



Stimulating medical education research in the Netherlands

DEBBIE JAARSMAN¹, ALBERT SCHERPBIER², CEES VAN DER VLEUTEN² & OLLE TEN CATE³

¹University of Amsterdam, the Netherlands, ²Maastricht University, the Netherlands, ³University Medical Center Utrecht, the Netherlands

Abstract

Background: Since the 1970s, the Dutch have been active innovators and researchers in the medical education domain. With regards to the quantity of publications in the medical education literature, the Netherlands rank second among countries in Europe and fourth worldwide over the past years, related to the journals with highest impact factors.

Aim: We attempted to analyse what made this country so productive by exploring the backgrounds of this success.

Method: An updated comparative evaluation was conducted. Nationalities of first and last authors were screened. And an indicator whether supervision is ‘exported’ or ‘imported’ was calculated.

Results: The Netherlands still rank high in number of publications and the production increases. In contrast to other countries, the Dutch are ‘exporting’ their supervision.

Conclusions: The opportunity to start a new, experimental medical school from scratch in Maastricht has undoubtedly contributed significantly to this national productivity. One other factor seems the establishment of the Netherlands Association for Medical Education with its mission to stimulate research and development of education. Annual conferences, Courses on research in medical education, Chairs in medical education qualified to graduate PhD students, and a general open and critical national culture of enquiry may have added to this success.

Introduction

Quality and quantity of research in the medical educational domain is important for two main reasons. It contributes to the building of a coherent body of knowledge and increases the understanding of learning processes in the medical domain. Next, it informs the decision making in medical educational practice (Mann et al. 2011).

An exceptionally rapid increase of publications on medical education issues can be observed in the past two decades. Until the 90s, two international journals (*Academic Medicine and Medical Education*) dominated the scene. In 2012, there are at least 21 general medical education journals, eight specialised education journals within the medical domain and eight national medical education journals. Most of these journals seem to observe increasing manuscript submissions. Journals with high impact are forced to decrease acceptance percentages or increase publications per year. Medical education journals see their impact factors increasing; two journals passed the 3.0 impact factor threshold in 2012. In addition, general medical journals, such as *BMJ* and *Journal of General Internal Medicine* now regularly include education papers.

Most of the publications stem from the USA, the UK and Canada. The Netherlands however, as a small country, has also significantly added to medical education literature. In a bibliographic study, the Netherlands ranked fifth of countries

Practice points

- The Netherlands have become known for productive medical education research and development.
- Bibliometric calculations show that Dutch medical schools rank world highest in RPP in medical educational domain.
- Explanations include an active national association for medical education, the appointment of professors in medical education qualified to graduate PhD students, a culture, generally supportive of change, and the close links between research and practice of medical education.

with the most publications in *Academic Medicine* and *Medical Education* between 1995 and 2000, behind the USA, the UK, Canada and Australia (Tutarel 2002). Even though the Dutch share was small, compared to other countries, it was certainly not trivial. In 2007, Ten Cate introduced a relative measure to correct for the number of schools, to provide an estimate that relates to the country's size (Ten Cate 2007). The relative publication productivity (RPP)¹ is the number of publications in a given period divided by the number of medical schools, in a given set of journals. The RPP across four journals with the highest impact factors in the medical educational domain over

Correspondence: D. Jaarsma, Academic Medical Centre, University of Amsterdam, Centre of Expertise in Medical Education, Meibergdreef 15, Amsterdam, Amsterdam 1105 AZ, the Netherlands. Tel: 0031(0)205661711; email: d.jaarsma@amc.nl

the calendar year of 2006 (*Medical Education, Academic Medicine, Advances in Health Sciences Education* and *Medical Teacher*), the Netherlands showed a score of 4.6, outperforming Canada (3.5), the UK (2.3), the US (2.1) and Australia (1.3) (data derived from (Ten Cate 2007)).

Recently a 10-year counting in five medical educational journals and five general medical journals was reported in which the Netherlands ranked fifth. The two most productive authors were Dutch (Doja et al. 2010). Rotgans (2011) also found that in the top 10 of most productive authors in medical education domain, four are Dutch, and in the top 10 of most cited authors, two are Dutch (Rotgans 2011).

The aim of this study is to update figures and further explore what makes the Netherlands successful in this field by reflecting on the possible factors contributing to this success.

Method

In January 2012, a new comparative evaluation was carried out. Four medical educational journals with the highest 2011 impact factors (*Medical Education* – IF 2.64, *Academic Medicine* – IF 2.63, *Medical Teacher* – IF 1.49, and *Advances in Health Sciences Education* – IF 1.41) were selected, and screened on the nationality of the first author and the nationality of the last author of all publications from 2006 through 2011.

In addition, we calculated a different coefficient, contrasting the number of publications with a first author from a country, usually the writer of the text and primary investigator, and the number of publications with a last author from that country, usually the supervisor of the project. We subtracted the first from the last to arrive at an indicator whether supervision is more often ‘exported’ (a positive number) or ‘imported’ (a negative number).

Results

Table 1 presents how again the Netherlands rank fourth worldwide in number of publications with a Dutch first author, and second among European countries. If the number of publications is related to the number of medical schools, the Netherlands outperforms all other countries, with an average of 5.0 publications per year per school. Canada ranks second with 4.1 per year per school, and then comes the UK (3.2), the USA (2.2) and Australia/New Zealand (1.5). Worldwide, all other 1965 medical schools have published 92.5 papers yearly

in this period in these journals, which means on average 0.05 papers per school. This amounts to approximately one such publication on average every 20 years.

The percentage of Dutch publications of all publications in these journals over this period (2006–2011) has been a stable 6–7%. However, during these years there has been a net increase of publications in these four journals with about 30%, which means that the Dutch production has increased in absolute sense.

In most publications, first and last authors come from the same country, and the expected outcome of this subtraction of all first from all last authors should thus be around zero. In some cases, however, the first and the last author may come from a different country. The last author is usually the senior supervisor of the study that is published (Drenth 1998; Baerlocher et al. 2007). For most countries this subtraction yields a negative score. This means that while most publications have first and last authors from the same country, some publications have a last author from a different country. Translated to supervision provided by the senior author, this would mean that most countries have more ‘import’ of supervision than ‘export’ of supervision. There is one exception: the Netherlands, showing a positive balance of supervision ‘export’ (Table 2).

Those who are acquainted with the medical education literature may readily acknowledge that Maastricht university has a dominant share in international collaborative research causing this finding (Rotgans 2011).

Discussion

The overall conclusion is that the Netherlands is highly productive in publishing in the medical educational domain. As a small country this is a remarkable accomplishment. It is interesting to speculate why and how this has come to be. What factors contribute to this success? We did not conduct a thorough investigation or analysis to do establish these factors, but write from the authors’ personal experiences and perceptions.

We identified several factors that could have caused enthusiasm to publish about medical education: the existence of an active national association or medical education, a national course on research in medical education as a primer for new researchers and scholars in this domain, the Chairs on education in the Dutch medical schools with a large number of associated PhD students, the establishment in 1991 of a

Table 1. Publications during the period of 2006–2011 according to the country of the first author.

Journals	NL	CA	UK	USA	AUS/NZ	Others	Total
Medical Education	97	141	251	207	75	141	912
Academic Medicine	12	101	19	1294	12	37	1475
Medical Teacher	93	120	299	198	75	314	1099
Advances in Health Sciences Education	37	61	34	79	25	63	299
Total	239	423	603	1778	187	555	3785
Mean per year	39.8	70.5	100.5	296.3	31.2	92.5	630.8
Percentage	6.3	11.2	15.9	47.0	4.9	14.7	100.0
Number of medical schools	8	17	31	136	21	1965	2178
RPP	5.0	4.1	3.2	2.2	1.5	0.0	0.3

Table 2. First and last authors of publications during 2006–2011 according to nationality.

	NL	CA	UK	US	AUS/NZ	Other
Publications with first author from this country	239	603	423	1778	187	555
Publications with last author from this country	265	456	373	1497	156	427
Difference	26	-147	-50	-281	-31	-128

national quality assurance system for higher education and perhaps simply a Dutch national culture of tolerance, non-conformism and initiative.

The Netherlands Association of Medical Education

One of the missions of the The Netherlands Association of Medical Education (NVMO) is to stimulate research in medical education (Ten Cate 2008). When the Association was founded in 1972, there was a lack of knowledge in this field, no research infrastructure existed and no urgency and interest was felt among medical schools to empirically found and justify their curricula, as teaching was mostly a matter of tradition. The Association has grown since then from less than a 100 members to approximately 1250 members in 2012. They come from a diversity of backgrounds, being educationalists, medical doctors, cognitive psychologists, veterinarians, nurses, medical students and others. All eight medical schools and the postgraduate medical training programmes are well represented.

The NVMO has established the first Dutch chair in medical education, in 1991, which had a strong catalytic effect on professionalisation of the field. Within two decades, all medical schools have established one or more chairs in medical education.

Since 1991, NVMO organises an annual conference on health care education. Each November, around 150 invited keynote lectures, paper presentations, posters, workshop, roundtable discussions, PhD thesis presentations and other communication methods are included in a two-day retreat, precede by a preconference day. Many contemporary issues relating to undergraduate, postgraduate and continuing education and the continuum across the different phases are discussed. The number of participants joining the conference has increased from about 100 in 1991 to about 900 in 2011. As Aviad Haramati, invited 2010 keynote speaker, said: 'That is about 100 participants per medical school; if we held such an education conference in the USA we would have approximately 14,500 people joining us'.

A second focus of the Association is a Dutch medical education journal, established in 1982. After a successful 30 years of existence, the number of submissions started to decrease, paradoxically. The supposed reason was an increased ambition of authors seeking international readers instead of Dutch. This led to the decision in 2011 to transform the Dutch Journal of Medical Education into the English language journal *Perspectives on Medical Education*, launched in 2012.

NVMO currently has 15 active Special Interest Groups (SIGs), many of which have published journal papers.

This article in fact stems from an agreement between *Medical Teacher* and NVMO to publish a paper with the NVMO logo twice a year, generated from one of the NVMO SIG.

It was in 2011 that a SIG on medical education research was installed, to specifically support the growing number of faculty who are willing to conduct research but who are not yet part of a research group. This SIG organises three-hour sessions on a variety of topics (e.g. research paradigms, scale construction, qualitative research methods and writing for publication). All sessions are held in Utrecht (central in the Netherlands) and are limited to 35 participants, who come from all over the country. The sessions are popular and mostly over-registered. This SIG does of course not explain the increased publication productivity in the past years, but will probably add to it in the future.

Since 2006, NVMO stimulates the networking among PhD students studying medical education topics. A 1-day PhD symposium is held each year. It is organised by and for PhD students and financially supported by NVMO. Around 50 PhD students attend this event each year.

Another research related initiative started by NVMO is the establishment of an Ethical Review Board for medical educational research (NVMO-ERB) to meet the need for an approval procedure of experimental research by an ethics committee that major medical education journals ask for nowadays. In the Netherlands there is no habit of reviewing education research, because existing medical ethics review boards have a limited legal obligation, confined to medical, patient-related research ethics. A framework for the ethical review of education research was developed that specifically takes into account the characteristics of medical education research (Ten Cate 2009; Eikelboom et al. 2012). NVMO-ERB has reviewed over 100 proposals in the first 2 years of its existence. Again, this activity cannot explain the Dutch research productivity, but it does illustrate the high commitment of NVMO to research of medical education.

A key strength of NVMO is the strong community and broad network that is being built, based on collaboration between research institutes and different researchers. The Netherlands is a small country with approximately 17 million inhabitants on less than 35,000 square km, so it is relatively easy for researchers to meet face-to-face, which we think helps tremendously to build solid relationships and the sharing of research.

A primer course on research in medical education

In 1996, the first 4-day course on Research in Medical Education was provided, as one module in a series of courses

on medical education, meant to obtain an education certificate. The course has welcomed over 200 participants between 1996 and 2012. The course sessions are spread over one year and participants supply actual research proposals to be discussed by expert leaders and peer participants in groups of about 10–12. The course aims to build a community and to share information, knowledge and experience. Basic statistics are explained and progress on each project is monitored and shared. At the end of the course, participants present the results of their studies. Between the group sessions, participants stay in touch and help each other and connect with the trainers who provide feedback on their work by email. The SIG on medical education research as described above was inspired by this course for its thematic topics.

Chairs in medical education and associated doctoral research projects

Since 1991, different Dutch medical schools appointed professors on chairs in medical education, inspired by the first chair established by the NVMO. Currently, all medical schools employ full professor chairs in medical education, often specified with a subdomain. The appointed professors have backgrounds in medicine, education or psychology or a specialised field, such as veterinary medicine. Medical schools are particularly motivated to establish these chairs to stimulate academic careers in education, to slightly match the large increase of research and clinical professorships. It also shows that an academic approach to education is taken seriously. The schools finance almost all chairs. This clearly illustrates their increased commitment to value education. The visibility of schools with such chairs leads other schools to establish them too. In the Netherlands, a professor position grants the legal right to supervise doctoral students to obtain a PhD degree and part of the university's government funding is based on the number of PhD graduations. This serves as an incentive to increase PhD awards. The past decade shows a marked increase of PhD graduations (Figure 1). The number of such graduations is a marker of the university's esteem. As doctoral theses are usually based on four to six articles in peer reviewed journals, the investment in chairs in medical education also leads to an increase of publications in the Netherlands. In addition, medical education research is increasingly embedded in group work, either related to a graduate school or to a

medical education research unit in a university medical center. This means that PhD students (and their supervisors) are imbedded in a stimulating atmosphere offering interactions with other PhD students and facilities for special PhD courses. This specific structure may also contribute to the scientific productivity of Dutch medical schools.

Relatively new is that researchers, living in other countries, find the Netherlands to be a place for high quality research supervision and obtain a Dutch PhD degree. This is a possibility that complies with Dutch university regulations and is often organised on individual basis. In 2005, the School of Health Professions Education, an initiative of Maastricht University, established a structured PhD programme to support researchers from all over the world with their proposals and studies. This initiative has also caused an increase of the number of PhD theses. And in part this may explain the net 'export' of supervision as presented in the results.

The national quality assurance system for higher education

In 1991, the first cycle of a new national quality assurance system of higher education reviewed the programmes of all medical schools in the Netherlands; since then, this requirement for accreditation and government financing has been executed in 1992, 1997, 2004 and 2011–2012. This comparative evaluation and reflection has had a major impact on medical education development and on the spread of published best practises in medical education. This has also stimulated the establishment of departments of education development and research in the schools, some of which are led by a professor in education. In an indirect way, this has probably also caused an increase of publications about medical education.

Mutual stimulation of research and educational practice

Typical for research in medical education in the Netherlands, compared to other fields of education research, is both the strong relationship with educational practice and the involvement of clinical and non-clinical teachers. In general education (i.e. primary, secondary and higher education) a substantial gap is often felt between researchers and practitioners and leaders in education, such as teachers, management and governing bodies. Research outcomes often do not adequately inform decision-making in educational practice and research questions are infrequently derived from practice (Broekkamp & van Hout-Wolters 2006). In medical education this gap is substantially smaller. The likely reason is that the research community in medical education exists of a mix of people from both social sciences and biomedical and clinical background, of researchers, curriculum developers and teachers. Research involves these various people in an open and inviting atmosphere and studies are often inspired by problems encountered in educational practice. These problems are than 'translated' through research into theoretical constructs that in turn strive to expand the body of evidence and moves forward our understanding of learning.

Dutch PhD theses in Health Professions Education 1972-2011

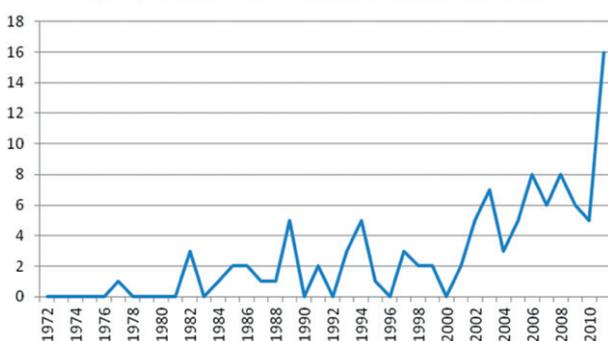


Figure 1. Medical education PhD degrees awarded in the Netherlands in the past 40 years.

A perpetuating circle of research and innovation is then the desirable result and the key value of research and faculty development.

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Note

1. In this 2007 publication, the term RRP was used. However, as not all publications can be signified as research, RPP is better terminology.

Notes on contributors

DEBBIE JAARMA, DVM PhD, is Professor of Evidence-Based Education and Director of the Center for Evidence-Based Education at Academic Medical Centre, University of Amsterdam, the Netherlands and founding member of the SIG Research in Medical Education.

ALBERT SCHERPBIER, MD PhD, is Professor of Medical Education and Dean, Faculty of Health, Medicine and Life Sciences, Maastricht University and a founding member of the SIG Research in Medical Education.

CEES VAN DER VLEUTEN, PhD, is Professor of Education, Chair of the Department of Educational Development and Research, Scientific Director of the School of Health Professions Education (SHE) at Maastricht University, Maastricht, The Netherlands. He holds honorary appointments in the University of Copenhagen (Denmark), King Saud University (Riyadh) and Radboud University (Nijmegen, the Netherlands).

OLLE TEN CATE, PhD, is Professor of Medical Education and Director of the Center for Research and Development of Education at University Medical Center Utrecht, the Netherlands and adjunct full professor at the Department of Medicine, University of California San Francisco. For this publication he conducted the bibliographic analyses.

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