

## Evaluation report

Evaluated point	Grade	Comments
Scientific impact of research	Unsatisfactory	<p>Based on the updated publication statistics (provided by ENDC on May/June 2019), the total number of high impact publications (Estonian categories 1.1, 1.2, 2.1 and 3.1) is 135 in the years 2013-2017. This statistics shows slight increase in the average number publications per FTE from 1,15 in 2013 to 1,39 in 2017. When studying deeper, the number of publications in internationally ranked, peer reviewed publication fora was low (only 32 out of 135 publications). These included also some journals in Estonian language. Rest of the publications were divided into two categories: 57 publications in ENDC's own publication fora (especially Estonian Journal of Military Studies) and 46 publications in publication fora outside ENDC that either had no international ranking or ranking system did not categorize them as scientific publications. The average number of internationally categorized publications has been fluctuating between 0,23 and 0,38 publications per FTE in the years 2013-2017 what can be considered to be low internationally. These numbers would decrease even lower, if publications that are outside of the scope of the ENDC's research focus areas were excluded from the list.</p> <p>There are very few established researchers with a good publication record. The number of citations and the h-index of the researchers are generally low. Especially noted was that there were no publications in highly internationally and scientifically recognized journals. Attracting a small number of university professors in fields relevant to ENDC and provide them with a part-time contract at ENDC can stimulate the scientific impact and to rise ambition level of the publication fora.</p> <p>The first factor that seems to contribute highly to the limited number of publications is the lack of a clear publication strategy. This includes the level of ambition, the selection of target journals, and whether or not these journals should have a military focus or have a more general focus. In particular, Estonian Journal of Military Studies seemed to be a popular outlet. Estonian Defence Forces seems to emphasize Estonian language publishing which limits the international scientific impact.</p> <p>Secondly, several of the meetings showed that there was limited control nor steering based on the scientific impact. Researchers had almost entire freedom how much they published and in what type of journals. It remained unclear what norms applied to research and teaching staff regarding the number and level of publications. Partly as a result of that, researchers did not face any consequences in case they did not publish much or if they published only in the easiest alternative, ENDC's own EJMS.</p>

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		<p>Thirdly, the main objective in most of the research projects that were presented seemed to be to deliver a project report for the funding organization. Scientific articles were seen as a secondary output thereby getting less attention and time. This implies also that ENDC is not building knowledge based research.</p>
Sustainability and potential of research	Satisfactory	<p>The potential for development - hence, sustainability - has been recognised in the future plans, which will see the ENDC rebranded as the 'Estonian Military Academy' with a plan to increase co-operation and collaboration with external agencies. There should be potential for even greater ambition in this regard, with the EMA planning to be the lead, rather than a cooperating partner.</p> <p>Unfortunately, the research environment is still quite nascent. While the financial position is strong, and there is no reason to doubt that defence spending on R&amp;D is a firm commitment, currently the spend is directed by ENDC in an unfocused, project-based way, with no strategy for achieving critical mass in any particular area within ENDC. The support for research in the universities is undoubtedly of significant value to the universities and may, ultimately, provide the trained staff to populate ENDC with research leaders. Nevertheless, at the present time, there does not appear to be a strategy for seeding even one sustainable future research group with critical mass.</p> <p>The current research active staff in ENDC are engaged in relevant and important activities. However, not all of these activities meet the Frascati definition of research. Specifically, there are examples of excellent implementation of the findings of research conducted by others to the Estonian defence context, but this is not research. This is not to say that this work is not valuable or should not be done, just that it should not be confused with research. This confusion arises in part due to a lack of experience working within an established research culture. There is an agreement that "research is a good thing", even while there is less agreement about what it is.</p> <p>Despite of above listed critical comments, the panel found also some evidence of good sustainable research areas such as war and disaster medicine and the sociological surveys. Thus it is encouraged that ENDC should provide additional support in these areas to foster their growth and disseminate best practices.</p>

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		<p>Participation of staff in academic conferences such as Ergomas was frequently mentioned as well. Obviously, (paper) presentations at these conferences also contribute to the scientific impact. Further publication in scientific journals could be pursued after presenting draft research outcomes at such conferences to make stronger scientific impact.</p> <p>Researchers at ENDC do not seem to join the international, scientific community such as being member of editorial boards, research funding panels, and scientific networks.</p> <p>Finally, the PhD-students were successfully focused at writing journal articles. This is a valuable strategy. If ENDC staff is able to co-author some of these papers, this would benefit the scientific impact of ENDC and would support also sustainability.</p>
Societal importance of research	Satisfactory	<p>In the self-evaluation report (SER) and during the interviews, ENDC personnel expressed a clear view and understanding of its role in conducting research as part of EDF's and EMod's needs and working relation with the Estonian defence industry. In SER, ENDC pointed out several evidences that they claim for proof of highest societal impacts, such as monitoring various aspects of human resources of national defence; developing selection methods of future officers for EDF, providing development program for military leaders; contribution in capability development with partners; coordination of defence related research projects in Estonia; and developing of military terminology in Estonian language.</p> <p>ENDC has also specified positive societal impacts in research community including participation of international, non-academic networks, publishing an own military journal (EJMS) and developing joint doctoral programs with Estonian civilian universities. Also, developing situational awareness models is mentioned.</p> <p>Above mentioned activities can be also considered as societal impacts, however SER and the interviews demonstrated very little evidence of societal impacts as defined in the evaluation criteria section 5.3.</p> <p>There seem to be two clear reasons why ENDC lacks concerns on societal impacts of its R&amp;D. First of all, there is no demand from EDF nor EMod about this aspect. Second, ENDC has not internally set any objectives for researchers or research projects concerning the societal impacts. ENDC needs to define its objectives, key target audiences and channels to be used to achieve societal impact.</p> <p>ENDC is involved in activities that definitely have interest with general audience, such as investments in defence, willingness to defend the country, and the</p>

		role of conscript service. ENDC could use various channels, such as TV, radio interviews, social media, articles in newspapers, popular magazines, and public lectures (studia generalia). ENDC should have a crucial role in providing reliable information and expert analysis based in research results.
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<p>Scientific basis to conduct doctoral studies. (This question should be answered only if: a) institution being evaluated is conducting doctoral studies and; b) The field being evaluated is proposed to grant positive evaluation. If these conditions are met then: a) If the level of scientific basis is sufficient for conducting doctoral studies in every structural unit being evaluated, then the answer should be „yes“; b) If the scientific basis is not sufficient in some structural units, then those units should be listed.)</p>		<p>ENDC works closely with Estonian civilian universities in order to produce post-doctoral researchers in areas that are in interest of ENDC, EDF, and EMoD. There are several good reasons why this arrangement is beneficial for ENDC. First of all, those civilian universities have a long tradition of providing doctoral education and they have good quality control measures to ensure research quality. This is also an easy and rapid way to get more post-doctoral researchers for EDF and EMoD. However, from ENDC's point of view, this arrangement has limited value in developing ENDC's own capability to supervise doctoral studies and in creation of a stronger scientific research culture. Therefore, the evaluation board strongly encourages ENDC to invite those civilian universities' professors to work part time at ENDC in order to strengthen understanding of research methodologies, practices and quality control systems. Based on discussion with the doctoral students, the evaluation panel strongly recommends ENDC to take stronger control on the areas of doctoral students' research topics in order to create critical mass on selected focus areas. One should consider the possibility to specify one theme per year on which doctoral students should file their research proposals. The current operating model seems to allow doctoral candidates to select basically any research question that they self consider relevant. From the individual's point of view that is convenient, but from the research strategic level leads to an uncoordinated outcome. ENDC should implement (together with its civilian partners) a solid selection process for doctoral candidates that does evaluation of the candidates' capability of doing the proposed research as well as usefulness of the research from the perspective of ENDC, EDF and EMoD. ENDC with EDF should take a more proactive role in defining preferable research topics for doctoral students, especially for those who are selected to do the doctoral studies in partially or fully paid positions. Naturally, one should allow doctoral students' to specify research topics of their own but such topics should be considered more as personal development and interest rather than strategic interest of ENDC or EDF.</p>

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		<p>This proposed shift in operating principle would allow ENDC to set a long term goal to achieve the possibility to apply rights to award its own doctoral degree. This would require more focus in developing positive, scientific research environment in ENDC on the area of military science that is not just the graduated doctoral students but also competent supervisors, research community, working selection methods for doctoral candidates, appropriate quality control system and research systems such as for ethical scrutiny.</p> <p>Especially in operational art and tactics, civilian universities may not be capable of providing supervisors. ENDC should consider to do collaboration internationally with other military research organizations.</p>

## Summary assessment

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<p>Areas of special note as appropriate (Where necessary indicate sub-fields, assessment criteria, and/or structural units which, in the committee's opinion, were of a notably high level.)</p>		<p>The evaluation panel did see some evidence of strong research, albeit with small numbers of people involved in each. For example, there are interesting publications as well as planned and ongoing research projects in the area of war and critical care medicine that are of international quality. Another example of this is the work on 'military terminology' in communication: while presented in the very specific context of the Estonian military, the work clearly has implications for any communications in any environment where speed and precision of communications are critical. This too would be considered of international standard. These areas would seem to have the ability to attract international attention.</p> <p>As a second strong aspect, the relationship with EDF stands out. EDF steadily funds the great majority (74%) of the total research budget of ENDC. EDF is closely involved in prioritizing and selecting the research projects in ENDC. This ensures strong commitment of EDF as the end user of most research activities. There also seems to be a very strong commitment of the top leadership of EDF to stimulate research, however scientific research is not EDF's main objective but fulfilling capability gaps. Although there is a risk of decreased scientific independence of ENDC, its staff is very confident this is not the case. In their words, they are free to select the topics, apply the methodology they believe is most suitable and are free to publish results, also if these turn out to be less favorable to the EDF. Despite these positive experiences, the evaluation team recommends to record this procedure to ensure scientific independence in the future as well.</p> <p>A third positive aspect is the strong cooperative relationship between ENDC and several Estonian research centers and universities as well as the defence industry. Despite these strong relationships, ENDC sometimes seems to overlook its own interest and mostly pleases the interests of other stakeholders in terms of e.g. topic selection. Developing a clear research strategy should enable ENDC to promote its own long-term strategy in building critical mass in research. Cooperation with international universities and defence academia could also be further strengthened.</p>

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		<p>A fourth positive aspect is the mixture of civilian and military personnel within ENDC staff. The combination of both disciplines provides great opportunity to get the best of both worlds: the experience and practical knowledge of the military as well as the academic insights of the civilian staff. Quite frequent rotation of military personnel however creates a challenge for sustainability of knowledge amongst ENDC.</p> <p>Fifth, ENDC seems relatively well embedded in NATO research projects, most prominently SPS funded projects. ENDC staff participates in several research projects that enables them to cooperate with likeminded researchers on topics of common interest. In the future this should stimulate joint scientific publications even more.</p>
<p>Areas in need of improvement as appropriate (Where necessary indicate sub-fields of the field being evaluated, assessment criteria, and/or structural units which, in the committee's opinion, revealed significant shortcomings.)</p>		<p>The evaluation team strongly recommends ENDC to define a research strategy that is openly communicated to all parties involved. This strategy should cover all three areas that were under evaluation: research and its focus, sustainability of research, and societal impacts of research and researchers. Such a strategy and its implementation plan definitely helps researchers and the management to steer limited resources to the most crucial topics that serves not only ENDC, EDF and EMoD but the entire Estonian society.</p> <p>In the interviews, researchers expressed that they have strong independence of selecting their own research questions when the project was not part of the EDF's base line funding (74%) but from other sources covering roughly 26% of research resources. Although this 74% of the research questions are coming, more or less, as given from the EDF, ENDC's research strategy and its clarified role, on what are the objectives of ENDC's research helps to specify more accurately projects that are suitable for ENDC, that serves needs of EDF and MoD as well as ENDC's unique role in the Estonian society as the only educational and research oriented institution on the military science area.</p> <p>The self-evaluation acknowledges that human resources are stretched and this may be having a negative effect due to the lack of critical mass.</p>

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		<p>However, the extent to which the 'non-core research staff' are engaged in the research process is not clear. A stated aim in the development plan is to give methodological skill training to 80% of teaching staff and to have more than 75% engaged with the research. There does not seem to be an implementation plan for achieving this and no evidence of progress was presented. Not all personnel were aware of these objectives in the interviews.</p> <p>In the interviews, ENDC's slides emphasized that higher academic personnel has an obligation to participate in research, lecturers 600 hours and professors 810 hours per year. It was not, however, clear how these hours are planned to be used and whether all these hours are actually used in research, since an answer to a question "where the time for the societal impact is allocated?" was that it is part of the timeslot allocated for the research. ENDC has a structure that encourages lecturers and professors to participate research activities. This also should ensure knowledge flow from research to education as well as to improve connections between thesis topics of ENDC's students and research projects. At the moment only 1/3 of the thesis topics are related with research projects.</p> <p>ENDC needs to implement documented research and steering processes for research, including those for quality control, data control (open data), and ethical review (open access).</p>
Assessment proposal to the Minister of Education and Research	To grant negative evaluation	<p>Since we deemed the volume of quality research to be currently "unsatisfactory", our suggestion is to grant negative evaluation at this time.</p> <p>The evaluation committee found ENDC to be in a challenging position due to conflicting requirements. While on the one hand, publications in Estonian language is demanded to disseminate research findings and to participate societal discussion in Estonia. But on the other hand demands to establish university level research traditions and collaboration requires to participate actively in international scientific fora. Since ENDC is in a unique position in the Estonian education system having no other national institution with same area, the importance of international research collaboration is even more important than for the traditional civilian universities.</p>

		<p>If the scientific discussion of ENDC is mainly taken in place in Estonian language, this could limit constructive feedback from the scientific military community on the research results due to the language barrier. Thus one should reconsider requirements set for ENDC. ENDC should be directed to publish more research results in international scientific fora and this way to validate results by both military and civilian scientists and then disseminate research results and knowledge also to Estonian society and in Estonian language.</p>
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## Feedback

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<p>Feedback for institution (This question should be answered only if the institution asked for feedback from the evaluation committee in the self-report (about up to three specific areas of R&amp;D which it finds to be currently important, e.g., related to its development plan).)</p>		<p>Classification of military science among the research disciplines (Frascati):            With the exception of the agricultural sciences, most research that is being carried out at ENDC falls within Frascati categories. The panel thinks that in a multidisciplinary research environment, Frascati categorization is less relevant than coherence of research questions and knowledge base.</p> <p>Development of doctoral study program in military science in Estonia:            See above on the section "Scientific basis to conduct doctoral studies."</p> <p>Alternatives of publishing research results that are restricted/classified, but important from the perspective of capability development:            Being challenged by peer-review for journal publication ensures the appropriate dissemination of high quality research. In case of confidential research, internal peer review and successful implementation of research results fulfils the same function. Thus, the researcher should still get credit and rewards for high quality research.</p> <p>ENDC has access to a great amount of data (e.g. through the different surveys). This makes ENDC a preferred partner of several civilian universities and research institutes. Estonia's proximity to and knowledge of Russia could be beneficial as well to raise interest of foreign research partners that are focusing on topics like hybrid warfare, influencing operations and societal resilience.</p>
<p>Suggestions for unit, institution, state etc. (As appropriate, committee can give additional feedback for the structural unit, the institution, or the State (please specify whom feedback is directed to) according to the directive assessment criteria for regular evaluation (article 7).</p>		<p>See above comments for suggestions.</p>