



The use of mixed methods social network analysis to evaluate healthcare professionals' educator development: An exploratory study

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ABSTRACT

Introduction: Healthcare professionals' educator development (HPED) is costly, both financially and in terms of clinicians' time. However, there is little research into how HPED programs can be evaluated. Research in other educational fields has demonstrated that the analysis of changes in learners' social networks and the associated changes in social capital can reveal interesting and important effects of educational programs which would, otherwise, be unknown. However, research on the social network impact of HPED is minimal.

Aims: The authors present an innovative exploratory study of a new evaluation methodology, which considers the social network and social capital of a participant after completion of a HPED program. To the best of the authors' knowledge, this is the first time that such a method has been used in HPED.

Method: Mixed methods social network analysis (MMSNA) was used to measure and further understand the social capital of the participant after completion of a HPED program. Data collection was via a self-report template and a semi-structured interview. An exploratory case study of a medical doctor who completed a HPED program at master's level was conducted in October 2018 at Edge Hill University, Ormskirk, UK.

Results: The relationships made through the HPED program provided the participant with access to social capital in the form of educational expertise, knowledge, and information about job opportunities. These new relationships changed the social network structure, with reduced network constraint and increased number of structural holes in the network of the participant. Such access to resources unavailable to others within the network placed the participant at an ongoing advantage.

Conclusion: MMSNA can reveal key benefits of HPED programs which would not be apparent with other methodologies. The methodology produces results that can be transferred to other HPED programs.

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Introduction

In 2013, the World Health Organization issued the guidelines for the transformation and upscaling of healthcare professionals' education (HPE) [1]. A key part of this initiative urges educational institutions providing HPE to "improve the competencies of existing staff" [1]. In the context of stretched

resources in the fields of both health and education 2–5, ensuring healthcare professionals' educator development (HPED) represents good value, especially for a given monetary spend, is, therefore, a pressing international concern. However, there is a scarcity of research that evaluates the cost and value of such programs, and a multinational group

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of experts have issued the “Prato statement,” calling for the urgent creation of an evidence base [2].

The evaluation of the value of HPED programs provides major challenges to researchers. There are a variety of stakeholders in such programs, and the learners must implement their new skills and knowledge in diverse working environments. The inability of more established methodological techniques to account for such complexities has led to the call for more diverse approaches to evaluation [6]. We answer this call by presenting a novel evaluation methodology, illustrated with a case study.

Value

An essential aspect of evaluation research is to consider how “value” may be understood and measured. Value can be defined as “the importance, worth, or usefulness of something” [7]. Such “worth” or “value” may not be related to financial cost but is dependent on the perspective and interests of the evaluator [8]. The importance of the perspective of the stakeholder has been clearly demonstrated by Maloney et al. [9]. They meticulously compared the costs and effects of two different methods of delivering an educational intervention for healthcare professionals in Australia. The analyses found that web-based delivery was preferable from a provider perspective, but the health service and learner perspectives tended to favor face-to-face delivery. This well-conducted study highlights that it is essential to be clear from whose perspective value is to be measured.

Social relationships and learning

Most learners on HPED programs are also actively working and learning as educators in a clinical workplace and/or educational institution, with this context being an essential aspect of their development [6,10]. A key aspect of any workplace learning, including HPED, is both the role modeling of professional behaviors and the development of professional identity through social relationships [11–15]. Hence, social relationships may be intrinsically valuable to a learner on a HPED program. The importance of social relationships in the evaluation of the value of HPED programs from a learner perspective can be understood by the theoretical framework of social capital and social network analysis. The advantage of using a theoretical framework is that it provides a framework which can be utilized to understand an issue while facilitating transferability of findings to different situations [16].

Social capital

Social capital is a theory that considers the advantage an individual may obtain from their social relationships [17]. Hence, this theory is extremely useful in understanding the value a learner places on their social contacts. Within the literature, there are varying perspectives on social capital theory, which may be distilled into three different categories [18]:

1. An indirect access to resources, for example, information, advice, or support;
2. Social cohesion, relying on cooperation and trust;
3. “Bridging” capital, whereby an individual may act as a “bridge” connecting two otherwise separate nodes (groups or individuals) in the network, thus spanning a “structural hole” in the network.

Lin’s [17] network theory of social capital encompassed all three approaches to social capital, which he viewed from the perspective of the individual. Hence, Lin’s model is ideally suited to investigating the social capital of the learner. Lin [17] viewed the formation of social capital as occurring in two stages: first, the formation of a relationship with another individual(s), and second, with the subsequent mobilization of social capital from that relationship. This highlights the concept of potential capital, whereby an individual has yet to benefit from an existing relationship [19,20] and an important consideration when studying the benefits of ongoing connections from an education program.

Social network analysis

A social network consists of nodes which are linked together. These nodes may be individuals or group of individuals. The links between the nodes are termed ties. Social network analysis (SNA) entails the systematic mapping of relationships within a given network. It facilitates further understanding and measurement of social capital and is underpinned by the concept that the behavior and/or attitudes of an individual are shaped by their relationships [21]. Networks can be studied in their entirety (for example, all those working for a specific organization) or from the perspective of the individual (“ego”), the latter being termed an “ego-network” [18], which is the model used in the case study of an individual learner following the completion of a HPED program.

SNA is grounded in both sociological and mathematical theories, making it ideally suited to mixed methods studies [22]. Schematic network diagrams used in SNA simplify the complex social processes to facilitate the observation of patterns which, given only a narrative perspective, may not, otherwise, be apparent. Furthermore, the mathematical elements of SNA generate standardized measures, enabling comparisons between the groups and lending precision to data interpretation [22].

Social network analysis and evaluation of educational programs

Educational programs do not exist in a vacuum but are situated within the broader context of the network of relationships that surround both the educator and learner. There is a two-way interaction between the network of a learner and an educational program—i) a social network can impact, positively or negatively, on an educational outcome (for example, Vaughan [23]) and ii) an educational program can impact on the network of the learner (for example, Morzinski [24]). A growing awareness of these interactions has led to SNA increasingly being used as an evaluative tool in education [25–27], but it remains underused in healthcare professional's education [10,28,29]. There are a small number of SNA evaluations of HPED programs which examine new relationships formed by learners on an educational program (for example, Moses [30] and Buchwald [31]). However, these studies have taken a “whole network” approach and have not analyzed the new relationships in the context of the learners' existing networks. The following case study addresses this gap in the literature by siting the new relationships formed on the program within the learner's existing support network, hence analyzing value from the perspective of the learner. To the best of the authors' knowledge, this is the first time that this approach has been used in the evaluation of HPED programs.

Aim of the Case Study

This is an exploratory study, driven by the following research question:

What is the value of HPED in terms of the social capital of a graduate of an HPED program?

The aim of the study was, therefore, to understand the value of an HPED program in terms of the social capital of the graduate as it relates to their role as a clinical educator. Social capital is measured

and further understood through the analysis of the graduate's social network.

Case Study Method

The case

For the purposes of this case study, we elected to study a graduate of master's in clinical education. The number of institutions offering master's degrees in HPE has increased from single figures in the 1990s to 121 fifteen years later [32], and even though these figures continue to grow [33], research and evaluation into the value of such programs remain limited. The following illustrative case is that of a medical doctor, a mid-career consultant working in the National Health Service in UK after qualifying and training in a different country. He combined his clinical work with under- and postgraduate medical education roles. He completed a part-time master's level HPED program at Edge Hill University (EHU), UK, 4 years before the study, which took place in October 2018. An ethical approval for the study was given by the EHU Faculty of Health and Social Care Research Ethics Committee (ref FOHS209). Due to data protection legislation, the only participants eligible for recruitment were those who remained in personal contact with the program leader (one of the authors, CS). We developed a list of graduates who were up to 5 years from graduation, and these individuals were listed in reverse order of graduation date. Requests were sent to the first ten people on the list and P1 was the first to respond.

Case study design

The study utilized mixed methods SNA (MMSNA) and consisted of two stages: a self-report template (SRT) and a semi-structured interview performed over the telephone (see Appendices). The SRT contained contextual and demographic information to inform and shorten the interview. The interview involved constructing the participant's educational support network, which was bounded by the question: “Who are the people who support you in your role(s) as a medical educator?” Hence, the content of the network was determined by the participant. For each contact named, the interviewer explored the nature of support provided in addition to the origin of the relationship (for example, met through contact on the HPED program or met through clinical work role). The participant was also asked who knows whom within the network, as this information was required for the calculation of network outcome measures (see “*Analysis of case study*”).

data"). Both the stages of data collection gathered predominantly qualitative data, but some quantitative data were also collected – for example, duration of relationship and frequency of contact. For the purpose of clarity, contacts made through the HPED program are termed as “EHU contacts,” whereas contacts made under different circumstances are termed as “non EHU contacts.” The interviewer was not involved in the delivery of the HPED program. The study design was developed from extensive reading of the MMSNA literature and following consultation with experts in SNA.

Analysis of case study data

The visual and quantitative analyses were performed using UCINET, software for SNA (Version 6.665, Harvard, MA); the qualitative analysis was performed using template analysis [34], the initial template being based on Lin's network theory of social capital [17].

There is a plethora of different outcome measures in social network analysis. Those used in the illustrative case example were *constraint*, *degree*, *dyad*, *efficiency*, *redundancy*, and *structural holes*. Calculation of the latter three measures, all require knowledge of who knows whom within the network, providing a binary outcome of “knows” or “does not

know.” This information was entered into a spreadsheet on UCINET as 1 = “knows” and 0 = “does not know.” Based on this information, UCINET was used to draw out the network as shown in Figure 1 and perform the calculations as described below and presented in Tables 1 and 2. Where the term “ego” is used, it refers to the individual whose network is being studied. *Constraint* is a measure of the interconnectedness of the network. It is calculated for the network as a whole – the nearer the measure becomes to 1, the higher the constraint. *Degree* is the total number of nodes within a network connected to ego. A *dyad* is a pair of nodes connected by a tie. *Redundancy* is a measure of the proportion of nodes connected to a given node in the network. This is calculated for each node—the nearer the measure is to 1, the more “redundant” the tie is for ego—for example, information from the node in question may also be obtained from other nodes [35]. *Efficiency* is a whole network measure of the extent to which ego's ties are “non-redundant.” The more efficient a network is, the nearer the measure is to 1. A “structural hole” exists in a network where there is a lack of connection between the two nodes. An individual acting as “bridge” spanning a structural hole would be able to provide each connecting node with new or “non-redundant” information,

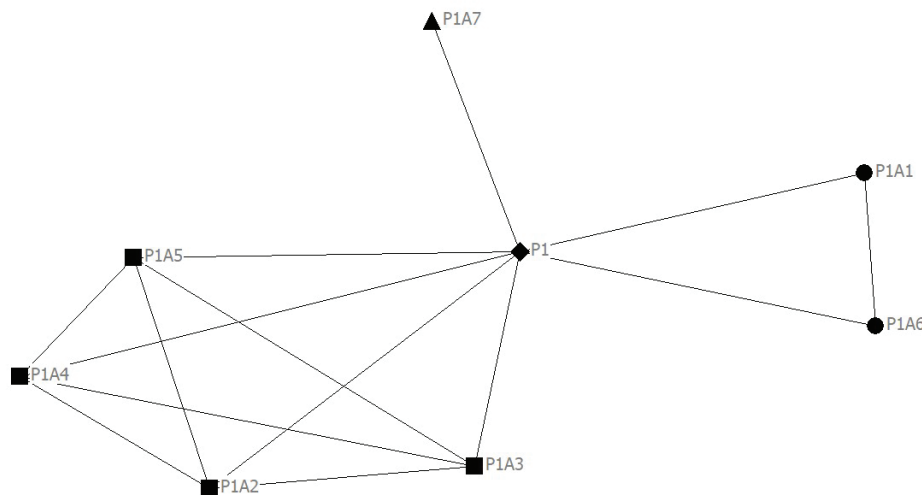


Figure 1. The educational support network of the participant (P1), graduate of a HPED program at EHU, UK, October 2018. P1 is represented by a diamond-shaped node. Other nodes are classified according to how they met the participant: square nodes met in P1's current clinical workplace; the triangular node met in P1's country of origin; circular nodes met when P1 was undertaking the master's at EHU. The figure complements the quantitative analysis of this network (presented in Tables 1 and 2) by clearly depicting three distinct groups within P1's network between which he could act as broker. The EHU contacts form one of these groups, and it can be seen how removal of these contacts would significantly impact on P1's access to heterogeneous resources and associated bargaining power. This is further illustrated in Figure 2.

potentially acting as a “broker” by playing one group off against another. A high constraint network has few such positions of “brokerage.” The figures given in the case study are the absolute number of structural holes within the network. The network measures were calculated with and without the EHU contacts to demonstrate the contribution these contacts made to P1’s network.

Results

The network is illustrated in Figure 1; a line between the two nodes indicates a “tie” and nodes are shaped according to the context, in which the relationship with ego began. The square nodes are P1’s day-to-day supports for his educational roles and are located within his place of clinical work. P1 describes these nodes as providing information and practical support in delivering his educational roles. These clinical non EHU contacts demonstrate a high level of constraint, with all members of the group being connected to one another. This is known as a “clique.” P1A7 (triangle) is an overseas-based former colleague with whom P1 maintains intermittent contact to keep abreast of job availability in his home country. The circular nodes are EHU contacts made through the HPED program: a peer (P1A1) and a member

of faculty (P1A6). Figures 1 and 2 show how the EHU contacts form a discrete group and another clique (P1, P1A1, and P1A6) were separated from the rest of P1’s network. Structural holes are clearly visible between the EHU clique and the rest of the network. Such separation would suggest that the EHU contacts would be able to provide resources not available elsewhere in the network, a notion which is supported by the qualitative data. P1 maintained intermittent contact with the peer for 12 months after his completion of the program to obtain information related to setting up an e-learning intervention. This advice was not available elsewhere in P1’s network. Faculty maintain contact with P1, providing sporadic notifications about jobs and further courses. Although P1 had not acted on the information provided by faculty, he valued them as a resource he could, and would, call on if required in the future. Being the only link between the EHU contacts and the rest of the network, P1 was in a position of brokerage, which was a source of potential capital for P1 as he had not assumed the role of “broker” at the time of interview. The impact of the HPED program is further understood through a quantitative analysis of the network data (Tables 1 and 2).

Table 1. Network measures for the support network of the participant, a graduate of a HPED program at EHU, UK, October 2018.

	Whole network calculations, including EHU contacts (contacts made through the HPED program)	Network calculations, not including EHU contacts
Degree	7	5
Efficiency	0.714	0.520
Constraint	0.362	0.530
Structural holes	28	8

Network measures were calculated with and without the contacts of P1 made through the masters at EHU. The findings support the concept that a master’s degree can help graduates to make structurally important additions to their social network, with EHU contacts contributing toward an increase in the number of structural holes, increased network efficiency, and a reduction in constraint. These findings support the notion that EHU contacts provide more diversity within the network. The network is visually represented in Figure 1 and further quantitative analysis is recorded in Table 2.

Table 2. Dyadic measures of redundancy for the educational support network of the participant, a graduate of a HPED program at Edge Hill University (EHU), UK, October 2018.

Mean dyadic redundancy: non EHU contacts (<i>range</i>)	0.344 (0–0.430)
Mean dyadic redundancy: EHU contacts (<i>dyadic redundancy figures identical for these contacts, therefore, no range provided</i>)	0.140

The dyadic measures of redundancy were performed on all dyads in P1’s network to facilitate understanding of the findings as represented in Table 1, which demonstrate EHU contacts contributing to an increase in structural holes and a reduction in constraint in the network. On average, the EHU contacts represent access to more heterogeneous, or less redundant, information than other contacts.

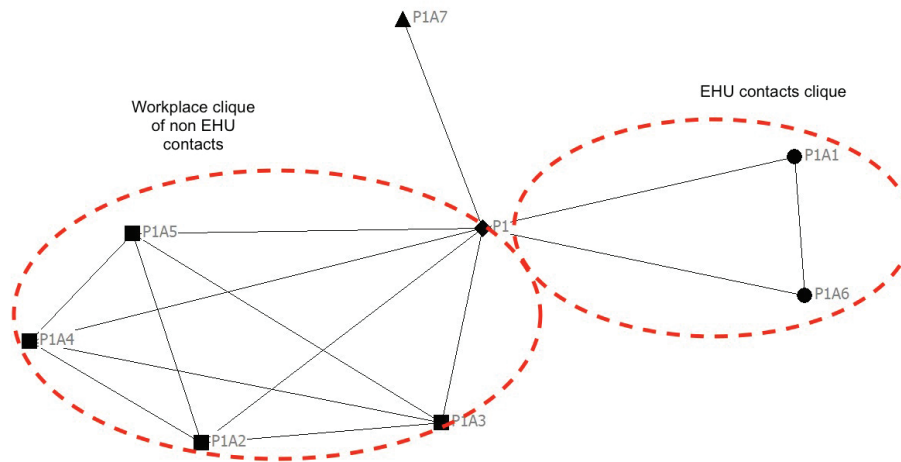


Figure 2. The educational support network of the participant (P1), graduate of a HPED program at EHU, UK, October 2018. The classification of the nodes is described in Figure 1. The dotted ellipses delineate the cliques of separate workplace and EHU contacts, indicating the opportunities for P1 to act as broker.

As shown in Table 1, it can be seen that the EHU contacts contribute to quantifiable differences in P1's network. The marked increase in the number of structural holes from 8 to 28 illustrates the distinct competitive advantage that the HPED program has provided in terms of access to "non-redundant" or new information, placing P1 in "brokerage" positions. This is supported by the lowering of constraint from 0.530 without the EHU contacts to 0.362 with these contacts within the network. The underlying calculation of this measure is complex but, in essence, the nearer the figure is to one the fewer opportunities for brokerage within the network. The efficiency figure indicates the impact that P1 obtains for each tie in the network, the ties being treated as equivalent. Therefore, this value was calculated with and without the EHU contacts, showing that with the EHU contacts, the efficiency of the network increases from 0.520 to 0.714. To add clarity to these findings, we calculated dyadic measures of redundancy, which can be considered as percentages (Table 2). On average, the dyadic redundancy of EHU contacts was lower (0.140) than for non EHU contacts (0.344). In other words, on average, only 14% of P1's network also has ties with the EHU contacts, whereas 34% have contact with P1's non EHU network ties. This supports the assertion that the increase in structural holes provided access to "non-redundant" resources.

Statistical analyses of significance were not appropriate for this single, illustrative case study.

Discussion

Using this innovative approach, we have been able to demonstrate important program outcomes that would not be detected by more traditional evaluative methods. Indeed, providers and funders may be unaware of such beneficial effects. The methodology has addressed the problem of understanding value, as the participant themselves decides who belongs to their support network. Hence, the participant is defining value. In other SNA evaluations of HPED programs, the value is predetermined by the researcher and the studies often use only quantitative data, missing out on the qualitative richness of our approach. For example, Buchwald and Dick [31] utilized quantitative SNA to evaluate the North American Career Development Program for health researchers. Their outcomes looked at measures of centrality within the network, collaborations, and academic output. While the study produced some interesting results, the lack of a qualitative egocentric approach means that we do not know if the learners on the program achieved *their* aims, as opposed to the aims of those running the program. Moses [30] conducted MMSNA on a North American healthcare professionals teaching scholars program. There were more connections between course participants after the course had completed, but these connections were not viewed within the context of the participant's own network. The full value of the new connections to the participants is, therefore, unclear.

The existing studies of master's level HPED programs demonstrate the importance of social interactions on HPED programs. Sethi et al. [12] have demonstrated that social interactions are important for identity formation, a finding echoed by Aitken et al. [36] who observed that new connections formed during the program were reported by participants to be valuable in helping learning. While highlighting the important role of the social network in HPED programs, neither of these studies utilized social network analysis—reports of network connections were merely anecdotal and it is, therefore, difficult to transfer the findings to other settings. The case study, in this article, addressed this gap in the literature by providing a novel methodology to rigorously analyze social networks in a manner that is transferrable to other situations. MMSNA helps us to understand more precisely both how the network of the participant changed following an HPED program and how the participant benefited from these changes. In our case study, we found that the new contacts gained from the program increased the number of structural holes and reduced network constraint. These changes represent an increase in positions of “brokerage” or bargaining. Much of the existing work in this area is based within the business literature (for example, Burt [37]), but recent research in healthcare management has highlighted the importance of brokers in implementing a change in practice [38]. In this present study, brokerage was not used by the participant as a bargaining tool but merely a means of accessing specialized knowledge unavailable elsewhere in the network, something which was only made apparent by the additional collection of qualitative data. Such use of the EHU contacts has, therefore, more in common with Granovetter's “strength of weak ties”[39]. Granovetter's seminal work [40] demonstrated that infrequent contacts provided information about job availability, just as with P1's ongoing contact with EHU faculty – a source of potential capital for P1. The combination of structural holes and a closed work-based network may be advantageous to P1 in allowing knowledge transfer between the groups, as seen in SNA studies in healthcare settings [41,42]. Hence, the use of MMSNA reveals potential benefits for the future, in addition to those already acquired. Moreover, the underpinning theoretical framework facilitates transferability to other programs, a necessity considering the contextual nature of “value”. This being a *post hoc* study, we were able to establish that the

impact of the HPED program extends beyond graduation, P1 having ongoing contact with faculty, 4 years after he completed the course.

Implications for future research

Following the success of the above exploratory case study, the authors are in the process of conducting a larger study, with the same methodology. A case series from one HPED program with cross-case analysis will further the understanding of how and why healthcare professional educators maintain relationships which they have formed in an HPED program. Qualitative themes can be developed in relation to the changes to a participant's social capital following an educational intervention. The qualitative data may be further analyzed using Qualitative Comparative Analysis (QCA), a relatively new technique, which provides a systematic, non-statistical approach to the analysis of very small groups of cases in a series of case studies. The technique develops a series of binary quantitative variables from the qualitative data and can identify common themes across the cases if there is a relationship between the variables [43]. For example, QCA may be used to understand the circumstances under which new relationships form and are maintained. Such information would be useful to inform university curriculum strategies and teaching and learning policies. At present, EHU's policies do not make any reference to fostering relationships between peers during their programs and do not emphasize to staff the potential mutual benefits of maintaining contact with alumni. A brief review of available educational strategies from institutions offering similar HPED programs demonstrates that Edge Hill is not the only university whose policies fall short in this area. Hence, once the results of the main study are available, they should be able to inform university policies to mold the teaching and learning environment in ways that will encourage peer-peer and peer-faculty relationships to flourish after graduation. The benefits reaped from such relationships may then be channeled into the clinical learning environment.

On a technical note, for those unfamiliar with social network analysis, different software packages are available to download online. YouTube tutorials are available on their use. However, for the development of this study, the authors were fortunate to benefit from the advice of specialists in SNA and the lead author (CO) attended a week-long course on SNA and UCINET.

Limitations

This case study was intended as an exploratory study and has some limitations. There is selection bias, with potential participants only being contactable through the program leader. In addition, the retrospective nature of the study introduces the problem of recall bias. These issues would readily be overcome by utilizing the same method for a prospective study commencing at the start of a HPED program. In terms of the approach, SNA is effectively a case study approach. As such, it provides a richness of data. However, in a small field, this is accompanied by difficulties in providing true anonymity, as individuals who know those discussed in the case may be able to use their own knowledge to fill in the gaps to identify participants. Hence, when publishing such data, it may be necessary to change or withhold small details to protect anonymity, providing that this does not adversely affect the data analysis.

Conclusion

We have presented a new evaluative MMSNA methodology which, to the best of the authors' knowledge, has not been used elsewhere in HPED. This method is demonstrably both feasible and effective. The results from just one case study have already uncovered benefits not observed in other analyses of HPED masters' level programs. The use of mixed methods has been important in both revealing structural network changes and understanding the value of those changes to the participant.

A critical aspect of the study is that the content of the support network was decided by the participant. By extension, the value of the HPED program is viewed from the perspective of the participant and not the provider. Given the contextual nature of value, this is of crucial importance.

Social network analysis produces outcome measures which are standardized and repeatable. We have, therefore, developed a method whereby value can be measured in a way that is transferable to other situations. This is a significant methodological advance in an underdeveloped field.

We have indicated how we are currently building on this work with a case series. The results from this series will be subject to cross-case analysis and may be used to inform future university teaching and learning policies, with subsequent benefits to the clinical learning environment.

In addition to demonstrating a new method of evaluation, we also wish to increase the awareness

of social capital and SNA as useful components of the evaluative toolkit. The complexity of HPED programs is such that a multifaceted approach to evaluation is required. Our case study illustrates that MMSNA can uncover how HPED programs impact on the participant in their clinical educational environment in addition to the way in which such programs may facilitate ongoing development of the participant long after they have completed the program.

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Conflict of interest

The authors declare no financial conflict of interest in the study.

Ethical approval

Ethical approval for the study was given by the Edge Hill University Faculty of Health and Social Care Research Ethics Committee (ref FOHS209). The study has, therefore, been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki. The study participant provided written, informed consent prior to their inclusion in the study.

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Appendices

Appendix 1. Self-report template

Thank you for completing this document. You will have read about the study on the Participant Information Sheet, dated 11.10.18 v4. Prior to sending the completed document back to the researcher, please also complete the consent form which you have been sent with this document.

If you have any questions, please contact the researcher:

Dr Charlotte O’Callaghan, Graduate Teaching Assistant, Faculty of Health & Medicine Social Care, Edge Hill University, St Helens Road, Ormskirk, L39 4QP

Email: ocallagc@edgehill.ac.uk

1. Please note in the table below whether you have a PGDip or MA in Clinical Education from Edge Hill University. Please also state the year that you obtained your qualification. If you have not yet completed the course, please provide an estimated date of completion.

Qualification	Year of qualification or estimated date of completion
PGDip	Yes/No
MA	Yes/No

2. This question asks about your current job roles. Please list clinical and educational roles separately in the table below. For example, “Consultant in Anesthesia” and “Educational Supervisor” would be recorded in different boxes. Please also state how long you have been in the role – precise dates are not required; the number of months or years is sufficient.

Current job role(s)	Length of time in role (approximate)

3. In which year did you obtain full medical registration?
.....
.....
4. Was your undergraduate training in the UK? Yes/No

If no, which country?

.....
.....

5. Was your postgraduate medical training in the UK? Yes/No

If no, which country?

.....
.....

6. Why did you choose to study for a Postgraduate Diploma (PGDip) or Master’s (MA) in Clinical Education?

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.....

7. Please list up to five benefits you feel the MA/PGDip has had on your work as a medical educator:

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8. Please list up to five disadvantages of undertaking the MA/PGDip in Clinical Education:

.....
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.....
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.....
.....

9. Gender:

Please describe your gender:

.....
.....

Thank you for completing this document

Appendix 2. Semi-structured interview

Domain 1: information from self-reported template about educational role to contextualize network discussion

Thank you for completing the Word document. I notice that your educational role(s) involve X. Could you tell me a little about your experience in this/these role(s)? Probe: e.g., what factors make your job easier/harder?

Domain 2: drawing out the social network

- a. "Who are the people who support you in your role as a medical educator?"
- b. How long have you known (each alter)?
- c. How did you get to know (each alter)?
- d. How frequently are you in touch with (each alter)?
- e. How do you contact (each alter)?
- f. Please draw a line between the individuals in your network whom you perceive to be in contact with one another.

Domain 3: support provided

- a. The participant will be asked what support is provided by each of their alters.
- b. Is anything expected of you in return for this support? Probe: do you provide support for them?

Domain 3: homophily and heterophily

- a. What do you feel you have in common with these people?

Probe: e.g., do you share common activities outside your work role(s), same gender, clinical specialty, geographical area? Do they have a qualification in clinical education of which you are aware?

- b. In what ways do you feel you may be different from these people?

Probe: e.g., work in a different clinical environment, they are more experienced/less experienced.

Domain 4: difficulties

- a. Is there any support you would like to receive, but which you do not at present? Probe: e.g., Why do you think you do not get this support? Do you have any plans for how you may access it?
- b. Do you provide support for anyone who does not provide support for you? Probe: e.g., Why do you provide them with support? Do you anticipate they may be able to provide support to you in the future?

Domain 5: General questions about the role of medical educator and the impact of the MA/PGDip to contextualize the network

- a. On the Word document, you mentioned X positive and X negative aspects of undertaking the MA/PGDip. Could we discuss this further, please?
- b. How influential have these positive aspects been on your work as a medical educator in comparison with the support you receive from the social network we have just discussed?