



Flipping Army Conscripts' Training with the Support of ADL Learning Assets – Rewards and Challenges in the Context of Finnish Army Reserve Officer Training

RESEARCH ARTICLE

JARKKO KOSONEN

JENNA VEKKAILA

HENRI PULLINEN

SCANDINAVIAN
MILITARY STUDIES

*Author affiliations can be found in the back matter of this article

ABSTRACT

In this article, we explore the experiences of military instructors with the introduction and application of the pedagogic method of the flipped classroom when supported by advanced distributed learning (ADL). The data were collected from interviews with eight instructors from the Reserve Officer School in the Finnish Defence Forces, all of whom have employed flipped classroom and ADL methods in their conscript training. The findings showed that the approach towards ADL and flipped classroom pedagogy varied, ranging from rejection to a focus on rewards and benefits, and from neutrality to an active appreciation of its potential for development. The motives reflecting these pedagogical and learning technology innovations were related to instructors, learners, subject matters, pedagogical methods, technology, resources, and the structures of the military education system. We suggest that scholars and practitioners of military pedagogy should focus on developing better technology infrastructure and accessibility for the end-user, the self-regulation and study skills of conscripts, and on applying modern pedagogical methods in practice. Further, the capacity of the military instructor to successfully employ learning technologies is contingent on the implementation of specific measures and strategies.

CORRESPONDING AUTHOR:

Jarkko Kosonen

Army Command Finland, FI

jarkko.kosonen@mil.fi

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INTRODUCTION

The 2010s were a period of global digitalization and innovation in pedagogy and educational technologies. Societal digitalization, extending to our quotidian lives, offers great potential for education and training, both in the civil and military contexts. The new generations entering conscript service and both officer and non-commissioned officer training are increasingly native to technology (Cilliers, 2017). Having grown up with technology, they use it for communication, networking, information-seeking, and for learning activities. Learning technologies are widely employed in the Scandinavian education system, from early childhood on (see, for example, Vuorio et al., 2021, pp. 33–39); digital learning environments and tools have found their way to the classroom in support of student participation, collaboration skills, collaborative knowledge-building, and personal learning paths.

Modern conscripts, with their level of education and improved learning abilities, present a challenge to traditional military training methods, pedagogy, and trainers. Because of the acceptability of conscription, service motivation, and experience of the relevance of conscription, the teaching methods used in military service must inspire incoming service-members. It was in this context that the Finnish Defence Forces (FDF) instituted the “Training 2020” program, aiming at better cost-effectiveness, more efficient learning results, and improving the combat performance of the troops being trained.¹ Time and other training resources of a conscription-based military are limited; thus, modern and motivating military pedagogical strategies are necessary to ensure that conscripts develop sufficient skills, capabilities, physical performance, and the willingness to defend the country (Pulkka, 2020).

Both to align the educational and pedagogical approaches to the Finnish educational system and to meet the needs of the modern learner, the FDF has incorporated modern pedagogic methods, including flipped classroom and advanced distributed learning (ADL), in conscript-training within the Training 2020 programme (Finnish Defence Forces, 2019). This constitutes a shift in an established pedagogical paradigm. The FDF seeks to improve the learner-centeredness, the motivation of trainees, and wider learning outcomes by developing constructive alignment in course design and the structure, methods, and digital learning assets of conscript training (Halonen, 2020, pp. 107–111; Vuoksenranta & Kurjenniemi-Nurmi, 2020, p. 67; Finnish Defence Forces, 2019). This study provides initial insights into this paradigm shift by considering perceptions of a flipped classroom design and its ADL implementations² in conscript training among military instructors from the Finnish Army’s Reserve officer school (ROS).

The case unit, a Finnish Army reserve office course (ROC), was chosen because it represents a context with an engaged atmosphere and experienced instructors to develop and implement the modern pedagogical methods in military training. The student group can be considered highly motivated. This twice-a-year course has approximately 70 instructors and over 600 officer students. This case study was carried out using qualitative data collection and analysis methods to explore the military instructors’ perceptions of flipped classroom design and its ADL implementation in conscript training.

CENTRAL CONCEPTS AND STATE OF THE ART

THE FLIPPED CLASSROOM AND THE FLIPPED LEARNING APPROACH

Over the last decade, flipped, or “inverted,” pedagogical approaches, have become a conspicuously popular educational trend. While flipped approaches have been used widely all over the world, a lack of consensus exists on how exactly the flipped approach should be referred to and implemented in teaching and learning processes (for example, Alten et al., 2019; Giannakos, Krogstie, & Sampson, 2018).

¹ According to the Finnish Defence Forces, “the implementation of the Training 2020 Programme will facilitate developing the call-up system, service selections, training system entity as well as methods of instruction. The objective involves transforming the training path undertaken by a person liable for military service all the way from being liable for the call-ups to becoming part of the reserve to feature optimally fluent transitions along the way” (Finnish Defence Forces, 2019).

² FDF utilizes the open-source learning platform, Moodle Learning Management System (LMS), to deliver training to a variety of personnel groups for the purpose of Advanced Distributed Learning (ADL). Conscripts gain access to the web-based version of Moodle, thereby limiting their interaction to public information. Within the administrative internal network, the operational Moodle environment enables the regular staff to engage in learning activities involving the utilization and processing of information in compliance with restricted security classifications.

Depending on the context, two different concepts are typically used as synonyms: “flipped learning” represents the perspective of the student; “flipped classroom” represents that of the instructor (Alten et al., 2019; Brewer & Movahedazarhouligh, 2018; Lo & Hew, 2017; Zainuddin & Halili, 2016). Furthermore, “flipped classroom” is also considered to indicate technical aspects of an instructional method, reversing the actions of instructor and student (Toivola & Silfverberg, 2014). Indeed, the flipped learning methodology seeks to flip both actions and pedagogical assumptions about teaching and learning, aiming at promoting self-regulation and autonomy on the part of the student (Toivola, & Silfverberg, 2014).

Based on the literature, the various flipped approaches share a similar understanding of the basis of constructivist and social-constructivist perspectives on learning, emphasizing the active role of the learner in constructing knowledge and the importance of interaction between learners, instructors, and peers (see, for example, Stöhr & Adawi, 2018; Betihavas et al., 2016; Lai & Hwang, 2016; Sohrabi & Iradj, 2016). Constructivist learning theory is addressed in greater detail in the theoretical section below.

Prepared out-of-class self-study on learning activities assisted by well-designed and motivating learning materials strengthen the active role and learning outcomes of learners (see Alten et al., 2019; Giannakos et al., 2018). The key learning activities usually consist of the activation of the student’s pre-existing knowledge and understanding of the content matter, self-study of the basic knowledge, and testing what one has understood. The material may include videos, readings, quizzes, discussions, audio lectures, and online modules (Akçayır & Akçayır, 2018). One line of pedagogical research defines flipped designs as explicitly requiring technology-based learning materials and resources, such as online videos (see, for example, Bishop & Verleger, 2013; Zainuddin & Halili, 2016; Lo & Hew, 2017; Lo, Hew, & Chen, 2017). Others rely more on the generic definition of flipped designs, in which the medium of the self-study learning materials and resources do not define the flipped learning (see Akçayır & Akçayır, 2018; Alten et al., 2019; O’Flaherty & Phillips, 2015). In this study we rely on this generic understanding of flipped designs and consider that the medium students use for self-study itself does not affect learning in general: what is key is the manner in which the material or resources activate the student’s learning and preparedness to studying new phenomena, knowledge, and skills.

Self-study is followed by instructor-led teaching and learning activities. The instructor-led learning activities are dedicated to using the learning material and resources, and focusing on critical knowledge and competences (see, for example, Alten et al., 2019; Giannakos et al., 2018; Lundin et al., 2018). The learning activities typically rely on social interaction and collaboration; this includes feedback, discussion, group activities, demonstrations, and hands-on activities (Akçayır & Akçayır, 2018). Since the focus of the instructor-led in-class activities is not merely the transmission of knowledge from instructor to student, the instructor is able to focus on both guiding the students to apply the knowledge and solve problems and on practical training.

Previous studies have identified that flipped approaches benefit learning and instruction in several ways, positively affecting both the student’s achievement and engagement (Alten et al., 2019, Awidi & Paynter, 2019; Brewer & Movahedazarhouligh, 2018; Giannakos et al., 2018, Akçayır & Akçayır, 2018). In their review studies on empirical flipped learning and classroom research, for instance, Akçayır and Akçayır (2018) and Giannakos and his colleagues (2018) identified that implementing flipped design in courses increased student satisfaction, positive experiences, motivation, and engagement with the instruction. There are also indications of improvements in student learning performance and outcomes when measured by test scores and course grades (Akçayır & Akçayır, 2018; Giannakos et al., 2018, Zainuddin & Halili, 2016). Moreover, flipped designs have been shown to be conducive for learning activities (encouraging possibilities for interaction in a course, for example) and improving the student’s learning habits, discussion activity and cooperative learning (Giannakos et al., 2018).

While instructors have identified the flexibility of the flipped approach as conferring a noticeable pedagogical advantage (Hardin & Koppenhaver, 2016), there is also evidence that implementing a flipped course design can pose challenges, causing dissatisfaction for instructors and students alike (Akçayır & Akçayır, 2018; Brewer & Movahedazarhouligh, 2018; Giannakos et al., 2018; Lo et al., 2017). Some results suggest, for instance, that flipped design requires more time both from instructors and from students and entails a high workload,

particularly when implemented for the first time (Akçayır & Akçayır, 2018; Giannakos et al., 2018). There are studies indicating that, for instructors, such challenges may stem from unfamiliarity with the flipped techniques and the time-consuming preparation of the flipped materials (Chen, 2016; Giannakos et al., 2018). From the student's point of view, research suggests that some students avoid participating in the out-of-class activities (Lo et al., 2017); this may be explained by attitudes to learning and an underdevelopment of the skills required to plan and regulate self-study (Sun, Wu, & Lee, 2017). Other challenges to the use of flipped approaches arrive in the form of technical and technological problems, including issues of accessibility (Akçayır & Akçayır, 2018).

ADVANCED DISTRIBUTED LEARNING

“Advanced Distributed Learning” (ADL) refers to models of instruction and methods of teaching that are not tied to space and time through the use of technologies (NATO Training Group, 2019; Fletcher et al., 2007, p. 96; ODUSD[R], 1999). The term also refers to the procedures, processes, standards, and digital architectures that facilitate learning, the accreditation of learning, and the employment of similar technologies across different education systems (Muratovic et al., 2019; NATO Training Group, 2019; Durlach & Johnson, 2014; ODUSD[R], 1999). There is significant overlap between ADL and e-learning, which is understood as “learning supported by digital electronic tools and media” (Hoppe et al., 2003, p. 255).

ADL has been developed and promoted to incorporate the benefits of technology-based instruction and performance aiding learning in practice (Wisher & Fletcher, 2004, pp. 7–19). It was initiated to make education, training, and life-long learning accessible at any time, in any place (Fletcher et al., 2007, pp. 96–98). ADL as a term and a concept has been linked to governmental, and especially military, contexts. Coinciding with the beginning of the transition to the modern internet, the ADL initiative was described in 1999 by the U.S. Department of Defense as “a structured, adaptive, collaborative effort between the public and private sectors to develop the standards, tools, and learning content for the future learning environment” (ODUSD[R], 1999, pp. 5–8). This initiative still conducts and coordinates ADL research and development efforts for the U.S. government and for NATO and learning professionals, as the materials on the [Advanced Distributed Learning Initiative site](#) confirm. While ADL is not restricted to the military domain, a large part of ADL-related publications originates from military academies and institutions.

According to a modern perception based on research and a practical pedagogical model, the ADL initiative focuses on the use of learning objects as a way to make instructional materials accessible. For example, Fletcher and his colleagues (2007) summarize that ADL instructional objects are digital, sharable, and reusable entities that can be used for learning, and are available to learners anytime, anywhere, usually on the World Wide Web. Although web-based instruction is an important aspect of ADL, ADL materials may be delivered by any means. The objects can be downloaded or otherwise accessed, used, and reused by learners for as many different purposes and in as many learning contexts as desired (Fletcher et al. 2007, p. 96). In this context, ADL incorporates everything required to provide learning across time and space, bureaucratic borders, and different education systems. It has a fairly long history of development and the inclusion of a military point of view makes ADL a potential asset for the FDF.

RESEARCH CONTRIBUTION

This article addresses a significant research gap regarding the utilization of flipped learning in the specific context of Finnish Army conscript training. By identifying and comprehending the potentialities and challenges associated with flipped learning and its integration with ADL technologies, this study aims to contribute to the understanding of its applicability within Finnish conscript training. To achieve this objective, the research question “What are the challenges and potential of incorporating the flipped learning methodology and ADL learning technologies and activities in military conscript training from the perspective of the trainer's orientation?” was formulated within the framework of the Army Reserve Officer Course.

Overall, this study and its theoretical framework support and complement other recent findings on the implementation of flipped approaches to education, mainly in civilian contexts. Its findings are in line with studies that have identified challenges (technology-related failings, deficient skills on the part of students and instructors, and limited time resources, for example) understood to impede the implementation of ADL-supported flipped designs (Akçayır & Akçayır, 2018; Chen, 2016; Giannakos et al., 2018). On the other hand, the findings also confirm existing results indicating that ADL-supported flipped approaches have the potential to enhance both learning experiences and the learner's active role and to advance variation in teaching methods (Akçayır & Akçayır, 2018; Giannakos et al., 2018). This study goes deeper, however, providing insights into the perspectives of military instructors regarding both the new pedagogical methods and practices. The results suggest that the shift in the pedagogical paradigm was not uniformly accepted, and where it was accepted it was not without a degree of tension. At the same time, the benefits of the ADL-supported flipped approach were critically considered and its potential as a starting point for both individual and educational development was recognized.

This study reveals that both the perspectives of the instructor and the student are included and combined in the instructor's perceptions and discourse related to development. Furthermore, the results suggest that the focus is not only on flipping the actions of the instructor and the student when implementing the instructional method, but on flipping pedagogical assumptions about teaching and learning (see Toivola, & Silfverberg, 2014).

THEORETICAL APPROACHES

CONSTRUCTIVELY ALIGNED TEACHING AND LEARNING MODEL

The term "constructivism" designates a pedagogical approach in which students share responsibility for their learning while negotiating meaning through active participation in the co-creation of shared understanding within the learning context (Reid-Martinez & Grooms, 2021). It has been suggested in military pedagogical research that constructivism offers learning and training principles suited to the military learning environment (Cobos, 2021; Juhary, 2017).

In the FDF, the pedagogical framework driving military training is based on the theoretical approach of constructive alignment. In this perspective, teaching is designed to actively engage students in learning activities that maximize their potential to attain desired learning outcomes. Assessment tasks of constructively aligned training are designed to enable clear judgments as to how well those outcomes have been attained (Biggs, 2014, pp. 5–6). The framework of constructive alignment is composed of four elements:

1. Identifying the intended learning outcomes.
2. Designing assessment tasks to measure attainment of the learning outcomes.
3. Planning learning activities to enable students to develop the skills, knowledge and understandings described in the intended learning outcomes and measured by assessment.
4. Choosing the content required to support the learning activities (Biggs & Tang, 2011).

The constructive alignment model applied in FDF military training comprises six components:

1. Identifying learning objectives and outcomes.
2. Choosing and identifying the content.
3. Planning learning methods and activities.
4. Planning and requesting the resources that support learning.
5. Designing assessment, both learning outcomes and pedagogical design.
6. Reflecting on the educational and organization culture to support the implementation of teaching and better learning outcomes.

The developmental psychologist Jean Piaget’s constructivist approach emphasizes that children actively construct knowledge through interaction with their environment, where cognitive development occurs through process of assimilation and accommodation (Ackermann, 2001; Juhary, 2017; Piaget, 1978), while for the psychologist John Dewey, constructivism emphasizes the importance of experiential learning, where students actively engage with real-world problems to construct their understanding (Hickman, Neubert & Reich, 2009; Juhary, 2017). For the Soviet psychologist Lev Vygotsky, sociocultural constructivism highlights the role of social interactions and cultural tools in shaping cognitive development, emphasizing the zone of proximal development and scaffolding (Juhary, 2017; Gredler & Shields, 2008, 74–81); Seymour Papert’s constructionism combines constructionist principles with the use of the learner’s own artefacts and technology, promoting learning experiences and empowering students to create and construct knowledge through meaningful projects interaction with the world (Ackermann, 2001). According to Stephen Elliott and his colleagues, finally, constructivism is “an approach to learning that holds that people actively construct or make their own knowledge and that reality is determined by the experiences of the learner” (Elliott et al., 2000, p. 256).

The theoretical foundation of this study is a constructivist framework derived from the theories of Papert and Vygotsky. We integrate this constructively aligned approach with teaching planning, as proposed by Biggs and Tang (2011). The theoretical framework of our study, then, combines the constructivism-rooted constructive alignment training model and flipped classroom approach with ADL to achieve better learning outcomes. The framework is visualized in Figure 1.

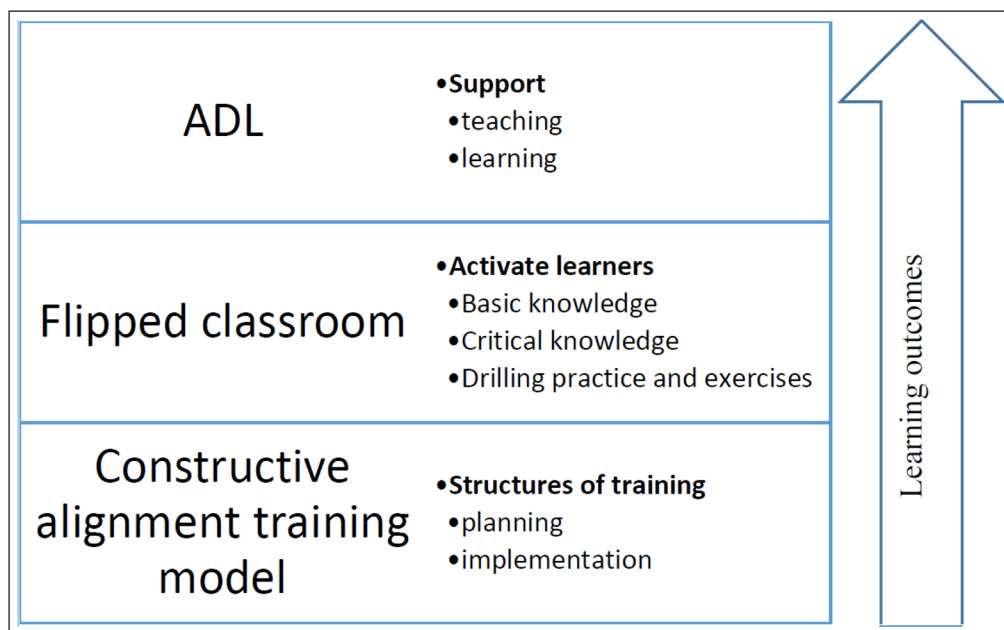


Figure 1 Theoretical framework combining constructive alignment teaching, flipped learning approach and ADL.

There are two dimensions of learning and knowledge in the flipped classroom approach. The first is well-defined self-regulated learning outside the classroom assisted by technology and focusing on fundamental knowledge (Giannakos et al., 2018, p. 30); the second dimension is learning the critical knowledge. Instructor-led tutorials aim to deepen the knowledge and construct the information in collaboration with the learners and the instructors. Active learning activities inside the classroom support the learner’s focus on critical knowledge and critical competencies (Giannakos et al., 2018, p. 30); the battlefield, as phenomenon, may be demonstrated through the use of simulators or virtual learning solutions. The aim of ADL-supported flipped learning is to allow more time for practical training and the application of exercises in different learning environments (live or virtual simulators or live exercises, for example). The reflection phase is an important part of every exercise, deepening the understanding and construction of battlefield phenomena in the conscript’s mind. Our study focuses on the applicability of ADL-supported flipped classroom in practice.

METHODOLOGICAL APPROACHES

PARTICIPANTS AND DATA COLLECTION

The FDF train more than 21,000 conscripts, thousands of reservists, and a couple of thousand regular personnel every year. An average of 30 percent of conscripts are selected for non-commissioned officer training, and only 7 percent are selected for the ROC. The reserve officer course lasted for 16 weeks in the period the data was collected; the length of the course was shortened to 14 weeks in 2021. The course provides the basic skills and knowledge for reserve platoon leaders in different branches.

The focus of the training is command and leadership, branch studies, and co-operation skills to plan and lead combined arms combat operations; thus, reserve officer (RO) training is organized in a battlegroup framing. The Reserve Officer School (ROS) is an organic part – a battalion – of the Army Academy and it has five units conducting RO training. The ROS has been active in developing and reforming the methods and modernization of military training. Among the impacts brought by COVID-19 on the wider FDF, the ROS imposed restrictions on training arrangements, implementing ADL and new pedagogical solutions to palliate the consequences. Due to COVID-19, garrisons had strict visiting restrictions in 2020 and 2021. We were forced to cancel live interviews, but were able to conduct interviews, for a smaller cohort than planned, over Skype.

Kosonen and Vekkaila conducted two online focus group interviews with eight military instructors in order to gain data on the military instructors' perceptions of the topics. These were conducted as semi-structured thematic interviews of the experts (see [Tuomi & Sarajärvi 2018](#), p. 81–89; [Pietilä, 2017](#), pp. 112–122; [Bogner, Littig & Menz, 2009](#); [Kvale, 2007](#); [Kvale, 1996](#)). The interviews attempted to give space to the participants' voices and to understand their perceptions of flipped classroom design and its ADL implementations. This afforded the design of flexible procedures for exploring the participants' experiences and perceptions ([Kvale, 1996](#); [Pietilä, 2017](#)).

The interview questions and instructions were piloted before conducting the interview with the participants; a test interview with two officers recently involved in the Training 2020 programme or developing RO training, was conducted.

Semi-structured focus group interview data and qualitative content analysis were employed to identify the military instructors' perceptions of flipped classroom and ADL implementations. The findings describe the military instructors' perceptions in a certain context and time period within the Finnish Army's ROC. To enhance the trustworthiness and credibility of the current qualitative research, the military instructors' perceptions were explored in the course of group interviews; three researchers analysed the interview data separately. The communicative validity (see [Kvale 1996, 2007](#)) and the ecological validity (see [Bryman 2004](#)) of the results were tested in discussions within the international military ADL community (the NORDEFCON ADL conference of 2021) and national educational and pedagogical community (the PedaForum conference in Finland in 2020).

We conducted the study according to FDF administrative stipulations regarding the research permits and the ethics of humanities research in FDF ([Finnish Defence Forces 2017](#)). The participants for the interviews were recruited via the ROS HQ and the unit commanders. We stressed that the interviewees were to be volunteers. The interviews lasted from one to two hours, and were recorded; they were transcribed by the third author of the current article, Pullinen, before being analysed as outlined below. The authors ensured the confidentiality of the participants by implementing strict protocols to protect their identities and personal information. The study's ethical protocol included obtaining informed oral consent from each participant by providing them with comprehensive information about the study's purpose, procedures, potential risks, and benefits. All data were anonymized when it was transcribed; it was stored securely, with limited access granted only to authorized personnel.

DATA ANALYSIS

The interview data was analysed with qualitative content analysis ([Patton, 1990](#)) and by relying on content-grounded analyses (see, for example, [Mills et al., 2006](#); [Harry et al., 2005](#); [Hsieh & Shannon, 2005](#); [Weber, 1990](#), pp. 40–58). The interview tapes were transcribed into text pages. The process of analysis, visualized in [Figure 2](#), comprised three phases.

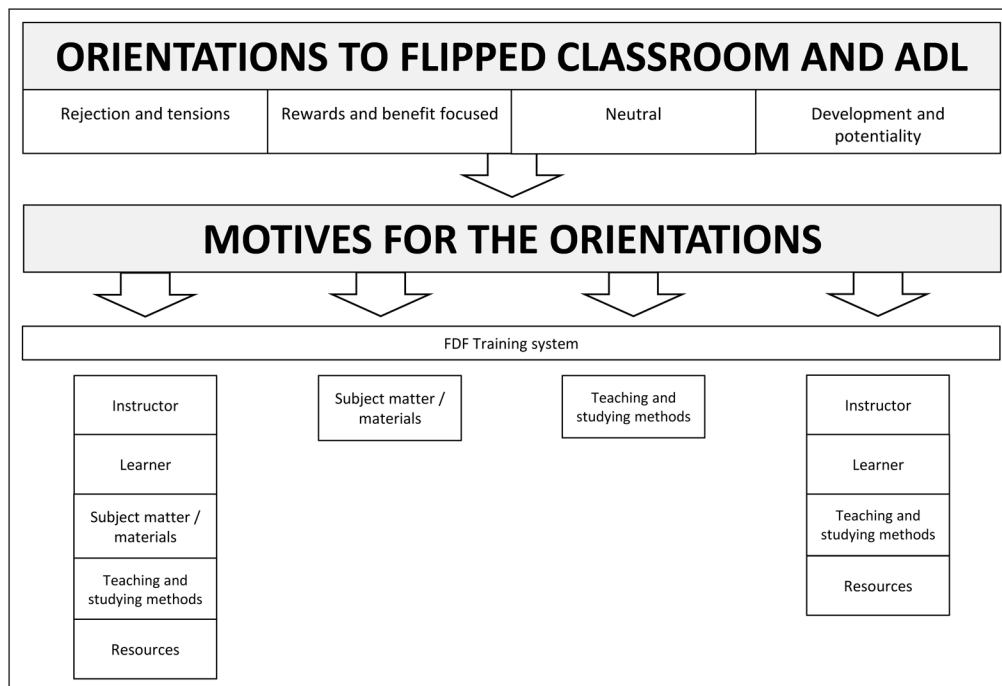


Figure 2 Variations regarding the participants' perceptions of the application of flipped classroom methods and ADL in modern military training.

In the first phase of analysis, the interviews were read through several times to obtain an overall understanding. Text segments in which the participants referred to the flipped classroom method and its ADL implementations were coded into the same basic hermeneutic perspective category. Accordingly, all of the text segments referring to the researched phenomenon in the focus group interview data were grouped together; these formed the ground data for further analysis. The units of analysis included the totality of references to the flipped classroom method and its ADL implementations, ranging from a sentence to dozens of sentences. These text segments included allusions to the flipped classroom method in general, teaching or learning in a flipped classroom design, technology-supported learning, or technology-supported teaching. Next, the analysis focused on the variations included in the participants' perceptions and experiences.

Accordingly, in the second phase, the text segments identified in the first phase were coded into four qualitatively different categories accordingly to the perceived primary category "orientations to flipped classroom and ADL":

- **Rejection and tensions**
- **Rewards- and benefit-focused**
- **Neutral**
- **Development and potentiality**

In the third phase, the orientations identified in the second phase were sub-categorized according to the outlying reasons, referred to as *motives*, for these orientations identified from the interviews:

- **Instructor:** Both pedagogical and technical skills and competences for the implementation of flipped classroom method supported with ADL.
- **Learner:** Learners motivation, self-study skills, and ability to use the Moodle learning management system (LMS) and learning devices.
- **Subject matter and materials:** Restricted material cannot be studied on the Internet; the applicability of flipped learning or ADL to the subject.
- **Teaching and study methods:** Instructors' attitudes to different teaching and studying methods. Students study-skills and engagement to learning.
- **Resources:** The need of time to flip the training, develop learning materials, learn to use the learning tools, the requirements for the amount of learning devices and the speed of the wi-fi.
- **Training system of FDF:** The effect of the training system on the implementation of flipped classroom and ADL in one particular unit.

Conducting the content analysis, two of the authors assessed the categories derived from the analyses independently at the end of each phase in order to guarantee the reliability and credibility of results and the analyses themselves (see, for example, Miles & Huberman, 1994). The third author reviewed the analysis by going through the categories and comparing them with the data. In the few cases of disagreement, a consensus of final categorization was reached through discussion amongst the researchers.

METHODOLOGICAL REFLECTIONS

The approach employed here is not without limitations. The focus group interview participants may have modified their own opinions based on viewpoints that emerged during the discussions; this may in turn have caused some generalization of certain of the perceptions discussed during the interviews. In addition, the focus group interviews were conducted online because of COVID-19 restrictions. Hence, it is possible that the interviewees were not able to employ all the social and interactional interview facilitation aspects in online focus group interviews available in a live interview session. The interviewees were professional soldiers employed by the FDF. The subject of the study was the use of flipped learning and ADL in the training of conscripts. If the research had been conducted in officer training, the results would likely have been similar. We propose, however, that the most significant difference would lie in the students' motivation and readiness for self-efficacy in their own learning.

ANALYSIS

The military instructors described a wide range of flipped classroom and ADL-related perspectives during the interviews (see Figure 2). The instructors' orientations towards flipped classroom and its ADL implementations varied from outright rejection to emphasizing the advantages and potential. Within the motives, in some of their descriptions, the instructors reflected on flipped learning and ADL through the perspectives of the learner or the instructor. In other descriptions, they shared experiences that focused on subject matters compatible with the technology-enhanced flipped classroom method, or on resources and technology required by the new pedagogical method.

REJECTIVE AND DOUBTING ASPECTS

Analysis showed that the military instructors most often emphasized rejective and sceptical attitudes related to the flipped classroom method and especially its ADL implementations. They described the tensions and frictions associated with the new-fangled method and education technology.

In these descriptions, the military instructors typically perceived users' challenging experiences with the learning resources, especially time and the Moodle LMS, challenges with accessibility, and the problems with network and devices as major impediments to the meaningful use of technology supporting the flipped classroom method.

In the following descriptions, the military instructors described the accessibility problems they have faced and observed when certain devices, usually smartphones, are used for studying e-learning contents from the FDF's Moodle LMS. One instructor explained:

The study material is text-based at the moment, and honestly reading it with a mobile phone sucks. When you browse on a small screen, and I have a relatively expensive mobile phone with the biggest screens on the market – and then you have an 18-year-old young man, with basic cell phone. And maybe the biggest challenge I would consider is the conscripts' own devices i.e. their mobile phones. ... Yeah, they can use them but those are not good devices, everybody should have a tablet or a laptop. If you want to write, it's painful to type on a cell phone, you can see only a very small part of the website from the LMS on the screen. You may be able to watch videos, but it may be the only thing that a mobile phone is suitable for in an e-learning environment. (Interviewee 8)

The use of ADL and the Moodle LMS in the FDF was considered to require extra effort and be time-consuming because the servers and network are often overburdened. One interviewee explained:

At the moment, for example, these [FDF] e-learning environments are just so poor, they don't fit naturally, supporting education, but must be included separately, and this extra effort feeds the negative attitude towards these systems. ... And then at the same time there is a beautiful idea that exams are taken at the end of each course [with LMS], which is usually on a Friday, so everyone is working at the same time in LMS and the servers can't withstand that load. It needs to be ensured that, especially if there are a lot of users at the same time, the system must work. It must work on all devices and we should have enough tablets or other devices to use. When I prepared an e-learning day for the latest course, almost all of the officers were teleworking and the FDF network was busy all day. I had to do updates and other work in Moodle [LMS] at night and on my own time. (Interviewee 8)

In light of the interview excerpts, it is evident that conscripts' study skills and motivation play a crucial role in the successful implementation of flipped learning. As one instructor pointed out, the effectiveness of the flipped classroom model heavily relies on a conscript's ability to effectively engage with pre-lecture materials and to take ownership of their learning. One of the military instructors highlighted the tension between students' self-study and taking responsibility and motivation in the following way:

After all, conscripts generally have a good attitude to self-study but do they have the motivation to do an advance task. If conscripts are given independent reading assignments, it is their responsibility to read it. My own experience shows that the result is generally not very good. (Interviewee 3)

According to an interviewee, conscripts' active participation in independent study components and their willingness to collaborate with peers during in-class activities are integral to the success of the flipped classroom. Lack of motivation can hinder the desired engagement and hinder the overall effectiveness of the approach:

But we have got a lot of feedback as to why instructors do not teach things from the beginning. Why do we have to do these [self-study tasks]? Some of them read the paper through once and they think that it's complete. On the other hand, many of them read [the materials] with great detail and do something like concept maps, mind maps, or so on. (Interviewee 3)

Furthermore, the military instructors perceived that their own pedagogical skills as insufficient to effectively employ the flipped classroom method and educational technology, so impeding the use of the method in meaningful ways. They reflected on their dual identity as both trainers and professional soldiers, as well as the competence and skill requirements associated with these two roles. Here are some of their thoughts:

I think that the challenge is that when we read the Instructor's handbook, it describes the instructor as a coach, a teacher, an instructor, etc. I think the biggest challenge is that the Military Academy produces lieutenants with a traditional instructor's mindset and role. It dominates the field of military training. Training 2020's new – some are new and some are not – pedagogical practices might require more teacher-coach aspects to it rather than the traditional instructor mindset. (Interviewee 7)

The following quote shows the pedagogic challenge of utilizing the self-study phase of the flipped classroom method in the instructor-led training phase:

I can give one example of a way that doesn't work. In our unit, close-order drill is being trained as always. The trainees are instructed to familiarize themselves with and learn things from the Close-Order Drill Manual in advance. For some reason, our unit executes this so that even if the trainees are familiar with the topics, the subject is still trained under the guidance of the instructor from the beginning before the conscripts start conducting close-order drill exercises for each other. I think it would be more logical to have them do the close-order drill exercises directly. (Interviewee 6)

In addition, one of the military instructors describes the challenges of the instructors' pedagogical skills and skills to use the educational technology:

We use a lot of PowerPoint. But we don't know how to use slideshows properly. Our PowerPoint slideshows are basically full of text, small text. The instructor just reads the slides aloud for the conscripts. The instructor does not add any value to the teaching event. At the moment, I think we still have a lot of instructors whose pedagogical style fits the tradition "I'll go over the PowerPoint and read the bullets and ask at the end of the lesson if there are any questions." (Interviewee 7)

Some interviewees saw that the training included restricted materials incompatible with ADL (it is not permitted to upload certain kinds of material to Internet) or they were not allowed to use technology to enhance training. The military instructors summarized such perceptions as follows:

If you think about [redacted] branch training, there are quite a few topics that you can train using that flipped classroom method. The regulations and manuals and other resources where the information can be found are classified. In that case I feel it's better to continue with the old method and have lessons on various topics. And then, most of our regulations and manuals are classified, so we can't upload them or other learning materials on Moodle on the public Internet. It is forbidden to upload confidential material in Moodle. So, it cannot be used as an e-library or a data bank, and we still need to deliver printed books for conscripts to read and study. (Interviewee 3)

Occasionally, the military instructors pointed out the challenges existing due to a lack of time to design and employ the flipped classroom method in military conscript training:

But if I was currently at [previous service brigade] and had received new recruits there today, it would be pure chaos and managing chaos... so neither I nor any other instructor would have the time resources that this flipped classroom method requires. Because here [at ROS], during course breaks, we have time to prepare those pedagogical components with which we start building the next course. (Interviewee 7)

DEVELOPMENT AND POTENTIALITY

Notwithstanding this scepticism, analysis shows that instructors also highlighted the added value of the flipped classroom method and its ADL implementations, reflecting on the advantages and opportunities that the flipped classroom and ADL provide in military training when implemented in sound ways.

When describing the positive aspects of the flipped classroom method and its ADL implementations, the military instructors underlined the potential of the new technology-enhanced pedagogical method. They focused especially on the possibilities for deepening learning and for conscripts to enjoy a more active role in the learning process.

One of the military instructors reflected on the strengths of the flipped classroom method from the conscript's point of view and described how instructors and learners' roles are being flipped:

I have understood that traditional teacher-student roles are being flipped. So that through teacher guidance we should get students and learners to teach each other. It is the teamwork, it is the tool or some other pedagogical solution which gets students to teach each other using the kind of language and asking the questions that the phenomenon under consideration raises at that moment. There was a good experience when students did group projects. The assignment was moderately broad, and the end result was I told those students that I would not have been able to teach this subject any more clearly or any better than you now taught each other. I easily recognize that I'm going into too high level of education and after thirty minutes of my monologue, I realize that this might not have matched the learners' initial level at all. Overall ... nowadays the learner should be at the centre, and not the instructor or teacher. Training events are often just like this; in a large group, individual learners do not do so much, and the instructor performs well or brings out the subject to be taught. (Interviewee 7)

One military instructor pointed out that the conscripts may not share the same degree of pre-understanding and skills, and that these can be harmonized through the use of the flipped classroom method:

From my own perspective ... it can be a pretty good tool to make it easier for the student to absorb things. Giving the student an introduction to a topic, being able to start teaching it directly, because often ... some students are more advanced in the learning subject than others. If learners can gain the basics of the subject through this method, then it's pretty good stuff. (Interviewee 3)

The military instructors also thought that according to their own practical experiences the new technologically enhanced pedagogical method appeared to strengthen the learners' satisfaction with military training. Such experiences are summarized as follows:

And conscripts will certainly be positive about it, like [first name] said. So, if you compare it to some 8-hour lesson you're sure to get acquainted with the subject much more comfortably. (Interviewee 1)

Moreover, the military instructors found that the new pedagogical method and ADL to afford the possibility of sharing good practices and of developing the instructor's pedagogical competences. One of the military instructors reflected:

I would see it as a notable opportunity for instructors to get a chance to discuss regarding their experiences with these new methods and their practical implementations. Our approaches to utilizing these tools appear rather unstructured, although we are faced with the imperative to employ them efficiently. Furthermore, we could be able to share ideas on how we have brought outside pedagogical tools such as the use of Flinga and Kahoot into the e-learning environment, in addition to Moodle. I am motivated to develop like this. I am a senior instructor and I have trained these things dozens of times. Hence, I am highly motivated to acquire fresh perspectives on the content and to explore innovative approaches or techniques to facilitate learning. (Interviewee 7)

In addition, the military instructors pointed out how the new pedagogical approach and related ADL implementations were more economical time-wise, allowing a refocusing of the military instructor's time. According to one instructor reflecting on such experiences:

Once the studying and teaching materials have been done in LMS, it saves time in the future. ... For example, once exams have been completed as e-learning forms, the system checks them automatically. It saves a remarkable number of working hours if there is no need for them to be manually checked by the instructors. With these methods, the learners do many more things themselves. This requires that high quality materials be prepared and made available to them. ... After the instructor-led phase, the conscripts share collaborative tasks and the instructor can prepare for the next day's teaching during that time. In the old and traditional method, the instructor would use all the time and energy shouting in front of the class, and would be fully exhausted after the lessons. (Interviewee 2)

Moreover, the military instructors' saw that ADL extended the variety of teaching and studying methods in military training:

ADL-supported teaching is a good thing because it can be used to give reading or other assignments to the conscripts. The assignments and exercises can combine studying, reading, and concrete activities. This supports teaching and learning if it is well-designed and implemented. The soldiers like it and it's easy to follow. (Interviewee 4)

REWARDS AND BENEFITS OR NEUTRAL ASPECTS

In their descriptions, the military instructors occasionally focused on making careful deliberations on and considerations of the flipped classroom method, critically assessing the benefits of the new methods.

In the following, the military instructor reflects the role of ADL in military training and the importance of identifying the parts and phases of training which benefit from utilizing the new methods and technologies:

But, personally, I think the ADL needs to play a supportive role and not lead the training too much. We can't fall in love too much with online learning or LMS. We need to really carefully identify good and valuable practices. Due to the limited time available for education planning, priority must be given to those materials and studies that are made for online-supported study and enable self-study. I attended a seminar that raised fears that ADL or online-assisted teaching and training would displace too much traditional live education. The seminar emphasized that ADL, e-learning systems, and applications should be tools that support the instructor and learning. A system or its use should not be an intrinsic value. (Interviewee 2)

While the military instructors did briefly describe the flipped classroom method in a neutral way, this was typically done with references to their understanding of the implemented method's basic principles:

When a military platoon or a conscript goes through the subject in advance, they may raise the question of why something is being done in particular way. We practise pretty much soldier skills here in the Reserve Officer School, and those are quite mechanical manual skills. If students were to study in advance, for instance, the use of a rocket launcher or basic command orders or something else... In instructor-led session and exercises, more time could be allocated to deepening learning and addressing questions raised by students. This would result in deeper learning and a more active student engagement in the learning process. (Interviewee 8)

DISCUSSION AND CONCLUSION

The results reveal instructors' orientations and their principal motives for the implementation of modern studying and teaching methods, developing both the training itself and themselves as military instructors. Possibilities for development at the levels both of the individual and the educational system itself are narrowed by limited time resources, pre-existing institutional structures, and an education and training emphasizing combat performance. There are limited possibilities for the utilization of ADL assets in Finnish conscript training; several challenges impeding a more thorough development and exploitation of ADL solutions were recognized. These challenges include teaching material classified as restricted, a lack of pedagogically satisfactory e-learning materials, technical defects such as slow networks, and limitations in the Moodle LMS.

Our results emphasize the instructors' desire and motivation to develop military training and to grow, both as soldier and instructor. At this stage, the instructors' competence with regard to developing and making use of the innovative pedagogical solutions in training has been based much on their own interest in studying and adopting new methods and tools. While the experimental training culture emphasized in the Training 2020 programme has provided structural opportunities for instructors to test and introduce contemporary methods to conscript training, the formal training of instructors in the FDF has not kept pace with contemporary development; instructors feel that they should receive more training or opportunities to discuss, brainstorm, and exchange experiences on pedagogical solutions that activate the dissemination of knowledge through peer-learning.

There is an active discussion among military instructors on how to effectively achieve learning objectives using new methods. The aim of goal-directed learning is to foster the development of trainers' expertise, their purposeful work, and improved learning outcomes for learners (see, for example, [Pulkka, 2020, p. 1](#)). The constructivist learning approach aims to integrate social interaction and collaboration into teaching and learning processes (see, for example, [Reid-Martinez & Grooms, 2021](#)). Based on our analysis, we suggest that while military instructors identified the key factors of constructively aligned training ([Biggs & Tang, 2011](#)) and the flipped classroom method ([Toivola & Silfverberg, 2014](#); [Lo & Hew, 2017](#)), they expressed needs for assistance, particularly in the practical implementation of the flipped classroom, such

as facilitating collaboration as a part of flipped learning. Regarding learning objectives, the interviewees emphasized the importance of ensuring critical military skills and the achievement of the unit's military capabilities.

Instructors are keen to implement ADL-supported flipped learning to enhance learner motivation and achieve improved learning outcomes. But this necessitates active engagement from all students in ADL-supported sections, such as self-directed study, online group work, and tests. The flipped classroom method goes beyond simply flipping instruction and teaching; its successful implementation requires comprehensive educational planning and a transformative shift in the pedagogical mindset of trainers and learner alike.

In order to flip the teaching, instructors must pay particular attention to the pedagogically relevant features of flipped learning and self-directed ADL-supported learning when producing learning materials. If the learning materials and the instructor's activities do not support flipped learning, the practical implementation remains limited to self-directed reading of handbooks or presentation slides, and the training is conducted as conventional instructor-led lessons.

Moreover, if only a number of students actively participate while others neglect self-directed tasks, it places a burden on both educators and other learners who must review and cover the fundamentals and details in instructor-led sessions or live exercises. Therefore, the achievement of successful flipped learning and ADL-supported outcomes relies on ensuring active participation from all students and aligning the educational approach with the principles of flipped learning and self-directed learning.

Both Finnish comprehensive and vocational schools have made use of flipped classroom, flipped learning, e-learning methods, and means of prompting individuals to strengthen their own learning skills, especially during the COVID-19 pandemic. The aim of comprehensive education is to ensure a high level of general education at the national level. Pupils learn to be active participants, setting goals and solving problems both independently and together with others. Learning is an integral part of the growth of the individual as a person and the building of a good life in the community. Along with learning new knowledge and skills, the student learns to reflect on their learning, experiences, and feelings (Finnish National Agency for Education, 2014, pp. 7–15). Emphasis is placed on the learner's activity in their own growth, development and knowledge acquisition.

In terms of fostering human growth and development, we see conscript training in the FDF as a continuum of the schooling system. While the use of flipped methods in school education can support their later use in the course of conscript training, the interviews suggested that not all conscripts had the motivation or capacity to adopt a sufficiently active role in their learning to make effective use of methods of this kind. Instructors at ROC are constantly considering how much responsibility for learning can be placed on self-study and ADL supported training. The methods used in flipped training and learning can increase the activity of students in a number of ways. These activities could include teamwork, problem-based tactical planning tasks and extensive, challenging, freely-constructed combat planning, command, and execution tasks. ADL is ideal for actuating and diversifying the flipped classroom.

In the development, experimentation, and implementation of military training and pedagogical methods, the objective is to progress incrementally and to ensure that the new methods function effectively in practice, yielding the learning outcomes desired if the requirements of military capabilities are to be met.

Based on our research findings, we suggest that the flipped classroom approach is an appropriate pedagogical methodology for education planning and aligns well with the constructivist learning perspective. ADL enables the implementation of flipped classroom from the instructor's perspective and flipped learning from the learner's perspective. It facilitates self-directed study of foundational knowledge and enables social interaction between instructors and learners that is not dependent on time or location, as well as utilizing internet resources to support the reception of knowledge.

In the military context, flipped classroom can enhance both cognitive learning and skill-development. ADL-supported fundamental knowledge study frees up time resources for practical training. Critical knowledge is developed through the learner's active engagement and participation, as in military exercises (Giannakos et al., 2018).

Flipped classroom pedagogy and ADL were closely linked in the framework of our study. These strategies were discussed in the interviews as intertwined concepts. While we wanted to keep these concepts separated in the analysis of the data, they became intertwined into a single overarching concept as a result of the qualitative content-grounded nature of that analysis. The results indicate that, in order to support the shift in the pedagogical paradigm in military training with the support of flipped classroom method and the ADL, the focus needs to be on three things.

The first is the stability of the technological infrastructure; sufficient speeds and capacity in networked communication (principally WLAN) are crucial for ensuring blended and ADL-supported military training. The selection of the devices most suitable for training purposes is similarly essential in ensuring effective learning experiences. According to the findings, there exists a need to improve the usability of the devices and LMS in military training to create more engaging end-user experiences, both for learners and for military instructors.

Secondly, there is an urgent need to take better care of pedagogical competence on both the system and individual level. Military instructors should undergo more comprehensive formal education on innovative and constructivist pedagogical methods, along with ADL solutions. Additionally, they should receive on-the-job-training and coaching to apply constructively aligned training (Biggs & Tang, 2011) and effectively integrate flipped learning methods into everyday military training. Allocating resources at the organizational level is also essential for the enhancement of the pedagogical competence of military instructors. Consequently, both the individuals and the organization need to be engaged and committed to the change process.


Thirdly, even though the students coming to military service already have extensive study experience in military training, their general skills and competences need to be supported. For instance, it is suggested that students may need support with their skills to study and regulate their own learning processes in the flipped design (Sun et al., 2017). Military training often poses completely new learning objectives and situations; teaching and study methods that students are used to in civilian education can be implemented somewhat differently, according with the specific needs of military training. Hence, the students are not necessarily able to automatically adjust their learning strategies for these new situations. This often requires instruction strategies consisting of coaching and guidance.

Clearly, more information and deeper understanding are needed. To see these military instructors' perceptions of flipped classroom design and its ADL implementations in a larger context, more data must be collected from instructors representing the various levels and bodies of FDF's military education and training in future research. Moreover, there is an urgent need for a widening of the focus, permitting a fuller study of the student's perspective. How do students themselves experience and perceive the implementation of flipped learning in Finnish military training?

COMPETING INTERESTS

The authors and the military instructors involved in the research interviews were in official service with the FDF in the course of the research and the writing of the article.

AUTHOR AFFILIATIONS

Jarkko Kosonen  orcid.org/0009-0008-5450-0525
Army Command Finland, FI

Jenna Vekkaila  orcid.org/0009-0009-4982-9470
Finnish Defence Forces Shared Services Centre, FI

Henri Pullinen  orcid.org/0009-0007-9417-5440
Defence Command Finland, FI

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