

RESEARCH ARTICLE

The Need for Progress in an Era of Transformation: South African Professional Military Education and Military Effectiveness

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The article explores the link between defence sector reform, military effectiveness, and education. During the post-1994 transition, defence sector reform in South Africa primarily involved the ‘transformation’ of the South African National Defence Force (SANDF). The transformation of the military, though, was predominantly driven by the notion of racial representation with little emphasis on embedding military effectiveness as a central element of the transformation effort. While, education was recognised as a key element in the transformation of the military, the emphasis was on the programmes of the National War and Defence Colleges in Pretoria, targeting senior military officers. However, the accreditation of these institutional programmes through alignment with civilian universities was problematic and has forced the military to critically evaluate the pathway for the development of its officer corps. The evolving approach of the SANDF towards military education provides a useful case study to highlight the importance of a long-term view of military effectiveness, underpinned by a committed and educated officer corps, as a central component of defence reform initiatives.

Introduction

Defence sector reform, according to the United Nations policy on the topic, describes a national process that intends “to reconcile, reform, transform, restructure, reengineer [sic], enhance or develop an effective, efficient, accountable and affordable defence” (UN 2011:16). The defence sector is defined in an inclusive manner as “the civil-military structures, and personnel responsible for the protection of the sovereignty of a State

and its peoples while meeting the State’s obligations to contribute to international peace and security” (UN 2011:16). These civil-military structures include, amongst others, those responsible for education and research in civil society. As a process that is characterised by multidimensional and multi-layered complexity, defence sector reform, is highly dependable on education as a process and a tool to reconcile, reform, transform, restructure, reengineer, enhance or develop an effective, efficient, accountable and affordable defence. Since 1994, the process of defence sector reform in South Africa was discussed and operationalised under the notion of the transformation of the South African National Defence Force (SANDF) and the Secretariat of Defence.

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The overarching challenge of transforming defence policy and the armed forces in the context of the Constitution, the national security and economic realities of the country, and international law on armed conflict, is addressed in the first chapter of the first White Paper on Defence published in a democratic South Africa in 1996. The need for transformation is defined in terms of: the history of the armed forces in South Africa; the changing strategic environment at the international, regional and domestic levels; and, most importantly, the advent of democracy. The process of transformation, it is noted, will be guided by the principle of defence in a democracy (DOD 1996). As a result, the word transformation appears 75 times in the 1998 Defence Review.

Approach and Methodology

The aim of this article is to contextualise the utility of higher education in the SANDF since democratisation in 1994 with specific reference to the National War and Defence Colleges in Pretoria.¹ The first part of the article considers the importance of the interplay between transformation, education and the idea of military effectiveness. The second section demarcates the need for education in the SANDF, and the third part considers the ability of other educational institutions to address this need. The last part of the article highlights challenges facing the education of the military in South Africa.

The research question informing this discussion concerns the key factors constraining the delivery of higher education at the war and defence colleges of the SANDF. From a methodological perspective, the first part of the article relies on secondary sources and a literature review. The second part of the article is based primarily on the observations of the authors in the design and delivery of programmes at the war and defence colleges of the SANDF. As a result, some may consider the discussion to be somewhat anecdotal. However, the authors supplemented their views with informal and confidential interviews with other professionals involved in programme delivery at

the war and defence colleges. The authors would like to thank those involved in these informal interviews for their reading and constructive feedback on earlier drafts of this article.

A Word on Military Transformation, Effectiveness, and Education

Much has been written about the need for, and the drivers and impact of, transformation in the South African armed forces after democratisation in 1994 (Heinecken 1998; Kahn & Louw 2013; Uys 1997; Winkates 2000). From a practical perspective, some academics view South African armed forces as suffering from transformation fatigue (Cilliers 1998). More specifically, however, the armed forces face military effectiveness challenges because of how the transformation processes have unfolded over the last 20 years.² The process of transformation has had many important dimensions. The initial debate that unfolded was about the appropriate role and nature of the military within a democratised South Africa (Williams 2002). This issue became one of the cornerstones of the 1996 White Paper on Defence (DOD 1996) and the subsequent Defence Review published in 1998. With the 1998 *Defence in a Democracy*, higher education was positioned as an important mechanism to facilitate transformation and address the issue of military effectiveness (Department of Defence 2015: Chapter 11).

Despite the early good intentions and the early successes of the integration process, the SANDF and defence establishment in South Africa soon had to confront the controversy of the so-called Strategic Defence Package – a controversial arms deal undertaken by the South African government. Tainted by questions of corruption, the arms deal has become a primary focal point in post-apartheid corruption scandals and has led to questions about the alignment of the newly procured equipment with the operational needs of the SANDF (Department of Justice and Constitutional Development 2016). The defence package focused primarily on modernising the air capacity of the Air

Force and the surface ships and submarines to the Navy. In contrast, the security debate of the 1990s, with human security as the primary construct, informed future visions for the South African armed forces that placed a high priority on involvement in peacekeeping efforts in Africa (Ferreira & Henk 2009). Such efforts would not only be expeditionary in nature, depending primarily on the Army, but would have to rely heavily on the Air Force to provide tactical and strategic airlift.

The most important outcome of the arms deal, however, was not the misalignment between missions and capabilities within the military. The most important outcome was in the unfolding of a growing civil-military gap, with the public increasingly mistrusting the military, and both the public and National Treasury becoming very sceptical about the need for an expanding defence budget (Heineken 2005). Domestically, the military's image was tarnished, and its budget was under pressure. Practically, deployments into Africa, kept the SANDF out of the public eye. However, most media reporting on military affairs seemed to be negative. As a result, the debate on and focus of military transformation in South Africa became institutionally-driven efforts focusing on racial representation. It is interesting, for example, to observe how the military reports to the parliamentary Portfolio Committee on Defence during the 2000s focused almost exclusively on personnel racial representation percentages (Parth & Schneide 2017; Piombo 2012). As a result, by 2006, the demographic and cultural transformation goals, as outlined in the 1998 Defence Review, had largely been achieved. However, the transformation of the military in terms its professionalism and effectiveness goals have been less successful. Not only has the utilisation and implementation of higher education to enhance military effectiveness, remained largely unrealised, more specifically, it has become a major challenge.

The internal emphasis on demographics, instead of military effectiveness and institutional culture, as the primary driver of defence transformation, was increasingly reflected in

the challenges facing South Africa in peace mission deployments in Africa (see Mandrup 2008). Through its involvement in peacekeeping, the SANDF became an important element of South Africa's foreign policy. However, it soon became clear that the South African armed forces face a variety of disciplinary and other challenges in conducting and sustaining these missions (Anon 2001; De Carvalho and Nganje 2016). The problems facing the South African military in the projection of force in peace missions in Africa culminated with the disastrous 'Battle of Bangui' that left 15 South African soldiers dead after a two-day battle with rebels in the Central African Republic.

Various critical vulnerabilities affecting the effectiveness of the South African armed forces were exposed in Bangui. These included, amongst others, the lack of a strategic airlift capacity, inadequate command and control, and a lack of logistical, medical, air and intelligence support. Two observations can be made about the impact and aftermath of the Battle of Bangui (Vrey and Esterhuysen 2016): the first is the lack of public interest in what the South African military is doing in Africa. There was no real outcry from the public about the death of its soldiers in a mission for which the government could not provide a legitimate explanation without generating speculation and media attention about the personal economic interests of the South African President and his associates (Mandrup 2016). The second is the culture of denial and abjuration that became visible within the SANDF and the unwillingness of the SANDF to do an open, transparent and thorough in-depth after-action analysis of events in the CAR and to engage in open and transparent debate with academia and broader society about what transpired and what went wrong.³

If military effectiveness was only based on the results and outcomes of combat, the challenges would be relatively easy to solve through training. Training is a group-driven activity that develops the leadership and sociological factors of effectiveness – cohesion, group solidarity, small-unit

leadership, *Kameradschaft* – and non-material factors such as *esprit de corps*, staying power, and will-to-fight. The emphasis is on doctrines and tactical and weapon systems and their proper utilisation on the battlefield (Millett, Murray and Watman 1988:1–2). Training is a key element of the answer to the complexity of organisational effectiveness within the military context. However, the integration, skill, quality and responsiveness of both the vertical and horizontal dimensions of military institutions are the essence of many of the numerous, simultaneous, and interdependent tasks that armed forces must do at different levels of military effectiveness to perform with proficiency.

Education, and the theoretical foundation thereof, underpins military effectiveness in two fundamental ways. Firstly, education is *explanatory* in that it contributes towards increased knowledge and understanding of war and warfare. However, war is a practical business. Therefore, education is, secondly, *normative* since it constitutes guidance as to how war should be waged and won. Thus, education addresses military effectiveness from both a theoretical and practical perspective (Angstrom and Widen 2015; Van Creveld 2017). Writing on the utility of theory, Carl Von Clausewitz has profound insight that can be applied to the utility of higher education: education can “cast a steady light on all phenomena so that we can more easily recognise and eliminate the weeds that always spring from ignorance; it should show how one thing is related to another, and keep the important and the unimportant separate. [Education] cannot equip the mind with formulas for solving problems, nor can it mark the path on which the sole solution is supposed to lie by planting a hedge of principles on either side. But it can give the mind insight into the great mass of phenomena and their relationships, then leave [the mind] free to rise into the higher realms of action” (Clausewitz 1976:578).

The practical challenge – and reality of higher education that confronted the SANDF – is that, though soldiers have a

natural inclination to training, the military cannot educate on its own. Military education must be done in co-operation with the general, non-military, scholarly community; especially, in cases such as the SANDF, where an in-house higher educational capacity has not been developed over time. Two factors then come into play and have a direct impact on decision-making about education in the SANDF: firstly, the military must relinquish some control of the education process to academics; and, secondly, education is not only inherently expensive, but also naturally discriminatory in terms of access, exit criteria and requirements. These two critical factors underpinned many of the key challenges confronting the SANDF in its search for pathways to educate its personnel, particularly its officer corps.

The Demand: Drivers of the Educational Needs in the South African Military

Two factors shaped the debate on the role of higher education in the development of the SANDF in the post-1994 period: firstly, the focus was primarily on the role of the Military Academy and the Faculty of Military Science of Stellenbosch University in Saldanha Bay, Western Cape; and, secondly, that the military provided nominal and inapt input into the debate. The debate was primarily informed by the views and opinions of the academics at the Military Academy, the management cadre of Stellenbosch University, and academics and think-tanks from outside the military domain (Esterhuysen 2007: 229). The Institute of Defence Policy, now the Institute for Security Studies, played a key role in the unfolding of the debate. The debate, to a large extent, culminated in a 1995 conference on military education at the Military Academy in Saldanha and the publication shortly thereafter of the 1996 White Paper on Defence.

The 1996 White Paper on Defence addressed training and education as part of a chapter on civil-military relations. The positioning is insightful and a reflection of

how the authors of the document viewed the role of education in the armed forces. The White Paper does not clearly distinguish between education and training and treat them, essentially, as a singular entity. As such, education (and training) are seen, firstly, as essential “in developing the political and ethical dimensions of military professionalism” (DOD 1996), and secondly, education must play a key role in the “implementation of a civic education programme on ‘defence in a democracy’ to instil respect amongst military personnel and other members of the DOD for the core values of a democratic South Africa” (DOD 1996). The idea of ‘defence in a democracy’ is seen as a key element in “reorientating [sic] tertiary level education and the Military Academy” (DOD 1996: par. 38). The Military Academy is the only training and educational institution that is mentioned by name in the document.

In the late 1990s and early 2000s, the debate on education within the SANDF not only turned inwards, but it also shifted towards the role of the two senior learning institutions in the development of higher-ranking officers. Though the Military Academy in Saldanha remained the key role player in the delivery of a broad liberal education to entry level young officers of the SANDF, the National Defence College and the newly created National War College, both in Pretoria, came to be the cornerstone institutions for education in the SANDF and for the preparation of its senior leadership cadre. The War College came into being to address the need for jointness in the SANDF and the need to develop operational commanders for campaign planning and orchestration. The War College, with its emphasis on the operational level of war, found itself on the interesting borderline between training and education. It became the quintessential institution for qualifying military practitioners for promotion to colonel. The Defence College, in contrast, developed its so-called Executive National Security Programme (ENSP) as a truly educational programme with the idea of human security as

the primary design concept. It was designed for attendance by senior colonels for promotion to general rank.

It will not be wrong to argue that the ENSP at the Defence College was an outstanding, highly regarded and well-respected programme. It relied on systems thinking as the basis for the analysis of South African and global security. The directing staff at the Defence College played a key role in organising a wide range of national and international experts from both the academic fraternity and broader South African society as guest speakers. The extensive and highly impressive guest speaker programme was supplemented with visits to and briefings by a range of institutions in South Africa and abroad. The programme was aligned with the strategic needs of the SANDF and the country. The SANDF, often through the directing staff at the Defence College, had direct control over the presentation of the programme and, specifically, who attended and what was presented. The programme was well-attended by members from the defence industry, related security sector institutions like the police, intelligence and prison services, as well as senior foreign military personnel.

The programme, however, had two key challenges. Firstly, by placing the emphasis on security, in general, and human security, particularly, as the design concept for the ENSP, a gap was created in the education, training and development process of senior officers in the SANDF. From the War College with its emphasis on campaign planning and the operational level of war, the emphasis shifted to national and human security at the Defence College. From a scholarly perspective, it is possible to argue that the SANDF shifted the focus from military studies at the War College to security studies at the Defence College. In the process, defence and strategic studies were written out of the curriculum of the SANDF’s senior officer corps development. Thus, the notions of *defence*, *strategy* and *war*, disappeared from the educational curriculum of the SANDF;

there was no defence in the programme at the Defence College! Over time the inability of officers in the SANDF to think strategically and analytically about defence and war – not security – became quite noticeable.

Four key arguments underpin the necessity to maintain a focus on strategic and defence studies in times of peace (Betts 1997:7–9). Firstly, militaries obviously ought to have the expertise in case conflict arises. Secondly, defence and strategic studies ought to inform debates about the role of military power in situations where less vital interests are being threatened. In other words, defence and strategic knowledge is required for informed debates about the secondary role of the armed forces and their employment in situations short of war. The need for an informed debate about the employment of the SANDF in peace missions, border protection, environmental security and the fight against crime are the essence of this argument; the debate, however, declined because of the loss of knowledge on these issues within South African defence establishment. Thirdly, defence and strategic studies ought to ensure political and military logic in the debate about the defence budget. This became a critical matter in the debate about defence in South Africa with the SANDF increasingly at a loss to explain their motivations and contextualisation of the defence budget (Martin 2017a and 2017b). Lastly, and this is a vital issue for the post-1994 democratic South African society, a debate on defence and strategic issues are critical for civil-military relations. The elite in South African society increasingly distance themselves from the military. Few politicians and policy-makers have experience in military service and the increased professionalisation of the armed forces has underpinned their growth and development apart from society. The civil-military gap in South Africa became an interesting point of discussion amongst defence academics with many South Africans instead opting to serve in foreign armed forces like Britain and Australia.

Secondly, another key challenge of the ENSP, and eventually the key reason why the Defence College opted to terminate the ENSP,

is that the programme was not accredited at the South African Qualifications Authority (SAQA) and the Higher Education Quality Committee (HEQC).⁴ Although the ENSP was an outstanding and well-regarded programme that was strategically aligned with the needs of the SANDF and the nature of its personnel, accreditation was the one criteria that it did not adhere to; the one box that it could not tick. Accreditation was so important for the SANDF that it decided to terminate the programme and rather entered negotiations with universities in South Africa to present the programme through an accredited higher education institution.

Ultimately, there were many factors, outside of the focus and the accreditation of the ENSP, that contributed to the decision to terminate the programme. Firstly, it is important to view the drive towards accredited military education in South Africa against the background of the increased bureaucratisation and massification of both the military profession and higher education occurring in the world and, particularly, in Africa (MacGregor 2017). The global trends towards bureaucratisation and technocratic management of armed forces, led to an exponential growth in military middle management and a substantial increase in the number of staff colleges and institutions of higher military training and education.⁵ These realities were augmented more recently with a significant increase in the complexity of the operational domain – from the battlespace to military institutions and adversarial actors (Flowers 2004; Liddy 2004). This growth in the complexity of military institutions and the environment they are deploying into is increasingly driving the need for knowledge and the search for attributes associated with higher education. These realities were augmented in the SANDF with the need for transformation. However, the efficacy of the SANDF's efforts were questionable as the attendance of courses was not necessarily linked to a specific career path or an up-or-out principle in the management of personnel. As a result, there was no clear

criteria for meritocratic access to specific senior courses.

Secondly, since 1994 South African military personnel have been exposed to a wide variety of foreign professional military educational institutions – from peer institutions in many African countries to those of India, China, Britain, and even Germany and the United States. Of course, some of these institutions are notorious for handing out certificates as diplomatic tokens. However, this does not detract from the fact that, in many cases, South African military personnel who attended these foreign learning opportunities, returned to South Africa with a formal academic qualification – often a Master's degree in defence or security studies. This raises legitimate questions about why this cannot be done at the South African professional military educational institutions.

Thirdly, the 2015 Defence Review is quite explicit about the need for accredited military education at the SANDF's colleges. It states bluntly that all military learning activities “will be accredited within the NQF [National Qualifications Framework] and adhere to the requirements of the South African Qualifications Authority (SAQA)” (Department of Defence and Military Veterans 2015). In addition, it is noted, the SANDF must “partner its military professional education with existing programmes at universities and other institutions of higher learning and ensure accreditation of its own training programmes” (Department of Defence and Military Veterans 2015). The Defence Review also requires the SANDF to ensure “an appropriate balance between an in-house training capacity and the outsourcing of education to institutions of higher learning”. Thus, the Defence Review gives recognition to the fact that the SANDF can train on its own but needs outside assistance in the provision of education. The need for partnerships with recognised institutions of higher learning for quality education is thus recognised (Department of Defence and Military Veterans 2015). The Defence Review is also prescriptive in terms of the different levels of education and training

in the SANDF. This ought to begin with the Officer Foundational Education and Training that “will be founded in a broad-liberal education at the Defence Academy and the subsequent education, training and development programmes within the Defence Force” (Department of Defence and Military Veterans 2015:X). Thus, from a policy perspective the need is recognised for a first degree as requirement for entry into the officer corps. Of course, the practical reality is often far removed from this policy imperative. The next level is Junior Command, Warfare and Staff Course that ought to be presented by the different service colleges, followed by the Senior Command, Warfare and Staff Course at the War College and culminating at the so-called Joint Strategic Studies Course at the Defence College (Department of Defence and Military Veterans 2015).

Lastly, from a subjective perspective, and something that transpired through the negotiation process with the Faculty of Military Science and the Defence College, was the unspoken need for status, ticket punching and bragging rights. Very often it seems as if neither the process of education, nor the content and outcomes thereof, are necessarily of extreme importance to the SANDF. Rather, the emphasis on the need for education is, firstly, on the requirement for access for as wide a spectrum of students as possible to the educational programme, irrespective of whether a student has a first degree or not. Stated differently, the SANDF is not necessarily comfortable with academic gatekeeping. As is the case to some extent in South African society at large, there is little understanding for the somewhat elitist nature of academic institutions and the inherent discrimination against those without the aptitude for higher education (see Deresiewicz 2008). Secondly, the emphasis on the need for education is on throughput – those who enter must graduate. This is an inherent military mentality; higher headquarters expect high pass rates. Students are expected to “train” until they adhere to the required standard. In the end, the primary driver in the need for education seems to be the status that is associated

with an advanced degree and not necessarily the knowledge gained nor the attributes and advantages that an educated personnel corps would bring to the military. There is no doubt that the SANDF wants its personnel to be educated. Yet, the SANDF is not necessarily comfortable or prepared for the demands and kind of attributes, advantages and benefits that educated individuals would bring to the institution.

The Supply: Military Research and Education at South African Universities

Much of the above discussion has focused on the growth in the *demand* for education from within the South African armed forces since 1994. But, it is necessary to also look at the so-called *supply* side, specifically, the ability of the South African universities and other educational institutions to assist the South African armed forces in its growing demand for education. One of the basic assumptions in the discussion of military education is rooted in an understanding that international relations (IR), security or – more specifically – strategic studies, and military history are the cornerstone disciplines in the education of armed forces (Infinity Journal 2016). International relations, and the grey areas between international relations, African Studies and security in South Africa, are vibrant sub-disciplines and fields of study in most political science departments at South African universities. Most of these universities can provide IR education to the military educational institutions.

Research on South African military history is done by a number of academics at various universities in South Africa⁶ and a small number of scholars abroad.⁷ There is also a small number of independent researchers of military history in South Africa that have made substantial contributions to the historiography of South African wars over the years.⁸ The history of the Border War (1967–1989) specifically, have recently benefitted from a number of autobiographies from individuals who participated in that war. Looking at the history programmes on offer at South

African universities, however, it is interesting to note that military history does not constitute a key element of many of these programmes. A small number of universities address the causes, progress and impact of specific South African wars as part of the general history curriculum. However, it is not necessarily done against the background of a broad outline of the evolution of warfare. The Military History Department in the Faculty of Military Science of Stellenbosch University at the South African Military Academy is, thus, somewhat unique in their offering of a three-year programme in military history. Though the department addresses the military history of South Africa and Africa in general, the primary focus is on the evolution of warfare. The National War College also has one residential historian focusing on the links between the evolution of war, the notion of operational art and the operational level of war. What is evidenced is that while military history is vibrantly researched, military history is not readily on offer as part of the educational programmes at universities in South Africa. The military, to a large extent, must rely on the Faculty of Military Science of Stellenbosch University for a programme that has the evolution of warfare as its core focus.

Turning to strategic studies as an academic discipline, it appears to have been outmanoeuvred by the new and normatively-driven mainstream at civilian universities; in the policy field, the absence of good strategic thinking is becoming increasingly evident (Duyvesteyn and Worrall 2017). In South Africa, the study of strategy and research on military affairs must consider the impact of the broadening and deepening of the security debate and the impact thereof on South African universities and research institutions.⁹ Whereas South Africa experienced a vibrant interest in military affairs in the 1990s, it is clear that the study of the military, strategy and security in South Africa has been demilitarised with an emphasis on security, instead of strategic, studies. By way of example, since 1994 the Institute for

Defence Policy has been transformed into the Institute for Security Studies, the Department of Strategic Studies at the University of South Africa was absorbed into the Department of Political Sciences now only offering programmes in politics, African politics and international politics, and the Institute for Strategic Studies at the University of Pretoria has been recast into the Institute for Strategic and International Affairs with security as an elective in the programmes of the Department of Political Sciences. The Department of Political Sciences at Pretoria University still houses the *Strategic Review for South Africa*, a well-recognised journal in the field. However, the journal has broadened its scope in order “to facilitate more vigorous and enlightened debate among scholars, policy makers, practitioners, students and activists, to contribute to the wider global discourse on the strengthening of democracy, human rights, security, good governance and the rule of law” (University of Pretoria). It will not be wrong to argue that military and strategic studies, as an academic discipline, has been moved to the periphery of academic interest in South Africa, with a subsequent dwindling effect on the existing body of knowledge.

In an interesting chapter on insider-outsider experiences of military research in South Africa, Lindy Heinecken recently noted that “there has been a marked decline in the teaching on military issues in South Africa” with a shift from military and defence issues to broader human security issues and conflict resolution (2016:36). This, Heinecken points out, is due to “the historical and security context, as well as pressures stemming from broader society”; that this is an issue that is closely linked to the history of the fight against apartheid and the “strong anti-militarist sentiments among the English-speaking universities”; and that the small number of South African scholars that have maintained an interest in military affairs are scattered within South African universities with a broad research focus on issues of regional security, foreign relations and peacekeeping (Heinecken 2016:38–39).

Turning to the military environment itself, the South African military, before 1994, was strongly tactical and operational in orientation. A well-known South African defence commentator at the time, for example, argued that the SADF neither read nor wrote and “was suffering from mental stagnation” (Heitman 1980:48). Since 1994, very few officers have engaged in peer reviewed and accredited research. Heinecken notes that the South African armed forces still consider itself as “men of action” and that anti-intellectualism is prevalent (2016:40–41). Military libraries are totally under-resourced and lack the basic reading required for scholarly research and debate; there is little understanding and appreciation for academic research. A variety of factors make it challenging to engage in research in and about the South African armed forces. These include restrictions on access to information; centralised bureaucratic red tape; political sensitivities; and restrictions on publication.

These challenges have resulted in researchers relying on desk research and applying a degree of self-censorship, whilst teaching and research on strategic and military affairs in South Africa has increasingly become theoretical and detached from what is unfolding in practice (Heinecken 2016:42–43). Only two universities maintain a focus on teaching security, strategic and military affairs – the Gauteng-based University of the Witwatersrand and Stellenbosch University, through its Faculty of Military Science at the South African Military Academy.

The Centre of Defence and Security Management at the Wits School of Governance (WSG) has a one-year post-graduate diploma aimed at enhancing the knowledge and skills of current security sector administrators and practitioners. The programme targets individuals with work experience, who wish to embark on a career in the security sector, and equips them with the skills needed to become effective public administrators and security sector practitioners or enables them to proceed with a Master’s degree programme in the field. The

focus is on a sector-wide approach through a consideration of the role of institutions dealing with public safety, state security and defence. Two features of the programme ought to be emphasised. Firstly, it is quite clear that the programme is more oriented towards a wide and more comprehensive emphasis on the broad field of security than the narrower domain of defence, strategic and military studies (Centre of Defence and Security Management 2017). Secondly, the defining concept in the programme is *management* as not only reflected in the name of the programme but also that the programme is located within the domain of public management.

The Faculty of Military Science of Stellenbosch University, housed at the South African Military Academy, is an interesting and strange blend of a wide range of seemingly unrelated disciplines, some of which are difficult to link to the field of military science and strategic and military studies. More specifically, the emphasis in the programmes is on the provision of a broad liberal education and not necessarily a professional military education. The Faculty of Military Science offers students a wide variety of undergraduate degrees, Master of Military Science (MMil) and Doctor of Philosophy with specialisation in Military Science (PhD) programmes in (SU 2017):

- Human and organisational development.
- Organisation and resource management.
- Technology.
- Technology and defence management.
- Security and Africa studies

Two remarks must be made about the programmes of the Faculty of Military Science. Firstly, unlike the post-graduate diploma at the University of the Witwatersrand, the primary focus in the Faculty of Military Science is on undergraduate teaching. Only a small number of students enrol for the MMil and PhD programmes in the Faculty. Secondly, graduating with a BMil degree does not mean that a student has been introduced to security, strategic and military studies. In fact,

only a small number of students graduating with an undergraduate degree are exposed, in their three years of study, to the fields of military history, strategic studies and international politics. The Departments of Political Science, Strategy and Military History are grouped together in the School for Security and Africa Studies.

Facing Reality: Linking Universities with the Defence and War Colleges in South Africa

The increasing drive for higher education in the SANDF resulted in an agreement between the National Defence College in Pretoria and Stellenbosch University's Faculty of Military Science in 2014 for the delivery of a Master of Philosophy (MPhil) in Security Management at the Defence College. Consequently, in 2015, the ENSP at the Defence College was replaced by the Security and Defence Studies Programme (SDSP). The idea was that the MPhil in Security Management should constitute the academic component of the SDSP and that the Directing Staff of the Defence College (DS) should take care of the training elements of the programme.

The first challenge of the SDSP was that most of the learners on the programme did not qualify for entry into the MPhil in Security Management. Most of the officers in the SANDF do not have a first degree as it is not an enforced requirement for officership. Military personnel in the SANDF, in many cases even the same military rank, rarely have similar academic qualifications or experience, because career pathing is not aligned with qualifications in higher education. Thus, with the SDSP (as is the case with the rest of the organisation) many officers did not have the required academic foundation for master-level studies at Stellenbosch University. Additionally, many officers also did not necessarily major in security studies-related fields that allowed for easy access into graduate studies in the specific field. On their part, the SANDF further complicated the process by obligating some people to do the MPhil programme, regardless of personal motivation and previous educational qualification.

As a result, the first compromise of the SDSP was to present the programme through a parallel two-tier process: one small group of learners – those qualifying for registration for the MPhil in Security Management – was to graduate with both a master's level degree and a certificate from the College on completion of the SDSP; another larger group of learners, largely exposed to the same learning experience, was to be evaluated in a different manner, and was to graduate with two certificates: one from the Faculty of Military Science and one from the College.

Thus, alignment and access were problems from the beginning of the SDSP. One of the key issues was that an MPhil in Security Management is not aligned with the profile of a general in the armed forces. More specifically, the programme was not designed to serve as a graduate programme to prepare senior officers for high command. The SDSP was a compromise to provide a programme, in line with the Defence College curriculum, but registered, accredited and available for presentation. The SDSP was a means to an end – a way to deliver military education that also provided opportunity for accredited learning. While there were some attempts to design a programme more closely based on the skills requirements of a senior officer preparing to take high command, the SANDF has not given significant priority to and support for such efforts.

In addition, a more nuanced discussion on the requirements of military education must note that higher education does not always provide the knowledge and skill-sets that can be directly linked to everyday military tasks. Conversely, military training is always linked with practical everyday military tasks. As such, there is often a perceived misalignment between higher education and the practical needs of the military organisation. This perceived misalignment, however, is often based on the flawed notion that military training can be equated with academic education, or that the two have utility that can be substituted.

Time was another critical and contentious issue that the SDSP had to contend

with. The organisation has strict timelines about when a course starts and ends and what is to be achieved by every member of that course within a timeline, with the longest period normally being a year. Higher education, on the other hand, is based on individual performance and flexible timelines within the determined terminus of an academic programme. The flexible timeline allows for the individual to either complete within a minimum period, or a maximum period. However, the SANDF budgeting processes and work responsibilities of personnel do not always allow for this flexible timeline based on individual performance. Clashing with the organisation's notions of timelines, the accreditation of academic programmes rests on the availability of a prescribed number of notional hours. Presenting an MPhil programme in one year is a critical challenge if all the prescribed theoretical modules are to be covered and the thesis, that constitute a large part of the programme, is to be finished. As the military then add additional learning programmes to the existing schedule, time became a critical commodity. The result was that the thesis portion was postponed for completion by the candidates once they are finished with the SDSP at the College. This created two immediate challenges. Firstly, it set the scene for tension between the academics and the DS at the College for time with the students. Secondly, commitment was required from the students entering the MPhil in Security Management having to complete the thesis in the year after completion of the SDSP on their own time, while working. Of the small number of learners who qualified for entry into the MPhil in Security Management, an even smaller number eventually finished their thesis and received their degrees.

Time also revealed another challenge to the utilisation and implementation of higher education in the SANDF, and this relates to higher education versus military training. There is a misperception within the organisation, at the extreme, that military training alone is sufficient to command and manage the organisation. A more commonly held

misperception is that military training can substitute academic education. The reality is that although academic education and military training are not mutually exclusive, the two are unmistakably distinct, and one cannot substitute the other. Both are necessary for military effectiveness. The constraints of time, as aforementioned, pitted the dictates of military training, with the objectives of higher education. The requirements of higher education and the dictates of training, thus, must be both, aligned, and clearly demarcated.

Technology also presented a real challenge – especially since many of the evaluations were done through the *SUNLearn* web-based platform of the University. Students also had access to academic journals through the library website of the University. Though senior in rank, for many learners, it was the first time that they were required to participate in evaluations and research via a web-based system. The use of technology was encouraged by the Faculty, *inter alia*, because of the physical distance between the location of the Faculty of Military Science in Saldanha and the Defence College in Pretoria – a road distance of about 1500 km. This distance is not unique as training and education are provided in military units that are geographically removed from their higher education service providers. This presents various challenges, though, including higher costs and increased personnel requirements. There is, however, experience in interactive telematic education (ITE) where tuition can be provided in real-time, technologically-mediated contact modes to mitigate, and even remove, the impediments of geographical distance.

Geography also affected the relationship between the academics of the Faculty and the DS at the College. The role of the DS at the Defence College had to change, and this was accompanied by resistance and discomfort. Whereas the DS had full control over the content and presentation of the ENSP at the Defence College, they had to relinquish control of the academic component of the SDSP

to the Faculty. This was even more of a problem because, as was alluded to earlier, the MPhil in Security Management did not align seamlessly with what was previously presented as part of the ENSP. The DS at the colleges have military training expertise that are not always transferable in higher education, often setting them on a collision course with higher education service providers. In addition, the DS had to play a supporting role to academics that were often their juniors in terms of military rank. Instead of collegial relations developing between the DS and the academic, on some occasions, it turned adversarial. The military training expertise of the DS are, however, indispensable when linking the requirements of military training with the outcomes of higher education. Thus, the role of DS staff needs to be clearly defined, and they need to be capacitated to support higher education service providers, and to play the critical role of aligning the needs of military training and the outcomes of higher education.

Everyone that was involved in the project understood that this was a pilot project that would bring certain challenges to the fore and would require fine-tuning. However, towards the end of 2015, a decision was made to terminate the involvement of the Faculty of Military Science in the SDSP, and for the University of the Witwatersrand to deliver the SDSP. This was a surprise to the Faculty of Military Science and the members of the Faculty that were involved in the teaching at the Defence College. The decision to terminate the Faculty of Military Science's involvement at the Defence College was taken in haste; it was to a large extent based on personalised decision-making and it was not part of a bigger vision for higher education in the SANDF. Cultural clashes between the DS and academic staff, coupled with the inconvenient geography, strained inter-personal relations and undermined the initial effort. However, the Faculty of Military Science continues to be an important role player and by 2017 had been approached by the Defence College for renewed involvement in the

SDSP; the War College in Pretoria has also approached the Faculty for the presentation of Post Graduate Diploma in Defence Studies (PGDDS).

The decision to terminate the involvement of the Faculty of Military Science in the SDSP reveals the oscillation between personalised decision-making and collective decision-making that the SANDF experiences. On the one hand, collective decision-making leads to *group-think*, which stifles innovation and forward-thinking, and ends in self-deception. Challenges are glossed-over, and self-reflection is censored. On the other hand, personalised decision-making has detrimental results, including irrational decision-making. The end-result of both collective decision-making and personalised decision is that there is no unity of effort, and there is no maintenance of the aim. This lack of unity of effort and maintenance of the aim is evidenced, not only by the decision on the involvement of the Faculty of Military Science in the SDSP, and the oscillation regarding using one university to another as higher education services provides, but by other factors, including the lack of actionable and enforceable policy regarding mandatory higher education qualifications for different rank structures.

Lastly, the biggest challenge facing the implementation of higher education in the SANDF, and specifically at the War and Defence Colleges, is the disjuncture between expressed aspirations and the requisite inputs. There is some recognition within the SANDF that higher education makes an indispensable contribution to the effectiveness of such a complex organisation. However, this aspiration is not adequately resourced. This under-resourcing ranges from personnel requirements to funding, infrastructure and technology. The under-resourcing of the War and Defence Colleges has led them to rely on outside support from South African academic and civil society institutions as well as from the British military, who still maintain a training support presence at the peacekeeping training centre in Pretoria, and

other international partners. The Faculty of Military Science, for their part, have designed academic programmes for various institutions of the SANDF. Further undermining the education efforts, are that most personnel study part-time, and juggle professional and personal commitments with their studies. The military does not provide learners with adequate time and the requisite resources and support to enable part-time study for adult-learners.

Conclusions

The defence sector in South Africa has been radically reformed since democratisation in 1994. The transformation of the military relied heavily on racial representation as the key indicator of defence sector reform. Given the political changes in South Africa, the history of the armed forces, and the changes in the global and African strategic realities at the time, such an emphasis was expected and, indeed, necessary. However, the transformation process also impacted on the effectiveness of the armed forces. This situation was exacerbated by a substantial cut in the defence budget and a weapons procurement process that was not aligned with the strategic needs of the country and riddled by corruption. The result was a growing misalignment between missions and capabilities within the armed forces and the SANDF, as an institution, seen to be in a serious state of decline. The policy frameworks made provision for education to bring about transformation and addressed the issue of military effectiveness. However, that was easier said than done.

The debate on the role of education in the transformation and effectiveness of the armed forces was increasingly bureaucratized and focused on the role of the National Defence and the National War Colleges in Pretoria. The programmes at both institutions were critical in shaping the thinking of the future defence leadership as well as shaping the strategic narratives of the personnel in the SANDF and the strategic realities of the country. However, neither of the two

programmes were accredited with an institution of higher learning and participation could not be translated into an academic qualification on completion. This need for academic accreditation became a critical issue for the SANDF. Efforts to align the programmes of these institutions turned out to be more problematic than expected.

Part of the difficulty of alignment between the military and academic institutions had to do with the fact that security and, more specifically, strategic studies have become a marginalised discipline within the university sector in South Africa. However, the more critical issues seemed to be that defence personnel in South Africa are not required to have a first degree for entry into the officer corps and that the SANDF is not comfortable with the notion of gatekeeping by universities for entry into the graduate programmes. This is augmented by questions about the time balance between training and education, the control over the programmes, and the financing thereof.

Notes

- ¹ The notion of “higher education” is used in South Africa to describe tertiary education, in general, and at universities, in particular.
- ² The Minister of Defence and Military Veterans provides an overview of the challenges facing the military in her budget speeches. See the 2017 budget speech (Ministry of Defence and Military Veterans 2017).
- ³ This is in stark contrast, for example, with South Africa’s military intervention in Lesotho under the umbrella of SADC in September in 1998. In the case of Operation Boleas, Prof Theo Neethling from the Centre for Military Studies was tasked to do an in-depth analysis and after-action report of South Africa’s military involvement in Lesotho. See, for example, Neethling (1999).
- ⁴ See the following two documents for an outline of the accreditation of academic qualifications in South Africa: DoE 2008 and SAQA 2012.

⁵ See Van Creveld 1990 for an elaborate discussion of this phenomenon.

⁶ Profs Andre Wessels and Leopold Scholtz at the University of the Free State in Bloemfontein and Prof Fransjohan Pretorius and Dr Jackie Grobler at Pretoria University are the most prominent in this regard. One should also include the research of the Faculty of Military Science from Stellenbosch University in this regard. Prof Ian van der Waag’s seminal work *A Military History of Modern South Africa* ought to be mentioned.

⁷ These include, amongst others, Prof John Laband, Professor Emeritus at Wilfrid Laurier University, Waterloo, Ontario, Canada and Prof Tim Stapleton of the Department of History at the University of Calgary in Canada.

⁸ The names of people like Dr Louis Bothma and Piet Nortje should be mentioned in this regard.

⁹ For a more in-depth discussion in this regard see Esterhuysen (2016).

Competing Interests

The authors have no competing interests to declare.

References

- Angstrom, J** and **Widen, J J.** 2015. *Contemporary military theory: The dynamics of war*. London: Routledge.
- Anon.** 2001. SANDF ‘incapable of peace-keeping’. *Media24 Archive*, 27 January. Available at: <http://www.news24.com/SouthAfrica/SANDF-incapable-of-peace-keeping-20010127> [Last accessed 12 October 2017].
- Betts, R K.** 1997. Should strategic studies survive? *World Politics*, 50, October: 7–9. DOI: <https://doi.org/10.1017/S0043887100014702>
- Centre of Defence and Security Management.** 2017. *Research Entities*. Available at: <https://www.wits.ac.za/clm/research/research-entities/> [Last accessed 7 October 2017].
- Cilliers, J.** (ed.) 1998. *Continuity in change: The SA Army in transition*. ISS Monograph

- no 26, August. Available at: <https://issafrica.org/research/monographs/monograph-26-continuity-in-change-the-sa-army-in-transitionedited-by-jakkie-cilliers> [Last accessed 13 October 2017].
- Clausewitz, C.** 1976. *On war*. Howard, M and Paret, P. (eds. & transl.). Princeton, NJ: Princeton University Press.
- De Carvalho, G and Nganje, K.** 2016. South Africa's conflict prevention efforts must be more strategic. *ISS Today*, 14 November. Available at: <https://issafrica.org/iss-today/south-africas-conflict-prevention-efforts-must-be-more-strategic> [Last accessed 12 October 2017].
- Department of Defence.** 2015. *South African Defence Review 2015*. Available at: <http://www.dod.mil.za/documents/defencereview/Defence%20Review%202015.pdf> [Last accessed 4 October 2017].
- Department of Defence and Military Veterans.** 2015. *South African Defence Review 2015*. Available at: <http://www.dod.mil.za/documents/defencereview/Defence%20Review%202015.pdf> [Last accessed 6 October 2017].
- Department of Justice and Constitutional Development.** 2016. Commission of Inquiry into Allegations of Fraud, Corruption, Impropriety or Irregularities in the Strategic Defence Procurement Package. *Government Gazette*, 24 June. Available at: http://www.justice.gov.za/legislation/notices/2016/20160624-gg40088_gon742-ArmsCommReport.pdf [Last accessed 4 October 2017].
- Deresiewicz, W.** 2008. The disadvantages of an elite education. *The American Scholar*, Summer: Online. Available at: <https://theamericanscholar.org/the-disadvantages-of-an-elite-education/#.WeX5D1uCyos> [Last accessed 17 October 2017].
- DOD (Department of Defence).** 1996. *Defence in a democracy: White Paper on National Defence for the Republic of South Africa*, May. Available at: <http://www.dod.mil.za/documents/White-PaperonDef/whitepaper%20on%20defence1996.pdf> and South African Government, South African Defence Review, 1998. Available online at: <https://www.gov.za/documents/south-african-defence-review-1998> [Last accessed 4 October 2017].
- DoE (Department of Education).** 2008. *Classification of educational subject matter*. Available at: http://www.ch.ac.za/media_and_publications/accreditation-and-national-reviews/cesm-classification-educational-subject [Last accessed 23 October 2017].
- Duyvesteyn, I and Worrall, J E.** 2017. Global strategic studies: A manifesto. *Journal of Strategic Studies*, 40(3): 348. DOI: <https://doi.org/10.1080/01402390.2016.1269228>
- Esterhuysen, A J.** 2007. Professional military education in the South African National Defence Force: The role of the Military Academy. PhD dissertation, Stellenbosch University. Available at: <https://scholar.sun.ac.za/handle/10019.1/5691> [Last accessed 12 October 2017].
- Esterhuysen, A J.** 2016. Human security and the conceptualisation of South African defence: Time for a reappraisal. *Strategic Review for Southern Africa*, 38(1): 29–48.
- Ferreira, R and Henk, D.** 2009. 'Operationalizing' human security in South Africa. *Armed Forces and Society*, 35(3): 501–525. DOI: <https://doi.org/10.1177/0095327X08316148>
- Flowers, M.** 2004. Improving strategic leadership. *Military Review* March–April: 40–46.
- Heinecken, L.** 1998. The challenges of transformation: SANDF officers' attitudes towards integration, affirmative action, women in combat and language usage. *Scientia Militaria*, 28(2): 220–235.
- Heinecken, L.** 2005. Defence, democracy and South Africa's civil-military gap. *Scientia Militaria*, 33(1): 119–140. Available at: <http://scientiamilitaria.journals.ac.za/pub/article/view/6> [Last accessed 4 October 2017].
- Heinecken, L.** 2016. Reflections on insider-outsider experiences of military research in South Africa. In: Carreiras, H, Castro, C

- and Frederic, S. (eds.), *Researching the military*. London: Routledge, 36–48.
- Heitman, H.** 1980. Is the Army literate? *Scientia Militaria*, 10(1): 48.
- Infinity Journal.** 2016. *International relations in professional military education*. Special edition, January. Available at: https://www.infinityjournal.com/special-issue/23/international_relations_in_professional_military_education/ [Last accessed 10 October 2017].
- Kahn, S B and Louw, V N.** 2013. A leadership approach to the transformation of institutional culture: A case of the South African National Defence Force. *Administratio Publica*, 21(4): 67–90.
- Liddy, L.** 2004. The strategic corporal: Some requirements in training and education. *Australian Army Journal*, 2(2): 139–148.
- MacGregor, K.** 2017. The massification of higher education in South Africa. *University World News*, 00476, 6 October. Available at: <http://www.universityworldnews.com/article.php?story=2014062015083621> [Last accessed 6 October 2014].
- Mandrup, T.** 2008. The South African National Defence Force: Midwives of peace in Africa? An evaluation of SANDF involvement in peace support operations. In: Le Roux, L. (ed.), *South African Army Vision 2020, Volume 2: The South African Army relevant and ready for future security challenges in Africa*. Pretoria: Institute for Security Studies. pp. 97–126. Available at: <https://issafrica.s3.amazonaws.com/site/uploads/Book2010ArmyVision2020vol2.pdf> [Last accessed 4 October 2017].
- Mandrup, T.** 2016. Sorry Mr. Chairman, can we stop the meeting, we have a plane to catch: The South African entry into the peace support arena. *Paper presented at The Changing Character of Africa's Armed Forces*, Paris.
- Martin, G.** 2017a. Funding needed for Defence Review implementation. *defenceWeb*, 10 October. Available at: http://www.defenceweb.co.za/index.php?option=com_content&view=article&id=49526:funding-needed-for-defence-review-implementation&catid=111:sadefence&Itemid=242 [Last accessed 13 October 2017].
- Martin, G.** 2017b. South African defence needs to be prioritised. *defenceWeb*, 13 October. Available at: http://www.defenceweb.co.za/index.php?option=com_content&view=article&id=49579:south-african-defence-needs-to-be-prioritised&catid=7:Industry&Itemid=116 [Last accessed 13 October 2017].
- Millett, A R, Murray, W and Watman, K H.** 1988. The effectiveness of military organisations. In: Millett, A R and Murray, W. (eds.), *Military effectiveness: Volume 1 – The First World War*. Boston, MA: Unwin Hyman. pp. 1–30.
- Ministry of Defence and Military Veterans.** 2017. *Introduction of the debate on the Defence and Military Veterans budget vote 2017 in the National Assembly*, by Hon Nosiviwe Mapisa-Nqakula, RSA Minister for Defence and Military Veterans, 25 May 2017, *Parliament of the RSA, Cape Town*. Available at: <http://www.dod.mil.za/media/media2017/MODandMV%20BUDGET%20VOTE%20SPEECH%202017.pdf> [Last accessed 13 October 2017].
- Neethling, T.** 1999. Military intervention in Lesotho: Perspectives on Operation Boleas and Beyond. *The Online Journal of Peace and Conflict Resolution*, (2.2), May: Online. Available at: http://www.operationspaix.net/DATA/DOCUMENT/6107~v~Military_Intervention_in_Lesotho__Perspectives_on_Operation_Boleas_and_Beyond.pdf [Last accessed 18 September 2017].
- Parth, A and Schneide, S.** 2017. Civilian control and military effectiveness in South Africa and Ghana. In: Croissant, A and Kuehn, D. (eds.), *Reforming civil-military relations in new democracies: Democratic control and military effectiveness in comparative perspectives*. New York: Springer. pp. 103–128. DOI: https://doi.org/10.1007/978-3-319-53189-2_6

- Piombo, J.** 2012. Civil-military relations in an emerging democracy: South Africa. In: Thomas, C, Bruneau, T C and Matei, F C. (eds.), *The Routledge handbook of civil-military relations*. London: Routledge. pp. 255–276.
- SAQA (South African Qualifications Authority).** 2012. *Level descriptors for the South African National Qualifications Framework*. Available at: http://www.sqa.org.za/docs/misc/2012/level_descriptors.pdf [Last accessed 23 October 2017].
- SU (Stellenbosch University).** 2017. *Academic programme & faculty information*. Faculty of Military Science. Calendar Part 13.
- UN (United Nations).** 2011. *Policy: Defence Sector Reform*, 27 June. Department of Peacekeeping Operations, Department of Field Support. Available at: http://www.un.org/en/peacekeeping/documents/2011.17_Defence_Sector_Reform_Policy.pdf [Last accessed 24 October 2017].
- University of Pretoria.** n.d. *Strategic Review for Southern Africa: Announcement and call for papers*. Available at: <http://www.up.ac.za/en/political-sciences/article/19718/strategic-review-for-southern-africa> [Last accessed 7 Oct 2017].
- Uys, F.** 1997. The SANDF transformation process. *African Security Review*, 6(1): 58–63. DOI: <https://doi.org/10.1080/10246029.1997.9627697>
- Van Creveld, M.** 1990. *The training of officers: From military professionalism to irrelevance*. New York, NY: Free Press.
- Van Creveld, M.** 2017. *More on war*. Oxford: Oxford University Press.
- Vreij, F and Esterhuysen, A J.** 2016. South Africa and the search for strategic effect in the Central African Republic. *Scientia Militaria*, 44(2): 1–27.
- Williams, R.** 2002. Defence in a democracy: The South African Defence Review and the redefinition of the parameters of the national defence debate. In: Williams, R, Cawthra, G and Abrahams, D. (eds.), *Our-selves to know: Civil-military relations and defence transformation in southern Africa*. Pretoria: Institute of Security Studies. pp. 205–222.
- Winkates, J.** 2000. The transformation of the South African National Defence Force: A good beginning. *Armed Forces and Society*, 26(3): 451–472. DOI: <https://doi.org/10.1177/0095327X0002600306>

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