Cadets' Expectations of Their Learning Environment at the National Defence University of Malaysia

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Abstract

The National Defence University of Malaysia (NDUM) is the youngest public university in Malaysia and it is at a phase of looking for a right combination of teaching and learning strategies for the students. This paper attempts to benchmark the best practice from other military learning institutions that can be adapted at the NDUM. Data are gathered from surveys and semi-structured interviews at the NDUM and the first military academy in the U.S., the United States Military Academy, West Point, New York. The results from data collection do not conform to the original hypothesis. In practice, the best learning environment for military students uses, in fact, a combination of various pedagogical approaches.

Keywords: The Thayer System, Didactic Teaching, Authoritarianism, Active Learning, Military Learning Environment.

Introduction

All higher learning institutions must provide the best possible learning environment for the students. This is because the students are one of the main stakeholders in the education business. Inevitably, a new educational institution such as the National Defence University of Malaysia (NDUM) must search for a right combination of teaching and learning strategies for the students. This paper attempts to identify and analyse the best practice from other military learning institutions that can be adapted at the NDUM.

Data are gathered at the NDUM and the first military academy in the U.S., the United States Military Academy, West Point, New York (West Point). This study has used West Point as the reference point mainly because it stresses on conventional teaching and learning approaches and it also integrates e-learning and simulation technologies in its curriculum. By contrast, the NDUM is in the process of determining the best learning approach for its students; it is a reasonable assumption that benchmarking itself against the West Point model could help with the process.

Amongst the questions that need to be analysed and answered is does the NDUM have anything to learn from other military institutions such as West Point? Should the NDUM follow any aspects of the learning and teaching model of West Point? More generally, what role can or should e-learning and simulations play in the modernisation of the Malaysian Armed Forces (MAF)?

The aims of the paper are to benchmark West Point learning environment and to identify how best to utilise new technologies, namely e-learning and simulations in the NDUM. To do so, this paper is divided into several sections. Apart from the introduction, this section discusses both military establishments and their history. The second section analyses the literature on e-learning and simulations in military learning environments. The third section acts as the findings of this paper, whereby an assessment of the hypothesis leads to the arguments of what is the best teaching and learning practice for a military learning environment. A conclusion closes the paper.

The National Defence University of Malaysia

The plan to establish a military academy in Malaysia was first discussed in the 1970s. This plan was based on two urgent needs: firstly, to have a joint-services learning institution that could provide both academic and professional military learning concurrently, and secondly, to house selected trainees from the three different services (Army, Navy and Air Force) under one roof. In this way it was thought that Malaysia could develop an elite officer class. To achieve this, it was vital to create officers across the three military services who understood and respected each other. Bringing potential officers together during the cadet training years was thought to be one way of establishing such bonds.

In 1995, the cabinet approved the formation of the Military Academy of Malaysia, now known as the NDUM. During the early years of establishment, programmes at this academy were based on cooperation between the Ministry of Defence, Malaysia which provided military training programmes and Universiti Teknologi Malaysia (UTM) which provided the academic training component. UTM was a 'natural choice' as the academic partner because of its reputation in engineering degrees. This reflected the pressure on the armed forces to ensure that the training of new military manpower included a large number of well-trained engineers. The first cohort of undergraduate cadet officers totalling 172 started their military and tertiary education at this military academy in June 1995 (*Expand Your Mind, Go Beyond The Limits* 2005).

Before further discussion on the issue of new technologies, it is critical to note that the NDUM has not yet implemented e-learning and simulations across the campus, with the exception of one academic programme explained later. The lack of technological facilities at the NDUM is as surprising as it is dramatic given the MAF's ostensible commitment to military modernisation. Given this great weakness, the singular example of the Maritime Technology Programme at the NDUM, assumes even greater significance. This programme provides training for cadets who will navigate Malaysia's small fleet. To qualify as a navigator of the Navy ships, the NDUM cadets are trained and assessed on the Computer-Based Training laboratories and ship simulator. By insisting on this training programme, this defence university is conforming to the international requirements of the Standard of Training and Watch Keeping Certification 1995. Muirhead (2003) also stressed that such a simulation programme is an important way of improving ship and crew safety. Given that Malaysia's Navy is roaming international waters, the NDUM training programme had no option but to comply with international standards or risk being banned from proceeding beyond territorial waters.

The upgrade of this academy to a full university in 2006 marks the importance of educating future military officers. This university was expected to pioneer the creation of academically trained military leadership capable of placing the nation's security interests into a broader regional and global framework. It needs to be emphasised that the NDUM is located in the context of Malaysian learning environment. The primary influence on Malaysian education, even today, appears to be the long history of traditional ways of learning. These began in the villages and towns of Malaysia and, as elsewhere in the days of the pre-industrial era, were didactic in nature: the providers of knowledge imparted their wisdom to students as part of a top-down, one-way communication process (Smerdon, Burkam & Lee 1999). This process survived into the modern classrooms of Malaysia and was strengthened by the authoritarian tendencies. Colonialism did little to undermine these conservative traditions of obedience to teachers who were assumed to possess superior knowledge. More challenging, elite education was reserved for only a few lucky families so that their children might join the colonial bureaucracy. For the bulk of the population, education was focused on elementary objectives such as reading, writing and numeracy. There was little encouragement in this system towards innovative thinking or learning. Modern criticism of didactic teaching appears to be entirely reasonable – didactic teaching could disseminate simple information but it simultaneously stifled independent thought, creativity and deeper learning processes (Harkin, Turner & Dawn 2001).

While the governing elite sent its children abroad, within Malaysia itself the education system increasingly appeared to limit the ambitions of the non-Malays, in particular the Chinese and Indians. Perhaps Malaysian educational institutions were discouraged from fostering independent attitudes from fear that this would encourage the ethnic minorities to be more independent. With hindsight, this was an unreasonable fear but the race riots of 1969 could have fuelled this misunderstanding. Whatever the

reasons, the Malay-dominated government responded to the fear of racial tension by imposing the National Economic Policy (NEP). What the government did not realise at the time, according to Rodan (2004), was that the NEP risked creating a breed of 'crony' capitalists. Such entrenched interests further damaged Malaysian institutions, including educational ones, by removing their need to be competitive and innovative. The education system in Malaysia has a politically authoritarian environment that stifled debate and intellectual curiosity, which by principles and practice differ greatly from West Point, analysed next.

The United States Military Academy, West Point, New York

It is important to understand how West Point became an elite learning institution. There are various factors contributing to this but only two will be discussed here. The first is West Point's history. The academy was established in 1802, only 26 years after the Declaration of Independence. In the first few years, the academy faced widespread resistance. Many congressmen of the new nation, together with most of the public, were torn between their need for engineers and artillerists and their knowledge that the French Revolution had been betrayed by just such officers (Crackel 2002). Supporting a similar institution could also threaten the new American state. The public needed the 'guardians' to defend them and yet was opposed to the idea of a military academy; they would not want to feed and train those who would be seen as national threats in the future. Thus the establishment of West Point was based on certain conditions. For example, teaching staff and cadets of the academy had to come from society as a whole, not a segment of it; they had to be able to train and lead citizen-soldiers in times of war; and they had to be resistant to using their skills for their own private ends (Ambrose 1999). In the end reservations were set aside, and the opinion that prevailed was one that saw a military academy as providing critical protection for the new nation (Crackel 2002). Surprisingly, in its formative years West Point was best known for its engineering rather than its military curriculum.

This leads to the second factor that gave West Point its unique historical importance: the training it provided for military engineers. West Point became a leading engineering academy. From the early years of its inception, the academy has helped other engineering faculties and schools around the U.S. to design engineering curricula and syllabi. West Point also responded more rapidly than any other American school to shortfalls in the nation's civil engineering needs. It was the first school of civil engineering and remained the leading centre of such instruction until the Civil War (Crackel 2002). Earlier resistance to the academy began to fall, largely as a result of West Point's significant contributions to America's Industrial Revolution. West Point engineers played a critical role in the design and construction of America's most important roads, canals and railway lines in the 19th century. It was this kind of 'national service' that endeared West Pointers to the general public. Serving the country on the infrastructure battlefield was, for many decades, far more important than any conventional military engagement.

The Thayer System

The learning system and environment at West Point is called the Thayer System, which may well prove to be one of the U.S. military's best kept secrets. Its unique blend of learning approaches that incorporate both behaviourist and constructivist principles has created more than nine generations of elite West Point cadets whose educational experience was the best that the U.S. had to offer. Moreover, it was an achievement that seems to have been kept entirely separated from what was happening in civilian higher learning institutions. As Table 1 shows, progressive educational philosophy did not emerge until the early 20th century, and the constructivist school of thought did not develop until the late 1970s. Yet almost 150 years earlier, the Thayer System pre-empted some of constructivism's most important insights. Understanding the Thayer System, which continues to inform the teaching and learning objectives in West Point, is essential in order to understand how the new information communication technology (ICT) opportunities now make it possible for West Pointers to embrace the Thayer System more whole-heartedly.

Table 1. Timelines Showing the Evolution of Learning Principles. Sources: Ambrose (1999); Biggs (1996) Crackel (2002); Dewey (1933); Entwistle (1998); Pavlov (1960)

Time	System/Learning Principles
1817-1833	The Thayer System, West Point – Thayer
1890-1930s	Behaviourism – Pavlov
1897-1950s	Progressive Education – Dewey
Late 1970s onwards	Constructivism – Biggs, Entwistle

The Thayer System, named after the Superintendent of West Point, Slyvanus Thayer, contains principles of learning that reflect both behaviourist and constructivist insights into how the human mind seeks to order new knowledge. Thayer imposed a grading system on the cadets' daily recapitulation of the lessons of the previous day in the classroom. This system ensured that he was able to follow the weekly progress of every cadet. This facilitated another reform: assigning cadets to classes according to their demonstrated competence (Morrison 1986). According to the respondents that the author interviewed, the Thayer System is still in use today. Facilitating the preservation of the learning culture at West Point has been the practice of employing military instructors who have themselves been West Pointers; in 2006, during the author's fieldwork at West Point, about 50 percent of junior military faculty members are West Point graduates.

The Methodology

Data were gathered at two different military establishments, West Point and the NDUM. The instruments used were questionnaires which were distributed to 119 military cadets at West Point and 122 cadets at the NDUM. Semi-structured interviews with 11 teaching and administrative staff of both institutions were also carried out. The results of the questionnaires were analysed using Statistical Packages for Social Sciences Version 11 and the interviews were transcribed based on themes. It is crucial to stress that due to the job nature of the interview respondents from both institutions, their identities could not be revealed. At the same time some documents, such as students' grades, institutional blueprints and teaching materials, could not be accessed due to security purposes.

The Hypothesis

This paper begins with a hypothesis to guide the data collection and analysis process. The hypothesis suggests that new technologies are the most important assets in any 21st century classrooms. This is based on the extensive literature analysed after this section. The hypothesis of the paper is that,

> *The introduction of e-learning and simulation technologies could encourage students' learning at the NDUM.*

At the end of this paper, this hypothesis will be re-assessed to ensure whether the NDUM should adapt, modify or reject it.

e-Learning and Simulations

The term *e-learning* refers to a range of activities that use ICT. These include Internet-based, CD-ROM-based and interactive online teaching, amongst others (Bonk & Wisher 2000). In the context of defence and military institutions, e-learning could be defined as "the collective term describing the learning delivered using electronic devices, including web-based systems and computer and communications technologies anywhere and at any time it is needed or desired" (DELDMC 2001). *Simulation* is specifically designed courseware or programmes to simulate situations/events for the purposes of learning. These simulated situations/events depict scenarios from real life in the expectation that students can learn from reconstructions of events and situations that they are likely to confront in their professional life. Simulations are often built to engage students in situations or events that would be too costly, difficult or hazardous in the real world (Gredler 1996), and so enable them to 'practise' responses

to such situations. One great advantage of simulation is that it allows military trainees to make mistakes without serious consequences (Harris 2002). Since mistakes can be a powerful learning mechanism when they happen in a safe and blame-free environment (Hills 2003), simulation is considered to be one of the best learning tools. Complex operations in particular, can often be explained more effectively through simulations. Cadets at West Point, for example, are often involved in computerised simulations so that they can more readily see how to act and more quickly comprehend the consequences of their actions (Cox 2003).

U.S. Military Expectations for e-Learning and Simulations

In the early 1990s, the U.S. military began to transform its educational programmes at all levels through the application of ICT – networked communication systems and distributed learning technologies. These technologies were called *e-learning* (stand-alone multimedia CD-ROMs or networked materials) and *simulations.* Before this transformation of learning strategies, the traditional method of face-to-face teaching was used. It was the face-to-face teaching approach that saw the rise of the U.S military power after WWII. Despite the successes of this instructional approach during the many decades of West Point's evolution, it was the first Gulf War that convinced military instructors of the benefits of digital technologies. In particular, the capacity of e-learning and simulations to prepare reservists in a timely manner was a primary motive behind the changes that stressed the need for training to be feasible at any time and anywhere (TRADOC 2001). The instances cited above of the effectiveness of e-learning and simulations refer to the non-academic educational and training programmes in the U.S. military. This paper has a different orientation and asks: what roles do e-learning options and simulations play in the *academic courses* at West Point and the NDUM?

West Point management recognised that the process of learning had to become more individualised and customised and that ICT held out the promise of making this possible (Tyler 2002). By accessing knowledge and information through ICTs, students could learn outside the classroom at their own pace. It was also believed that new technologies encouraged students to exercise their minds in a more active manner while simultaneously providing on-the-spot feedback to instructors and exchanging viewpoints with other students (Saita 2003).

The U.S. military has always been a global trendsetter with most learning initiatives, including e-learning (Rosenberg 2001). This is hardly a surprising characteristic given the nature of the military-industrial complex that has increasingly defined the U.S. economy in the post-WWII era (Johnson 2004). Rigorous training had been the hallmark of the U.S. military and it has historically always depended on highly trained personnel. Jones-Harris of Fort Monroe (Staples 2003) is adamant in her statement that e-learning has proven to be an effective tool for the U.S. military. Furthermore, the military has funded many new research and development projects in educational technology (Grimes 2003) mainly through the Defence Advanced Research Projects Agency.

Simulations have also played a pivotal role in the U.S. military's learning programmes. Since the early 1990s, the U.S. military has relied on simulations for learning purposes (Aldrich 2004). At first the military used its simulation programmes to teach reserve soldiers but with the first Gulf War and the need to rapidly increase the knowledge of combatants, simulations were widely used for active personnel as well. The ability of simulation technologies to integrate many aspects of learning has been the key to its importance. According to Chessell and Grisogono (2000),

> The promise of advances in simulation science and IT [information technology] is that a new generation of tools based on synthetic environments, intelligent software agents and powerful visualisation technology will open the doors to study system interactions and correlations.

These tools could enhance and better support the learning environment for military trainees and officers. Between 1993 and 2001, the total amount of money awarded to private companies for these purposes by the U.S. military was USD$4 billion (Blank 2001).

In collecting data from West Point, the author was especially interested to see how this attachment to simulations was reflected in an elite learning environment. The finding section of this paper reports on this.

The Significance of the ICT Revolution in the U.S. Military

The enormous investment that the U.S. military has made in new educational technologies have allowed all cadets to pursue their own self-motivated studies in a manner that was never possible before (see Juhary 2007). The earlier, traditional approaches to learning have been described by many as inspired by *behaviourist* approaches, even though behaviourism emerged as a learning philosophy long after the U.S. military had been established. The behaviourist school of thought was first articulated by Thorndike (1904), Pavlov (1960) and Skinner (1974). What they all shared was the belief that similar to animals, human beings were creatures whose behaviour could be conditioned by repetitive learning exercises in which certain types of 'desirable' acts were rewarded and other, 'undesirable' acts, were not rewarded or 'reinforced'. Taking these ideas into human learning, behaviourist educators insisted that students learnt better when they were "drill[ed] and [forced to] practice" (Skinner 1974). The act of 'learning' was itself defined as something that took place when there was a change in the behaviour of the subject – a change in a manner compliant with the requirements of the instructor (Skinner 1987). Implicit in these views was the notion that the 'teacher' had superior knowledge and was in control of a finite amount of desirable knowledge that had to be imparted to the subjects.

It would be easy to assume that learning environments within a military context have always been dependent on drill-and-practice techniques (van Ree 2002). These techniques, in turn, reflect the view that military discipline is best promoted by ensuring that military trainees acquire skills that enable rapid responses to command. Such assumptions appear to conform to behaviourist expectations. In fact, the first courseware, called CAI or Computer Assisted Instruction, which was designed and introduced in the 1970s (Saettler 1990) applied drill-and-practice techniques to condition students' learning. But are these assumptions appropriate to *all* aspects of education and training in the U.S. military? The learning approach that West Point has been following since the early 19th century, the Thayer System (see Juhary 2007), challenges these simplistic views. In the setting of West Point, the CAI programme represents a short-term training device located within a complex and flexible learning environment.

All in all, the analysis above summarises how the U.S. military, the parent service of West Point graduates, views and utilises new technologies. This analysis is critical to provide some basis for understanding the next section

Findings and Discussion

The fieldwork inside West Point quickly drew the author's attention to things other than the digital technologies being used. The author discovered that the required skills for the 21st century military officers do not rely solely on new technologies. The non-technical characteristics of West Point, including the broader context of its learning environment, have significantly contributed to its prestige, which in turn has played a critical role in generating officers of great ability.

The findings at West Point went well beyond the author's original expectations, which were too focussed on digital technologies rather than the broader learning and teaching environment. The complex learning environment that was found at West Point contrasted strongly with the situation at the NDUM. The following findings explore these differences in greater detail.

An Assessment of the Hypothesis

As was stated earlier, the hypothesis assumes that new technologies can encourage students' learning at the defence university. However, findings from West Point raise three issues.

First, although computer technologies and e-learning are pervasive in West Point, the cadets expressed a strong preference for face-to-face learning (see Table 2). This supports the author's personal observations about the importance of how the classroom situations are established, as well as the non-technological aspects of the West Point learning environment. The author expected to find a much more positive attitude towards e-learning but discovered instead that West Point cadets placed a high value on interacting with their instructors. To duplicate this kind of interactive atmosphere in the NDUM would require a new teaching philosophy that takes the teachers and students away from the authoritarian and didactic habits of the past.

Table 2. The Preferred Mode of Delivery at West Point (in percentages). Source: Juhary (2007)

Modes/Likert Scale	Agree	Not Sure	Disagree	Total percent
Face-to-face	94	3	3	100
Written mode	81	10	9	100
Simulations	62	22	16	100
CD-ROM/Multimedia	32	27	41	100
e-Learning	27	32	41	100
On-line conferences	15	39	46	100

Second, despite the extensive electronic infrastructure at West Point and the widespread use of e-mail, the Internet and Intranet by cadets, academic and administrative staff, the cadets remained skeptical about the capacity of digital technologies to help with knowledge retention. They were also worried about the standards of online courses and whether their qualifications through these means would be recognised. The author interpreted these comments to reflect a degree of uncertainty, in the perception of cadets, about the commitment of West Point's management to digital teaching technologies. In other words, despite all the advantages of West Point, e-learning and simulations are clearly not a smoothly functioning operation. There was no capacity in this paper to explore this in detail; more extensive research is needed to document why West Point management is receiving this kind of implied criticism. Details on these issues are shown in Tables 3 and 4 below.

Table 3. The Percentages of Variable (Retain Knowledge Longer) for Courses in Electronic Forms - West Point. Source: Juhary (2007)

Variables/Likert Scale	Agree	Not Sure	Disagree	Total percent
Retain knowledge longer	29	41	30	100

Table 4. West Point's Cadets' Views about e-Learning and Simulation Issues (in percentages). Source: Juhary (2007)

Issues/Likert Scale	Agree	Not Sure	Disagree	Total percent
Worried about standard of qualifications with e-learning and simulation	72	20	8	100
Worried that e-learning and simulation will not be recognised	64	25	11	100

The third major conclusion to emerge from this comparative study is that the military cadets at the NDUM had a much more positive view of the potential of e-learning and simulations than their West Point counterparts. They too embraced the need for face-to-face contact in classrooms but they had a stronger attachment to the delivery of lessons through mixed modes that included digital means (see Table 5). These positive attitudes, paradoxically, arose in an environment in which (only with one exception – refer to the first part of this paper) there are no e-learning or simulations of any kind and where the Malaysian cadets do not even possess student e-mail addresses. This suggests that, contrary to the view that

these students are passive recipients of whatever is given to them, they are thinking of alternative ways of learning.

Table 5. The Preferred Mode for Learning at the NDUM (in percentages). Source: Juhary (2007)

Modes/Likert Scale	Agree	Not Sure	Disagree	Total percent
Face-to-face	81	13	6	100
Simulations	80	17	3	100
CD-ROM/Multimedia	75	20	5	100
Written mode	75	16	9	100
e-Learning	59	33	8	100
On-line conferences	51	38	11	100

The one exception that the author stressed in an earlier section is that of the Maritime Technology Programme, which involves a total of some 480 students out of the NDUM's total population of about 2,300. The Maritime Technology Programme, for reasons explained earlier, utilises simulation teaching techniques in order to train officers to navigate Malaysian ships through international waters. The author concluded as a result of her observations that the Maritime Technology Programme provides the NDUM with an internal role model of the kind of things might be achieved using digital teaching technologies if these were applied more broadly.

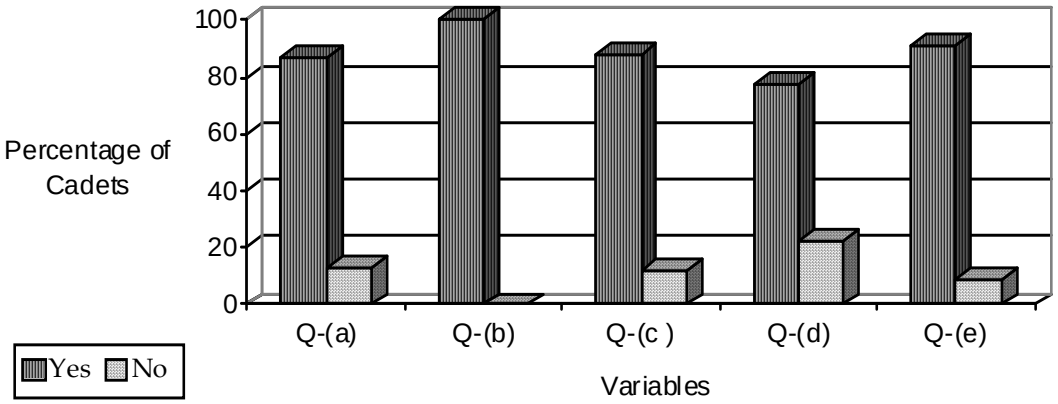
Related to this last observation, the author argues that it is significant that Figure 1 also suggested that Malaysian cadets were much more willing to step outside the didactic and authoritarian learning modes than has previously been thought. There does appear to exist a latent desire on their part to become more active participants in their own education. Reforming the NDUM, therefore, falls at the feet of senior management and the MAF. In matters of teaching technology, it is the top leadership that needs to move in the direction of change; the success of incorporating new technologies into the academic programmes at West Point was the result of strong commitment by the top management (eight out of a total of 11 interview respondents at West Point agreed to this). The cadets at the NDUM, it seems, are ready to respond.

The evidence in this study suggests that the NDUM has much to learn from West Point, but the *critical* lesson does not lie in the digital technologies that West Point uses. Rather West Point provides an example of an elite military academy built on, amongst others, the highest standards of academic merit. Digital technologies to be found at West Point therefore only constitute the latest technological change which West Point has absorbed – much in the same way that it has absorbed other technologies in the past.

All these factors suggest that the original hypothesis must be modified since it is evident that West Point does not rely *mainly* on digital technologies for encouraging West Point cadets to excel in academic performance. Rather, the West Point example argues for:

a) a combination of learning principles arising from behaviourism mixed with a massive dose of constructivist ideas – in the West Point case, this mixture is expressed through the Thayer System;

b) a firm commitment to face-to-face classroom learning situations in which digital technologies sometimes play a role – although digital technologies appear to be far more important outside the classrooms.



a) Do you want to have some control over your learning process?
b) Should you be active participants in your learning process?
c) Do you prefer active learning to rote learning experiences?
d) Do you prefer group discussions to lectures?
e) Do active learning experiences enhance learning?

Figure 1. Indicators for Being Active Participants at the NDUM (in percentages). Source: Juhary (2007)

As noted before, these differences are not based on the extent to which e-learning and simulation strategies are employed. The learning environments of the two military establishments are fundamentally different in the numerous ways summarised in this paper. The authoritarian ways of managing the country should not be allowed to prevent the NDUM from trying a different approach in the interests of giving Malaysia a more imaginative officer corps. This study proposes that in facing the security challenges of the 21st century, the MAF has no choice but to improve its capability and that of the elite defence university that supplies its leadership.

Conclusion

This paper has offered some insights into how to create a new learning environment at the NDUM, which includes the establishment of educational philosophies, student-sensitive teachers, classrooms that promote intellectual interactions and ways of bringing the professional objectives of the NDUM in line with the needs of the MAF. Despite this, much research still remains to be undertaken in particular at the higher levels of study in West Point and the NDUM. Specific texts and courseware also need to be analysed to assess their capacity to respond to the needs of student-centred intellectual learning. As noted before, the author was not given permission to access this kind of data.

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