training
- Evaluation situation after concluded training
- Adult pedagogies, the adult student

The competence shall be system-independent, and shall not include technical operation and the individual simulator's operationally related peculiarities.

The training objectives are:

After completing the training the Norwegian Armed Forces' simulator instructors shall possess fundamental competence within:
- Pedagogies/adult pedagogies
- Student evaluation
- Evaluation methods
- Group processes
- Training methodology
- Advantages and disadvantages associated with the use of simulator equipment in learning and practice.

Subject owner's responsibility

The regulations describe subject owner's end-to-end responsibility for all development, procurement and implementation of ADL. This entails:

- Reporting all planned procurement, development and implementation of ADL to their local subject authority or directly to the executive subject authority in those cases where the subject owner is under the authority of a project (NoD Material Command)) or joint departments.
- Projects are responsible for defining a subject owner for any training measure they implement in NoD
- Conduct a TNA in accordance with given guidelines.
- Planning, and making financial and personnel resources available with respect to the

development and procurement of ADL training measures. The statutory regulations for public procurements shall be complied with.

- Ensure that subordinate personnel who are working as simulator instructors possess adequate competence pursuant to the requirements in the regulations.

IMPLEMENTATION

Even though the regulations were not officially signed before April 21st 2006, earlier versions have been in effect since January 1st 2005. These earlier versions contained NoDADLS methodology for developing e-learning and both technical and pedagogical standards.

The task to develop and implement ADL regulations was based on the use and experience of the prior developed methodology and standards. To make sure that the regulations were well received, NoDADLS involved local ADL units in the process of developing it.

Figure 2: Organization of NoD ADL authorities

It was very important to get the Director of the NoDED to approve and sign the regulations. This gives NoDADLS a sufficient mandate to implement and enforce the regulations throughout the NoD. Every major unit in the NoD has received a copy of the regulations thru the chain of command and has been presented in various forums (ex NoD ADL Conference 2006).

EVALUATION

Evaluation of the development and the implementation of the regulations has given a lot of useful insight that can be useful to others. There are some aspects from the evaluation that's important for other ADL authorities to consider when developing their own national ADL regulations.

Development

1. Get an official task thru chain of command to develop ADL regulations, this will make it easier to get it approved and signed.
2. Include representatives from the local ADL units in the developing process. This will ensure that the regulations are better received among those who will be influenced the most.
3. Do not make the regulations to strict; leave some room for adjustments to special local needs.
4. Make plans for updating the regulations once or twice a year. Standards are one of the things that evolve as time goes by and you may have to change them of add some more.

Implementation

1. Send the regulation directly to the user in addition thru the chain of command to make sure that units that need it the most, gets it first
2. If your native language is not English, translate your regulations. You will benefit from this when you cooperate with, procure or implementing course from other countries.
3. The implementation of TNA to new users demands additional education and guidance.
4. Be ready to educate the user in how to practically use the regulations.
5. Make the regulations open to all interested parties. It is a very useful asset for vendors and developers.

Use of the regulations

1. The need for ADL regulations were demanded among local ADL units and were therefore well received throughout the NoD.
2. Some of the users find the regulations more time consuming at first, but see as the developing project goes by that it actually

saves time and the quality of the learning increases.

3. Subject owners and units find it easier and timesaving to deal with vendors. The regulations give answers to a lot of the questions vendors normally asks.
4. ADL Subject authorities must be prepared to guide units and subject owners in the use of the regulations at first. This will demand resources and time.
5. Subject owners and units need help and guidance in conducting TNA.
6. Some of the users like to learn about the back ground of the standards and to learn more about them in details.

Benefits

Already NoDADLS sees benefits of implementing the ADL regulations. These are:

1. The regulations have given NoDADLS a better ability to control and coordinate ADL initiative in the NoD
2. NoD is spending **less time** solving technical issues during course implementation to NoD LMS
3. Courses and learning object can be **reused** between branches and units
4. Learning object is made **searchable** with the use of Metadata
5. All courses are SCORM conformant and can be **implemented directly** into NoD LMS
6. NoD developed courses and learning objects can be **reused** by NATO/PfP partners
7. The average cost of developing courses in cooperation with vendors has decreased
8. More and more unit considers using ADL as a training /education measure
9. Responsible units and subject owners have a understanding of the importance of TNA`s.

THE WAY AHEAD

NoD ADL Section will continue enforce the regulations. Further plans throughout 2006 are to develop and publish guidance documents within these areas:

1. Guidance in conducting a TNA

2. Guidance and additional information to the technical standards.
3. Guidance and additional information to the technical standards.

In addition NoDADLS will continue the work of defining standards for the field of modeling and simulation.

NoDADLS will continue to further evaluate, develop and update the regulations.

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