The role of OM EDEN in building the EurOMA community

Paul Coughlan
Trinity Business School, Trinity College Dublin, Dublin, Ireland

Vincent Hargaden
School of Mechanical & Materials Engineering, University College Dublin, Belfield, Ireland

David Coghlan
Trinity Business School, University of Dublin Trinity College, Dublin, Ireland

Aida Idris
Faculty of Business and Accountancy, University of Malaya, Kuala Lumpur, Malaysia, and

Pär Åhlström
Department of Management and Organization, Stockholm School of Economics, Stockholm, Sweden

Abstract
Purpose – Doctoral education (DE) is central to the development and application of operations management (OM) thinking. The European Doctoral Educational Network (EDEN) seminar on research methodology in OM is a structured initiative developed in 1999 by European Operations Management Association (EurOMA) and European Institute for Advanced Studies in Management (EIASM). This intensive five-day seminar has run annually since and, to date, has engaged 486 students. The purpose of this paper is to ask: what role has the OM EDEN seminar played in the formation and academic career development of doctoral researchers, and how has it contributed to the development of EurOMA as a community of practice?

Design/methodology/approach – The authors developed a retrospective case on the design, launch and growth of the OM EDEN seminar employing two data gathering methods (collecting secondary and archival data, and a survey of four selected seminar participants) and a social network analysis.

Findings – The EDEN seminar is an effective educational intervention in developing doctoral researchers and their subsequent academic careers. The seminar has also contributed to EurOMA as a community of practice, bringing faculty together to teach, write and publish leading edge contributions in research methods for OM.

Research limitations/implications – The case is focused on the OM EDEN seminar only, within which the survey is limited to four of the early participants. While another set of participants might respond differently in detail, the authors’ expectation is that participant perception of the role of the seminar would not change. The paper provides an exemplar for European academic associations to guide how they might explore the formation and academic career development of doctoral candidates within a community of practice.

Practical implications – The seminar merits the ongoing support of EurOMA and EIASM, not just in educating doctoral students but also in bringing faculty together to publish leading edge contributions to the OM domain.

Social implications – The paper draws on the areas of student formation, academic career development and communities of practice to illustrate the role played by the OM EDEN seminar.

Originality/value – This paper is the first description, analysis and reflection on the role played by the OM EDEN seminar.

Keywords Community of practice, Academic career development, OM doctoral education, Student formation

Introduction
Doctoral education (DE) is central to the development and application of operations management (OM) thinking. Through DE, valuable skills such as problem framing and data analysis are developed. The European Doctoral Educational Network (EDEN) seminar on
research methodology in OM has been running since 1999, involving collaboration between the European Institute for Advanced Studies in Management (EIASM) and the European Operations Management Association (EurOMA). EIASM was founded in 1971 with the support of the Ford Foundation to create an identity for European management research and education, and to contribute to faculty development in European universities and schools. EurOMA started in 1994 and is a European-based international network of academics and practitioners who have a common interest in the continuing development of OM. In 1999, Christer Karlsson, then a EurOMA board member, initiated the EDEN doctoral seminar on research methodology in OM. Organised by EIASM, the intensive five-day seminar has run annually since and, to date, has engaged 486 students. While the seminar has gone through substantive evolution and underpinned methodological publications of the faculty, the role played by the seminar has not been described or reflected upon. So, the questions explored in this paper are:

**RQ1.** What role has the OM EDEN seminar played in the formation and academic career development of doctoral researchers?

**RQ2.** How has the OM EDEN seminar contributed to the development of EurOMA as a community of practice?

A response to the questions should be of interest to EIASM, EurOMA and, more generally, to the OM community. An exploration of these questions is timely. Bachrach et al. (2017) noted that the core functions of business schools include providing high-quality learning outcomes and promoting thought leadership. In DE, “Participants need access to expert training on research methods and the discipline of focus; access to intellectual dialogue and discourse among peers; and access to a rich set of reference materials, research tools, and data” (AACSB, 2013, p. 38). In response, various models of business DE have emerged including: in-house programmes at the students’ own university, and external modules offered by academic associations. In-house programmes, especially popular in the USA, include formal methods training at school level before commencing the dissertation research. In contrast, many European programmes value skill development through the research process (Coughlan et al., 2016). Here, modules run by academic associations serve a particular function in Europe (Forza and Karlsson, 2003). The OM EDEN seminar is an exemplar of this latter type, which we investigate using a retrospective case approach.

**Research context**

The context within which we explore the research questions has two dimensions: DE and collaboration between EIASM and EurOMA.

**Doctoral Education**

Research on DE has increased in significance and taken new directions since the 1990s. Earlier studies of DE focused on students’ rate of, and time to completion. Researchers then began to investigate intervention strategies in DE to alleviate the problem of a delayed or non-completed doctoral programme (Ali and Kohun, 2007; Lovitts and Nelson, 2000). More recently, this interest has shifted to the notion of doctorateness, defined as “mastery of the subject; mastery of analytical breadth (where methods, techniques, contexts and data are concerned) and mastery of depth (the contribution itself, judged to be competent and original and of high quality)” (UK Council for Graduate Education, 1997, p. 15). Here, students who struggle to understand what is expected of them tend to be those who have not had adequate mentoring on the implications and technicalities of doctoral study (Trafford and Leshem, 2009; Kiley, 2009). So, for AACS, “Management education leaders must accept a new responsibility: to shepherd a transformation of doctoral education to
better meet the needs of the academic and professional organizations graduates will enter, while preserving the quality and integrity of doctoral education amid pressures to cut corners and lower standards” (p. 10).

Additionally, there is a growing emphasis on student output, particularly in the form of publications and citations (Hanjalic, 2011), which implies that contemporary DE not only has to guide students to thesis completion, but also to equip them with skills to publish in high-impact journals. As such, DE is expected to facilitate the formation of students which can sustain their future growth, especially those who choose a career in academia and join a research community (Golde and Dore, 2001).

Collaboration between EIASM and EurOMA

EIASM is the node of networks of over 70 European schools, eight leading European academic associations and 50,000 management scientists from across the world. As such, it has a uniquely integrative role in Europe. In June 1988, EIASM formalised its DE initiatives as the EDEN. The EDEN seminars are based on week-long modules covering the main areas of management sciences (accounting, finance, marketing, organisational studies, and OM). By 2017, over 5,500 doctoral students from European universities had participated in EDEN, interacting and sharing common objectives and concerns, positioning their thesis questions with respect to European research, engaging with international and global perspectives, and networking with European management educators.

The design and launch of EDEN was timely and continues to be relevant in the context of DE developments in Europe. Roberts (2002) recommended not restricting PhD training to the student’s home institution. The more broadly based Salzburg II (2010) Recommendations highlighted that DE must focus both on developing the student’s research project and on individual professional development. They identified doctoral candidates as early stage researchers whose research mindset and professional career development should be cultivated through innovative structures, international collaboration and mobility.

As an association, EurOMA has sought ways to focus on doctoral student development and, in 1998, identified the EIASM EDEN seminar model as appropriate. The resulting intensive one-week OM EDEN seminar is organised around a peer-to-peer learning model, integrated sessions introducing students to research methodology issues in OM, leading them to critique choices in approaching their doctoral research. Each day is built around a specific methodology and led by research-active OM faculty. However, rather than each day’s methodology being viewed in isolation, the seminar coordinator facilitates the development of an integrated perspective over the week. The objective is to change how the doctoral students think about research methodology and “aims at helping the young researcher get a hold of the vast scope of research approaches and plan his/her research in a way that is appropriate for the issues and empirical base” (Coughlan, 2011).

Positioning the OM EDEN seminar

The OM EDEN seminar is one of the structured initiatives developed by EurOMA to support the doctoral and early stage academic career development of members. These initiatives have led to a unique European path for the formation and development of doctoral students (Karlsson and Voss, 2009; Coughlan et al., 2016):

1. first-year students typically attend the OM EDEN seminar;
2. second-year students may attend the EurOMA doctoral workshop to present initial research ideas;
(3) third-year students may attend the EurOMA doctoral workshop again to present draft research outputs;
(4) on completing their PhD programme, graduates may present a paper at the annual EurOMA conference;
(5) graduates may prepare their work for publication by attending the publishing workshop; and
(6) to assist in career development, graduates may participate in the Young Scholars Workshop.

This six-part programme not only provides a path for the development of researchers and faculty, it seems also to facilitate growth of a vibrant community of researchers in OM through networking and engagement among participants.

Framing the relationships
The questions posed in this paper are:

RQ1. What role has the OM EDEN seminar played in the formation and academic career development of doctoral researchers?

RQ2. How has the OM EDEN seminar contributed to the development of EurOMA as a community of practice?

These questions draw on the areas of student formation, academic career development (RQ1) and communities of practice (COPs) (RQ2), each of which we explore.

Student formation and academic career development (RQ1)
We explore student formation using three perspectives evident in education philosophy: self-formation, socialisation and social transformation:

(1) Self-formation: the development of the intellectual capacity of the student is based on communications, observations, experience and reflections (Seery, 2014). Learning is wholesome and enriching, intended to build one’s inner strength, ethics and character.

(2) Socialisation: education is there to inform on one’s role and status in society (Grenfell, 2009). Awareness of difference in role or status builds self-discipline and teamwork, besides improving engagement and interaction with others.

(3) Social transformation: education develops critical thinking, where students are encouraged to challenge the status quo. Knowledge is brought to the stage where one can be innovative and make positive social changes (Desjardins, 2015).

Academic career development is evident in research productivity, research impact, networking and engagement. Research productivity is demonstrated through the number of publications, while research impact is measured by number of citations (Long et al., 2009; Pilkington and Meredith, 2009). Networking and engagement occur through collaboration between academics and participation in academic associations (Ynalvez and Shrum, 2011).

Communities of Practice (RQ2)
CoPs are formed by people who engage in a process of collective learning in a shared domain of human endeavour (Wenger et al., 2002). Three characteristics are crucial:

(1) The domain: it has an identity defined by a shared domain of interest. Membership implies a commitment to the domain and a shared competence that distinguishes members from others.
The community: in pursuing interest in their domain, members engage in joint activities, help each other and share information. They build relationships that enable learning from each other; they care about their standing with each other.

The practice: members of a CoP develop a shared repertoire of resources over time and with sustained interaction: experiences, stories, tools and ways of addressing recurring problems.

Lave and Wenger (1991) and Wenger (1998) proposed that, when learning in a CoP, participants gradually absorb and are absorbed in a “culture of practice”, giving them exemplars, leading to shared meanings, a sense of belonging and increased understanding. For researchers, shared practices include research collaboration and co-publication.

Research design
Case research allows questions of why, what and how to be answered and to deliver understanding of the nature and complexity of the phenomenon (Voss et al., 2016). We developed a retrospective case (Voss et al., 2016) on the design, launch and growth of the OM EDEN seminar. Applying the tests proposed by Miles and Huberman (1994) to the case selection: the OM EDEN seminar is relevant to the research questions and conceptual frame; the phenomena to be studied can appear; and, while generalisability is not of particular concern, it may be possible. Given the relationship of some of the authors with EIASM and EurOMA, the case is feasible with access to both archival and interview data. Finally, informed consent is sought without risk to informants. The case employed two data gathering methods (collecting secondary and archival data, and a survey of four selected seminar participants) and, a social network analysis (SNA).

Collecting secondary and archival data
We accessed secondary and archival data by drawing from the EIASM EDEN programme overview, OM EDEN student lists, EurOMA board minutes and OM EDEN programme outlines. For each student, we sourced specific additional information on publications, employment and engagement in OM from secondary sources including ISI Web of Knowledge, Scopus, Google Scholar, Research Gate, LinkedIn, EurOMA conference proceedings and institutional websites.

Survey of selected participants
Our research questions aim to provide new insights on the role of the OM EDEN seminar, its relevance and context. Case studies and surveys are complementary in such exploratory research. Exploratory and descriptive survey research provides new insights on the phenomenon of interest, its relevance, the contexts in which it takes place and on how to measure the involved concepts (Forza, 2016). While survey research can be used to explore impact in OM (Forza, 2016), assessing the impact of the OM EDEN seminar on participants and the EurOMA community is not of direct interest in our research.

Drawing from the secondary data sources accessed earlier, we identified four participants in the early seminars (from 2000 to 2005), who had developed their academic careers and are research-active in the OM community. We surveyed these participants directly and focused the survey questions on their student formation experiences and how that linked to academic career development. These questions are relevant also to the core functions of business schools explored by Bachrach et al. (2017):

(1) To what extent was the EDEN doctoral seminar a critical intervention:
  - In his/her development of as a doctoral researcher?
- In his/her academic career?
- In his/her OM research focus?
- In his/her connections in the EurOMA community of practice?

(2) Each participant has co-authored with many researchers in developing and publishing research:
- In selecting his/her co-researchers/co-authors, to what extent was he/she influenced by their participation in the EDEN doctoral seminar?

(3) It has been some years since participants had engaged in the EDEN doctoral seminar. As he/she looked at the growth and development of the EurOMA community of practice:
- What role had the EDEN doctoral seminar played?
- How might that role be enhanced and improved?

Finally, we asked if each participant was satisfied that we might refer to him/her by name in our paper or disguise their identity when describing and reflecting upon his/her profile. All four faculty responded to all questions and gave permission for their publications, co-authoring relationships and identities to be included in the paper.

Social Network Analysis
To explore their engagement in the OM community and to develop further insights into the career development of the faculty members surveyed, we undertook a SNA. SNA is an approach and an analytical method which seeks to understand structural characteristics and relationships in networks at organisational or interpersonal levels (Wichmann and Kaufmann, 2016). Co-authorship of papers in academic journals in a specific discipline illustrates patterns of collaboration within that academic community (Behara et al., 2014). Fritsch and Kauffeld-Monz (2010) highlighted the effect of the network structure, the position of an actor within the network, and the strength of the relationship to study the conditions that foster the transfer and the absorption of knowledge and information within the networks. As the nature of these relationships may not be obvious, applying SNA is analogous to taking “an organisational x-ray” (Serrat, 2017).

We measured along three common dimensions described later: degree centrality, collaboration intensity and betweenness centrality (Santonen and Ritala, 2014; Wichmann and Kaufmann, 2016). We generated our data by using the Scopus database to find the co-authors for each of the four participants surveyed. Scopus was appropriate as it is the largest abstract and citation database of peer-reviewed literature. We used the software package UCINET to analyse the network data and NetDraw to visualise the data.

Findings
We present the findings on the OM EDEN seminar in two parts: an overview of the seminar from the outset and a survey of four early participants.

The OM EDEN seminar as an intervention
The first seminar in 1999 attracted 25 students from 17 institutions in eight countries. The reputation of the seminar grew and, over the 19 years to date, 486 students from 29 countries and 142 institutions participated. Table I summarises the features of each cohort.

The profile of participants per country is shown in Figure 1. Through word of mouth, many students told friends and fellow students of their experiences. EurOMA promoted the seminar as a key part of its DE policy. Then as supervisors recognised the value of
participation, several institutions revised their doctoral programme curricula, recognised the seminar for credit and required student participation.

From the profile in Figure 1, source countries can be classified as “runners”, “repeaters” or “strangers” (Parnaby, 1994). A repeater is defined as a country which sent participants more than once, while a runner is one which sent participants every year. Strangers are countries which sent just one participant. Over the 19 years, universities from the Netherlands, Sweden, Italy, Denmark and the UK had at least one participant every year. Some 15 countries fall into the repeater category, while eight are strangers.

Figure 2 identifies the top 10 participating institutions, which include the leading schools in Europe. This categorisation could be seen as being more relevant, particularly since some of the participants are not from the country in which they studied, and universities are

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of students</th>
<th>No. of institutions</th>
<th>Institutions</th>
<th>No. of Countries in which located</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>25</td>
<td>17</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>2000</td>
<td>21</td>
<td>18</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>2001</td>
<td>33</td>
<td>19</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>2002</td>
<td>20</td>
<td>16</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>2003</td>
<td>23</td>
<td>18</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>2004</td>
<td>24</td>
<td>19</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>2005</td>
<td>22</td>
<td>18</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>2006</td>
<td>28</td>
<td>19</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>2007</td>
<td>22</td>
<td>16</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>2008</td>
<td>26</td>
<td>20</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>2009</td>
<td>28</td>
<td>23</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>2010</td>
<td>26</td>
<td>19</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>2011</td>
<td>22</td>
<td>16</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>2012</td>
<td>27</td>
<td>17</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>2013</td>
<td>27</td>
<td>15</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>2014</td>
<td>25</td>
<td>17</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>2015</td>
<td>27</td>
<td>19</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>2016</td>
<td>28</td>
<td>20</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>2017</td>
<td>32</td>
<td>21</td>
<td></td>
<td>11</td>
</tr>
</tbody>
</table>

Table I. Geographical profile of EDEN participants

Totals 486 participants 142 different institutions 29 different countries

Figure 1. Profile of number of EDEN participants per country (1999-2017)
where socialisation into the community of practice takes place. Several institutions sent students on as many as ten occasions. Some students took the seminar, reached senior academic positions after graduation, and then sent their PhD students to participate.

Survey of participants
We identified four participants in the early seminars (from 2000 to 2005), who had developed their academic careers and are research-active:

- Alistair Brandon-Jones (AB-J), Professor of Operations and Supply Chain Management, University of Bath, UK.
- Pamela Danese (PD), Associate Professor of Operations and Supply Chain Management, Università degli Studi di Padova, Italy.
- Matteo Kalchschmidt (MK), Vice-chancellor for Internationalization and International Relations, Università degli Studi di Bergamo, Italy.
- Pietro Romano (PR), Professor of Supply Chain Management, Business Marketing and Product Development, University of Udine, Italy.

These individuals came from institutions which, since 1999, were regular contributors of participants to the EDEN seminar. Responding to the questions outlined earlier, they shared their experiences and reflections, which we summarise below. In brief, all considered the OM EDEN seminar as a critical intervention in their DE and career formation.

The OM EDEN seminar as a critical intervention
Developing as doctoral researchers. We explored the extent to which participation in the OM EDEN seminar was perceived as a critical intervention in their development as doctoral researchers. For MK, it was “very relevant”. He participated as a second-year PhD student. It allowed him to reframe his doctoral research and to define “properly” the theoretical and empirical approach to his work. He believes that “it is a must seminar” for OM students.

For PD, participation was “fundamental”. She participated as a first-year PhD student. It was fundamental to her overview of choices of research methodology at the beginning of her PhD programme. Subsequently, PD used two methodologies: action research and case study research: “As regards action research, my supervisor, and in general none in my University, was an expert on this methodology, and thus it was fundamental realizing from the […] seminar that action research was appropriate for a research project I was conducting in collaboration with a company”.

Figure 2.
Profile of top 10 participating institutions at EDEN seminar
For PR, participation had a “great impact” on his doctoral research as he was among the pioneers in Italy in the supply chain management field: “[…] at that time it wasn’t so clear what a supply chain was and how to approach it from a methodological perspective. I had the opportunity to discuss my doubts with Chris Voss and Christer Karlsson, and this helped me a lot”.

AB-J found the EDEN seminar “really useful” for his early development. It allowed him to share experiences with other PhDs who were at a similar stage and bounce ideas off them about methods, concepts and literature. In addition, the seminar gave him a “good grounding in a range of different alternative research strategies” and he felt more centred in an OM community.

**Developing an academic career.** We explored the extent to which participation was perceived as a critical intervention in developing their academic careers. For MK, it was “[…] very relevant: I still refer to many topics I learnt there during the development of my research”. For PD, it was “important, for different reasons: i) having an overview of the OM research methods helped me to more consciously plan my research activities, projects and papers. ii) During the EIASM seminar I knew […] Prof. Simon Croom. We remained in touch for several years and in 2006 I spent a period as a visiting scholar […] under his supervision”. For PR, “EDEN was a terrific occasion to get introduced as young scholar in an international academic network. Today, many alternatives exist, but that time EDEN was the “occasion”. AB-J highlighted that the EDEN seminar was one of several interventions during his PhD journey that allowed him to “test ideas in a “safe” environment”. Although the time constraint had limited the coverage of each method discussed, the seminar allowed him to see “the potential of combining qualitative and quantitative methods in a robust manner”, something which has influenced his approach in most of his subsequent research.

**Developing an OM research focus.** We explored the extent to which participation in the EDEN seminar was perceived as a critical intervention in developing each respondent’s OM research focus. For MK, it was “[…] very relevant: The focus of the seminar is very much OM related and the capability of the speakers to help focusing the methodology to specific OM issues is extremely valuable”. For PD, talking informally with the EDEN faculty “[…] helped me to clarify my ideas about what could have been more appropriate or exciting for me as a research focus”. PD continued to interact with Simon Croom, as an expert of SCM: “This is today my first research interest”. PR related that “EDEN was a key spark for my academic career, OM research focus and international connections”. For AB-J, the EDEN seminar not only covered different methods, but also helped “shape my thinking quite early on around what method(s) I felt might be most suitable for my PhD research and how I might think more effectively about them”.

**Connecting with the EurOMA community of practice.** We explored the extent to which participation was perceived as a critical intervention in developing connections in the EurOMA community of practice. For PR, being part of a network gave him the opportunity to become involved in the organisation of the Venice EurOMA conference and of the first joint EurOMA-POMS conference in Como. In turn, he was editor of the special issues from the conferences: “Thanks to these occasions I created my network of OM friends, co-authors and – indeed – I also met my wife, who is one of the participants in the early EDEN seminars”. AB-J felt that the EDEN seminar was certainly linked to EurOMA and participants were encouraged to become involved in EurOMA PhD workshops and conference.

**The OM EDEN seminar as an influence**
The four participants surveyed co-authored with many researchers in the publication of their research. We explored how, in selecting their co-researchers/co-authors, they were
influenced by their participation in the EDEN doctoral seminar. For MK, the influence was limited: “I shared with some people I met there in the initial part of my career but we were working on different research topics and, so, we had limited possibilities to share research efforts. I had more to share during other initiatives such as the EurOMA conferences”. PD has published extensively with two co-authors who, although she had not known it on the occasion of (her) EDEN seminar, had attended EDEN in previous years: “Thus, we have a common understanding, language and background which facilitate our research activities”. For PR, “EDEN had an important role in my first publication. I initially wrote a literature review on SCM with Simon Croom who held the initial seminar on research methodology during the EDEN week. That was my first paper and one of the first reviews on SCM literature. Today the paper has more than 1,000 citations and I remember it with pleasure. Moreover, my wife is my preferred co-author. I cannot say that I chose her as wife because of the participation to the EDEN seminar, but surely I chose her as co-author because of our similar views on methodologies which were shaped by our participation to EDEN”. According to AB-J, his research collaborations have emerged “either with work colleagues […] or more often during conferences”. Like MK, he indicated that EurOMA conferences have been instrumental in forming these collaborations: “IPSERA and EurOMA in the first couple of years of my career, then EurOMA and POMS in the last 7 or so years”.

**Growth and development of the EurOMA community of practice**

**Role played by the EDEN doctoral seminar.** We explored the role played by the OM EDEN seminar in the growth and development of the EurOMA community of practice. For PD, the main role of the seminar is instilling in PhD students a professional ethic: “Research is tiring and there are some important rules a researcher should respect in planning and conducting each research project, depending on the research methodology. Following these rules is the only possible way to publish papers and grow as a researcher”.

For MK, it is important and valuable for PhD students during the design and development of their early research careers: “I strongly support my PhD students to participate in the seminar (and directly finance some in their participation)”. The role is enhanced through the broader EurOMA supportive activities with the seminar providing a path into the EurOMA community”.

AB-J believes that the EDEN seminar “makes you feel part of something larger”, instead of being the only OM/SCM researcher in an institution. Participating in the seminar was “a really uplifting experience and makes you feel like the research you’re doing in interesting and worthwhile. In other words, you’re surrounded by people who “speak your language” and feel your pain!” The seminar also reinforced his pre-existing view that there is no “right” research strategy or method set, and that one should keep a more open-minded view on different perspectives and methods.

**Analysing the social network**

Co-authorship is a form of social networking in research collaborations (Behara et al., 2014). We explored the academic career development of the four participants as evidenced by their research in OM practice and networking in the community. Ynalvez and Shrum (2011) suggested that networking forms the basis of the interactive processes that bring researchers together. The role of networking in developing COPs can be appreciated through a SNA.

Figure 3 illustrates the network of connections among the four participants and their co-authors, some of whom were shared. The participants are shown as large circles, signifying their nodal roles. The small squares represent their co-authors while the arrows
indicate the linkage between nodes and co-authors. Table II summarises the network connections, degree centrality, collaboration intensity and betweenness centrality evident in the data. Each of these measures is discussed below.

Basic demographics
Hawe et al. (2004) define a component as a part of a network in which all authors are directly or indirectly connected by at least one connection. There are 74 authors (components) in the network (Figure 3), each represented as a node. Therefore, each author can have at most 73 connections. The component analysis reveals how the participants are connected but separate from each other. In the majority of SNA examples, components rarely approach the maximum number of connections. For this analysis, the data is symmetric since, if author B is a co-author of A, then author A is also co-author of B.

In conjunction with the network diagram (Figure 3), degree centrality is a measure to show the number of connections of an individual actor in the network and the distribution can provide useful insight into the social structure. In Table II, the sum of the connections from an actor/author to others is a measure of how influential the actor may be. PR has ties to 67 other authors, while PD, MK and AB-J are sources for large portions of the network. These authors have high potential to be influential. There is a variation in the roles that the authors play in the network. In order to compare this network to other networks of different size, the data are normalised by expressing the sum of the connections from an actor to others as a percentage of the total number of actors (Hanneman and Riddle, 2005; Santonen and Ritala, 2014). This is shown in the "Mean" column (Table II), where, for instance, PR has ties to 91 per cent of the remaining actors.

Centrality and intensity
In SNA, the extent of networking is measured using three dimensions: degree centrality, collaboration intensity and betweenness centrality (Santonen and Ritala, 2014). To indicate centrality of each of the four participants as a node in the network, we utilise measures of degree centrality and betweenness centrality. We also measure the absolute co-authorship...
<table>
<thead>
<tr>
<th>Actor name</th>
<th>Maximum</th>
<th>Sum</th>
<th>Mean</th>
<th>SD</th>
<th>Direct connections</th>
<th>nDegree</th>
<th>Number of co-authored papers</th>
<th>nCollab</th>
<th>Structural power</th>
<th>nBetween</th>
</tr>
</thead>
<tbody>
<tr>
<td>Romano</td>
<td>15</td>
<td>67</td>
<td>0.918</td>
<td>2.345</td>
<td>26</td>
<td>0.356</td>
<td>67</td>
<td>0.061</td>
<td>2,505</td>
<td>47.66</td>
</tr>
<tr>
<td>Kalchschmidt</td>
<td>15</td>
<td>60</td>
<td>0.822</td>
<td>2.325</td>
<td>25</td>
<td>0.342</td>
<td>60</td>
<td>0.055</td>
<td>2,326</td>
<td>44.254</td>
</tr>
<tr>
<td>Brandon-Jones</td>
<td>10</td>
<td>58</td>
<td>0.795</td>
<td>1.872</td>
<td>23</td>
<td>0.315</td>
<td>58</td>
<td>0.053</td>
<td>2314</td>
<td>44.026</td>
</tr>
<tr>
<td>Danese</td>
<td>3</td>
<td>32</td>
<td>0.438</td>
<td>0.74</td>
<td>18</td>
<td>0.247</td>
<td>32</td>
<td>0.029</td>
<td>1,153</td>
<td>21.937</td>
</tr>
<tr>
<td>Overall mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>140.514</td>
<td>2.673</td>
</tr>
<tr>
<td>Overall SD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>499.949</td>
<td>9.512</td>
</tr>
</tbody>
</table>
output from the study period for each participant, which we call the collaboration intensity. These three measures are described below and summarised in Table II:

- **Degree centrality** (Freeman, 1979) is the simplest, most used and easiest-to-interpret measure of the node’s network position. Degree centrality calculates how many direct connections each node has with other nodes. A high degree centrality indicates that the node has a central position in the network among other nodes (indicating a “hub” or otherwise relevant position).

- **Collaboration intensity** is, in principle, a similar measure to degree centrality, but considers if a certain co-authorship has been conducted multiple times (whereas in the degree centrality all unique co-authorship connections are counted only once). Thus, collaboration intensity is interpreted as the total number of co-authorship connections in the measured period of time.

- **Betweenness centrality** (Freeman, 1979) is used for investigating the structural position of a particular node between clusters of nodes in a network. It can be interpreted as measuring the nodes based on their position and role as a gatekeeper between two or more independent components. Such nodes may be in a structurally powerful position, able to exploit their gatekeeper role for the purposes of knowledge and resource sharing between the separate parts of the network.

*Degree centrality*

Actors/authors with more ties to other actors in a network may be in an advantageous position as they may be able to access more of the resources of the network. Given their number of ties and position in the network, they may be seen as desirable connections as potential co-authors by other actors in the network, or by new actors who enter the network (e.g. a PhD applicant selecting a university or supervisor). Degree centrality calculates how many direct connections each node has with other nodes in the network. A high degree centrality (shown in Table II) indicates that the four participants have a central position in the network among other authors. The column “nDegree” standardises the degree measure so that the results could be compared across networks of different sizes and densities.

*Collaboration intensity*

Collaboration intensity includes the weight of the vertex between two nodes. In the OM EDEN context, degree centrality measures if two authors ever collaborated or not, whereas collaboration intensity captures the number of co-authored papers (i.e. number of co-authorships is the “weight”). So, actors with high collaboration intensity may be seen as OM thought leaders. The results are shown in Table II, with the authors having the highest degree result being regarded as the most influential.

*Betweenness centrality*

Betweenness centrality views a node as being in a favoured position in the network to the extent that the node is positioned between pairs of nodes in the network. Examining the network diagram (Figure 3) and Table II identifies the authors in the network as those on whom others depend to make connections. These authors would be perceived to have power in the network. There is a high level of variation in author betweenness (from 0 to 2,505) and overall in the network (overall network mean is 140 and standard deviation is 499). We can conclude that the overall network centralisation is low to moderate, as the centralisation index is 45 per cent.
Summary
We identified four participants in the early seminars (from 2000 to 2005), who had developed their academic careers and are research-active in the OM community. We surveyed these participants and carried out SNA to identify their engagement in the community. The visualisation of the network in Figure 3 illustrates the four participants as active nodes. This visualisation is supported by the key metrics of degree centrality, collaboration intensity and betweenness centrality. The evident high degree centrality indicates that these participants as authors have a central position in the network among their co-authors. The high collaboration intensity shows the four participants as thought leaders in the OM community. The betweenness centrality measure identifies the four participants as having power in the community and on whom others depend to make connections.

Discussion
The research questions explored were:

RQ1. What role has the OM EDEN seminar played in the formation and academic career development of doctoral researchers?

RQ2. How has the OM EDEN seminar contributed to the development of EurOMA as a community of practice?

We employed two data gathering methods (collecting secondary and archival data, and a survey of four selected seminar participants) and a SNA in the retrospective case of the OM EDEN seminar over its 19 years from 1999 to 2017. Towards RQ1, we have explored the self-formation, socialisation and social transformation processes experienced by OM doctoral candidates who participated in the seminars; towards RQ2, we have explored how these processes have contributed to the development of EurOMA. Figure 4 illustrates the relationships underlying these questions.

![Diagram](Image)
**RQ1: formation**

Our findings suggest a role for the EDEN seminars in the formation of doctoral students, summarised in Table III.

**Self-formation.** The concept and practice of wholesome, interactive learning as described by Seery (2014) appears to be well integrated throughout the seminars. By exposing participants to an intensive exploration of specific OM methodologies and encouraging self-reflection, the seminars serve as a “retreat” which focuses on developing the students’ research mindset. The students learn to synthesise and advance theories, become aware of the choice of methodologies for their research and can make informed decisions when selecting the methodology for their doctoral research. In short, they learn the content of the community of practice.

**Socialisation.** The EDEN seminar provides opportunities for participants to interact with faculty who share their knowledge and experience of OM research, particularly at doctoral level. The resulting networking with these thought leaders and other participants helps each student to position his/her research within the broader OM context and identify its unique contributions to the domain and the community of practice. In this regard, the seminars enable socialisation into the community.

**Social transformation.** The seminar encourages participants to think critically about contemporary issues in OM, and to anticipate with confidence their transition from student to thought leader through their research. The transformation takes place when the students are questioned about the significance and implications of their research from a social point of view. Like a “cadet school”, students are mentored to see themselves as agents of change who, as members of the community of practice, can link their research to issues in practice and society.

**RQ1: academic career development**

Academic career development evolves based upon the student formation achieved through DE. This development is evidenced by the four indicators outlined earlier: research productivity, research impact, networking and engagement. We explore academic career

<table>
<thead>
<tr>
<th>Component of student formation</th>
<th>Characteristics</th>
<th>Evidence of design and intentions of the EDEN seminar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-formation</td>
<td>Education is a process of communicating, observing, experiencing and reflecting</td>
<td>Participants learn to synthesise and advance theories</td>
</tr>
<tr>
<td></td>
<td>Builds character, ethics and intellectual capacity</td>
<td>Exposure to different research approaches and methodologies “Retreat”</td>
</tr>
<tr>
<td></td>
<td>Learning is wholesome and enriching for the student.</td>
<td></td>
</tr>
<tr>
<td>Socialisation</td>
<td>Education is there to inform on one’s role and status in society</td>
<td>Interaction with experts gives some idea of the actual viva process</td>
</tr>
<tr>
<td></td>
<td>Awareness of role/status difference builds self-discipline and teamwork</td>
<td>Networking with other participants helps to identify the unique contributions of one’s research “Summer camp”</td>
</tr>
<tr>
<td></td>
<td>Improves engagement and interaction with others</td>
<td></td>
</tr>
<tr>
<td>Social transformation</td>
<td>Key element in education is to develop critical thinking</td>
<td>Guides development of research which can challenge constructively and make significant theoretical and practical contributions</td>
</tr>
<tr>
<td></td>
<td>Students are encouraged to challenge the status quo</td>
<td>Builds personal qualities and knowledge needed to lead the transformation “Cadet school”</td>
</tr>
<tr>
<td></td>
<td>Knowledge is brought to the stage where one can be innovative and transform society</td>
<td></td>
</tr>
</tbody>
</table>

Table III. Doctoral student formation through EDEN seminar
development based upon the 205 of the 486 students for whom we have PhD graduation data. The evidence suggests that, of the 205 students, 170 found employment in faculty or researcher positions upon graduation. Further analysis shows that many were employed in schools/universities of equivalent or higher rank than their doctorate awarding institution. Research productivity of the 205 students was evidenced by 837 published papers with a total research impact of 7,366 citations.

**RQ2: building the EurOMA community**
We reflect on the role played by the EDEN seminar in developing the EurOMA CoP through student formation and academic career development. This is illustrated in Figure 4 and draws on McDermott’s (2002) stages in the lifecycle of a CoP:

- **Inquire**: through a process of exploration and inquiry, EurOMA identified the EDEN seminar as an appropriate way to enable student formation and academic career development.

- **Design**: EurOMA located EDEN on the path for formation and development of doctoral researchers (Karlsson and Voss, 2009) including activities and group processes.

- **Prototype and launch**: the original EDEN faculty delivered the early seminars as a pilot, gained commitment, tested assumptions, refined the strategy and established a dominant design.

- **Grow**: the students and EDEN faculty engaged in the early seminars as collaborative learning and knowledge sharing activities. The growth of the CoP was evidenced in the special issue of *IJOPM* (2002) and in two edited books (Karlsson, 2009, 2016), all on research methods in OM. In these publications, the contributing EDEN faculty formalised and codified choices in good research practice for researchers in OM. These three publications are highly cited and used extensively in OM DE and research.

- **Sustain**: sustaining the EurOMA community is enabled through the formation of the students, the development of their academic careers and the codification of the research practice evident in the EDEN-based publications. Together, they cultivate the knowledge created by the community and inform new strategies, goals and activities for the future. The 205 of the 486 students for whom we have PhD graduation data participated at an average of 3.1 years before graduation (standard deviation $= 1.67$). At this early stage, the students were introduced to 25-30 other doctoral students from outside of their own institutions. Many went on to participate in the doctoral workshop at EurOMA annual conferences. On graduation they have participated in the Young Scholars Workshop and present full papers in the conference programme. In all of these activities, they meet fellow participants from EurOMA, many of whom have participated in the EDEN seminars and are sustaining the community of practice.

**Implications and emerging opportunities**
The OM EDEN seminar is a source of professional and personal pride for EurOMA, EIASM and the contributing faculty. There is a shared recognition that the community needs to be nurtured and supported through DE in order to remain relevant, both to research and to practice. The OM EDEN seminar provides student access to education, builds a sense of community and enables contributing faculty to collaborate, to publish and to advance the field. In addition, this CoP represents the career focus for many and it will not fulfil their ambitions or potential to contribute if it does not regenerate and educate routinely.
The EDEN seminar is at the heart of this community and merits the ongoing support of EurOMA in linking it to its programme of developing doctoral students. For EIASM it is a classic example of its EDEN seminar series, but one which has distinguished itself, not just through engaging doctoral students over many years, but also in bringing faculty together to publish leading edge contributions to the domain.

To plan the next steps, we sought suggestions from the four participants surveyed from the early seminars on how the role of the EDEN seminar in the growth and development of the EurOMA CoP might be enhanced. For MK, it would be important for PhD students to know when the seminar would be most beneficial in their doctoral research and to make OM research groups more aware of the initiative: “I think that providing students with structured literature on research methodologies is very important and should be more emphasised also since there is not enough time during the seminar to do everything”. Looking to the future, he would value support for students planning to apply statistical methodologies such as qualitative data analysis for case studies or structural equation modelling for survey data.

PR noted that “although today many alternatives exist, I think that EurOMA should continue to invest in the EDEN seminar”. In Italy, he is a board member of the Association of Management Engineers which is discussing the future of its PhD summer school. The board is surveying and interviewing young scholars. Emerging suggestions on facilitating cross-country research funding, structured networking and job placement may be worth including in the EDEN seminar. For PD, dedicating a discussion/section on ethics in research could be relevant. AB-J suggested that “a Linkedin/Facebook/WhatsApp option” should be available to keep those who attend the seminar connected and “to act as a light-touch support group”. Another possibility would be to build follow-up workshops for all key methods.

Conclusion
The research questions explored were:

- RQ1. What role has the OM EDEN seminar played in the formation and academic career development of doctoral researchers?

- RQ2. How has the OM EDEN seminar contributed to the development of EurOMA as a community of practice?

The evidence suggests that the EDEN seminar is an effective educational intervention in developing doctoral researchers and their subsequent academic careers. Participation provides an opportunity for students to access practical research methods in a systematic way. More importantly, they are exposed to socialisation by being “away” in an international domain and bringing “home” the knowledge acquired. They are enabled to see a route to contributions to knowledge. Together, these experiences have facilitated a deeper formation than might have been achievable at “home”. This formation has been complemented by the collaboration among the faculty to publish leading edge contributions on research methods in OM. Overall, the role played by OM EDEN has been formative, not just for students and faculty, but also for EurOMA, the OM domain and EIASM.

References

Bachrach, D.G., Bendoly, E., Beu Ammeter, D., Blackburn, R., Brown, K.G., Burke, G., Callahan, T.,
unacceptable methods, and the social obligations of business schools”, Decision Sciences, Vol. 48
No. 3, pp. 561-585.

Vol. 34 No. 12, pp. 127-142.

management: the role of academics and practitioners in the development of research and
practice”, International Journal of Operations and Production Management, Vol. 36 No. 12,
pp. 1673-1695.


Routledge, Abingdon, pp. 79-164.

efficiency by collaborative networks”, Decision Line, July, pp. 4-7.

pp. 215-239.

application of social network analysis in the context of regional innovation networks”, The

About Doctoral Education, Pew Charitable Trusts, Philadelphia, PA, available at: www.phd-
survey.org (accessed 20 December 2016).

Hanneman, R.A. and Riddle, M. (2005), Introduction to Social Network Analysis, University of California,
Riverside, CA, available at: http://faculty.ucr.edu/~hanneman/


in information systems: an empirical analysis of the impact of academic origin and academic

programs”, Academe, Vol. 86 No. 6, pp. 44-51.


Corresponding author
Paul Coughlan can be contacted at: coughlnp@tcd.ie

For instructions on how to order reprints of this article, please visit our website: www.emeraldgrouppublishing.com/licensing/reprints.htm
Or contact us for further details: permissions@emeraldinsight.com