



Review article

Clinical research leadership—“A blueprint”

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ARTICLE INFO

Keywords:

Leadership
Models of academia
Clinical research
Quality

ABSTRACT

The principles of leadership in academic research, reflect those of life in general and differ only by circumstance. A great leader is one who inspires and energizes, motivating and empowering the whole team to achieve. They articulate a vision, establish direction, clarify the big picture and set clear strategies in a positive culture. A great leader needs to align and connect people by fostering excellent communication channels, gaining commitment and building teams and coalitions.

1. Introduction

Within academia, programmes of research traditionally take place in higher education institutions such as universities, developing strong leaders in the field. Such institutions utilise an ongoing, self-regulated, peer review process to measure and monitor the quality and quantity of output, which typically involves the analysis of publication and citation data. Such bibliometric criteria evaluate historic performance and have become the gold standard for governments, funding agencies (such as research councils, charitable trusts) and universities themselves in determining the strategic allocation of grants [1].

2. Models of academia

Several models exist for the organisation and governance of universities [2,3]. The ‘Republic of Scholars’ model is derived from the original guilds which exist without reference to outside influence. Institutions following this model may be described as being independent and risk taking, they favour and promote academic excellence, exhibit creativity that is rapid but not predictable, are flexible but random, with the responsibility for the programme relying ultimately on these individuals. This elitist model requires individual leadership and collegial decision making to provide strategic direction and day to day management. It is this very leadership that shapes the universities, defines their characteristics and ensures their survival. Such individual leaders are considered credible, to have an innate understanding of university values and to personify quality. These values are a message or signal to faculty and external bodies that the leader appreciates scholarly values. Furthermore, this collegial approach is also an indicator of quality as it necessarily relies upon discussion and dialogue. The outcome of the combination of individual leadership and collegial

decision making is that quality is always considered as a priority and that scientific rigour and peer review have an impact. The downside of this model can be institutional paralysis, as the collegiate system discourages strategic development in favour of the ‘status quo’. Furthermore, promotion and career development opportunities lie within groups of such institutions and an appointment on academic merit is not necessarily accompanied by managerial or administrative excellence.

In contrast, universities based on a ‘Stakeholder’ model are dependent on integration with society, they facilitate research at all levels of quality, exhibit modern levels of governance and bureaucracy, and long-term strategy is based on consensus. Stakeholder institutions are a reflection of society itself, with a representative cross section of the population being both employed and in education, often as a result of central government policy. The interests of each stakeholder, therefore, have to be considered when the issue of research quality and approach is considered.

3. Evaluating output

High quality research may be defined as research that:

- Withstands the scrutiny of highly recognised peers within the field
- Has a substantial impact on the development of the research field
- Provides a useful direct or indirect contribution to society in the short or long term.

A limitation of this definition is that research initially considered to be of low quality may lead to further value, interest or impact subsequently and vice versa. It follows that a prevailing challenge is how to measure high quality research in a reliable and consistent way that

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minimises bias.

The current arbiter of assessment is and remains peer review. Peer review has widespread, deep and strong support within the research community [4]. As a system it represents a collegial, versatile and flexible approach that draws on the experiences of the reviewers to process complex qualitative concepts that cannot be assessed by pre-determined quantitative goals. It facilitates exchange of information and ideas bidirectionally as it allows reviewers to influence the direction or clarity of research by providing constructive feedback. Peer review also serves as a platform of influence and impact, to encourage collaboration. Its limitations include self-defining and protectionist tendencies dependent on the prevailing common view, which may lead to limited acceptance of innovation, conservative results and prejudice. The overall impact is that the published body of works becomes biased. Despite the fact that peer review can lead to delays, may not always exclude fraud, may lead to conservatism and bias as well as placing a burden on reviewers, there seems to be no practicable alternative [5]. Indeed, it is thought that the problems that arise are related to the peer review process rather than the principle of peer review.

A further method of evaluating academic output is to refer to bibliometric data, which is defined as the quantitative analysis of publications [1]. It extracts data from publications and is a method of studying by proxy, the research contained in research publications. Bibliometry can be utilised in many different levels and analytical techniques to evaluate research output. Common examples occur at the level of a published paper (e.g. number of citations, systematic review), individuals or groups, or the very journals which carry the publication (e.g. impact factor). The rationale for such an approach is that bibliometrics is considered to be more objective and correlates well with peer review [1]. It is more practical as the volume of published research is increasing. Whilst bibliometry may be considered as an alternative to peer review, as a gold standard, it best represents an objective supplement to the peer review process.

4. Features of high-quality research

The characteristics of successful research environments differ between institutions, but are characterised by publishing international high impact research, attracting external funding, being responsible for major scientific breakthrough, establishing and maintaining a high-skill and high-will team, and excellent peer reputation. This environment is created by conditions where research leaders or teams are free to define their research agenda within their own area of expertise, to be able to communicate and collaborate with colleagues as well as have access to funding and facilities.

Research groups with high quality outputs often exhibit the following traits - adapted from Carlsson et al. [6]:

- Small, focused and self-governing
- A dedicated research active leader considered to be 'primus/prima inter pares', (first among equals) who conveys a clear vision
- An engaging social atmosphere that fosters the opportunity to interact and discuss and develop mutuality and openness
- Junior researchers with complementary competencies who are brought into the group, fostered, but also encouraged to leave creating a strategic transfer that leads to strengthened external partnerships
- Embedded in a larger institution with good infrastructure, facility and meeting points to facilitate interaction with researchers from other disciplines
- Relaxed and deregulated external influences on the institution from government and society to allow for autonomy, flexibility and innovation
- Generous and long-term funding levels which encourages innovation and the opportunity to meet the common goals set out by the group lead

- Time set aside to source external funding as well as being minimised by professional administrative support
- Research is linked to teaching as a mutually beneficial activity

5. Leadership and research success

Leaders with a proven track record of research success typically exhibit specific characteristics with regards to strategy, funding, environment and recruitment [7]. They have a strategic vision for focused research with cross collaboration to other disciplines. They are able to obtain funding and develop a creative, productive environment. They also are able to attract and recruit personnel who contribute positively to the process. Typically, a leader will pursue a strategy unwaveringly, minimise bureaucracy and be prepared to make difficult decisions swiftly. They are accessible, understand the value of correct administration and provide management training to young researchers. This needs to be set in a backdrop away from the research facility such as a restaurant, where social and professional interaction can take place. Indeed, institutions that appoint proven leaders improve their overall research output as a consequence [8].

The establishment and maintenance of a good team is achieved by incentivising, recruitment of appropriate personnel from without and recognising talent within. The establishment of common goals or foci is a prerequisite of successful research groups with all members requiring purpose. An environment that cultivates innovation through individuality and successful outcomes is achieved by teamwork and meaningful collaboration. New group members are recruited carefully so that they complement the existing group dynamics. Groups that produce high quality research visit other groups, receive visiting researchers and recruit from outside. They are characterised by movement of personnel in and out of the group by encouraging young researchers to move on once their studies are complete [9], thus avoiding stasis. When a protégé leaves to pursue career opportunities this widens the sphere of credibility of the founding group, increasing collaborative opportunity and global influence. Attracting staff and students, to fill the resulting gaps and maintain the vitality of the research team is often achieved as a result of the visibility of the leader.

Good academic leaders are recognised by their peers, actively involved in their research and invited speakers at local, national and international events and conferences. In these settings they are available to younger researchers or early stage professionals from home or abroad who are interested in pursuing research. Thus, there is an opportunity to meet prospective staff/students in an informal setting prior to any formal application for work/study and invite individuals who express an interest in playing an active role in the group's research be it as a student or a collaborator to visit the team. The composition of the research group is influential, with successful teams containing a variety of knowledge and skills complimented by social interaction and daily attendance [10]. This generates a sense of trust which in turn encourages a risk taking and creative culture. The collaborative element is further fostered [11] at a professional level with seminars, research presentations and conferences.

6. Size

Interestingly, successful groups tend to be small, consisting of 6–8 researchers in total [9], which ensures that the academic leader is able to remain active in the research whilst fostering collaboration within the group. In turn, the small numbers allow for mentorship, intellectual exchange and flexibility. Groups that grow larger by virtue of their success tend to lose leader involvement, create bureaucratic hierarchy and develop institutionalised routine which ultimately leads to disbanding because of creative constraint [7]. As a consequence, larger research groups need to overcome difficulties in communication and the delegation of responsibility for recruitment together with securing funding, to be able to survive. The team needs to be regularly assessed

by the leader, looking for and nurturing capability, skills and knowledge, to map to the output needs of the group, to evolve a sustainable strategy that is flexible and forward thinking in line with the current research pathways. Successful research teams therefore tend to be autonomous but embedded within a larger institutional complex that provides facility, technical resources, and opportunity for intellectual interaction within the group and with other groups that have common or complementary knowledge or skills [9].

7. Funding

As well as attracting and maintaining a good, vibrant team, an effective leader must be able to attract funding. The visibility of the leader can also be important here, particularly when it comes to gaining industrial sponsorship. Speaking at conferences opens the door for leaders to network and talk to industry leads to explore areas of mutual interest which may in time generate group funding. The leader must be able to negotiate to align company research needs with those of the group. There is increasing collaboration and symbiosis between university and industrial sponsors in which the research is conducted and supported within universities instead of within the companies - so called 'in house' research [7]. This is a very positive and imperative step forwards, endorsed by industry as the research is undertaken by a third party with greater transparency, with studies being conducted to a high level of governance according to Good Clinical Practice [12,13], with a clear audit trail, and published on a clinical trials data base.

Non-industrial funding comes from a variety of sources, and it is important to be aware of funding calls and deadlines as early as possible. Universities generally have a mechanism of disseminating funding calls to staff, but they are many and varied, thus the skill lies in picking those that are appropriate to the group. An effective group leader will become aware of relevant funding calls through their network of collaborators, university mechanisms of dissemination and team members dedicated to reviewing funding sources for a specific research area. Once identified, the requirements of the funding call in terms of, amongst other factors, feasibility, collaborators, patients, public involvement and availability of data must be reviewed. Only those for which all the pieces fall into place should be prioritized, given the competitive nature of funding calls. The leader will ensure they and their team make full use of university resources and collaborator experiences when putting their application together, obtaining peer feedback, wherever possible, and any other available review prior to submission.

8. Academic leadership

It is clear that good academic leadership that supports the concept of 'primus/prima inter pares' is critical for the development and sustainment of a successful research environment. Such is the paucity of high impact publications in this aspect of research, the authors have developed an empirical opinion adapted from the 'Leadership Qualities Framework [14]' to address this issue and stimulate further research in this area.

9. Vision

It may be perceived that there are many facets to what contributes to good leadership. Indeed, leadership itself may be applied to personnel at all levels within a research group. The overriding facet of a true leader is that they have strategic vision which they are able to communicate to their research group and to the institution within which they are embedded and that, furthermore, their own personal values are an embodiment of that vision.

Leaders need to be able to broadly view and analyse the full range of factors that may impact the research group and to be able to evaluate alternative scenarios for the future. The vision itself needs to be bold,

innovative and correctly reflect the core values of research such as professionalism, training/accreditation and integrity. It also needs to be communicated with clarity, enthusiasm and without ambiguity to group members as well as bodies external to the research group who are likely to be impacted by it. It needs to engage, inspire and encourage ownership so that challenges may be collectively met and addressed. Fundamentally, a leader within a successful research group embodies the vision by acting as a role model and personally reflecting the inherent values and principles. Leaders challenge behaviours that are not consistent with the vision and replace them with ones that are, whilst at the same time using personal credibility to act as an advocate.

10. Strategy

A vision can only be delivered if it is strategically framed, developed, implemented and embedded. Framing a strategy involves the identification of best practice and the identification of strategic options that will deliver a vision. Developing the strategy allows a research group to be integrated within a larger organisation by engaging with stakeholders to ensure coherence and continuity. Implementation is a critical element in that it should ensure that strategic plans are converted into practical operational plans that allow for risk analysis, evaluation techniques and accountability. Finally, the strategy needs to be embedded so that it becomes cultural, engenders a climate of transparency and trust and where open discussion is encouraged.

11. Personal qualities

Effective leaders in research are able to deliver high quality research by drawing upon their personal values, strengths and abilities. An essential component is the development of self-awareness together with an understanding of how this may differ from other members of the group. This should be accompanied by an appreciation of the personal strengths and weaknesses of the team. Good leaders have the confidence to receive, analyse and act upon feedback from various sources, and must always remember to listen. At a personal level, leaders are proactive in their own professional development and take every opportunity to continuously adapt and learn. As well as delivering on their own obligations, leaders provide opportunity to provide direction and further nurture the less experienced researchers as part of their continuing development. Delegation is an attribute that comes to some more easily than others, however once realised facilitates much greater yield and success for all. Additional personal values of excellent leaders include integrity, ethics, as well as an appreciation of the inherent values of the institute where they work. They have the ability to ameliorate the impact of their own emotions on their communication and interaction with others in their group. As a consequence, they consistently meet their commitments and responsibilities, which are naturally set to a high standard. They recognise the need for flexibility rather than rigidity for group members to be able to deliver on their objectives and they plan their own workload accordingly.

12. Teamwork

Beyond the personal level, effective leaders usually display an ability to work well with others. This may be perceived at group level, between research groups and with external bodies that could conceivably impact on the quality and direction of research. At the group level, a leader is capable of identifying and exploiting opportunity, creating circumstance which brings individuals from differing backgrounds together and promotes sharing of information and resources. Once established, relationships require maintenance. Continued networking requires a leader to act as a positive role model with good communication skills, as effective leadership is still largely a matter of good communication. Leaders need to be able to connect with everyone. Further, it is important to listen and maintain the trust and

support of working colleagues. At a practical level, this often means providing opportunity and setting challenge as well as adopting strategies to minimise conflict that has the potential to upset the research objectives.

13. Setting direction

Many models of leadership include direction-setting practices, these are for example shared goals or developing a vision. Identifying the need for change involves fully understanding the culture and environment prior to the change taking place. The successful academic leader needs to be aware of political, social and economic policies, and be able to respond and interpret new legislation and research policies such as Good Clinical Practice [12,13] and the Human Tissue Act [15] in the UK, working with knowledge to best practice with peer reviewed evidence. This necessitates a team approach to keep abreast of a range of guidance which is regularly reviewed due to moving targets. Decisions need to be made in a timely, consistent, manner with accountability evaluated, in line with the values and priorities of the establishment.

14. Managing

Leaders must manage their team, holding themselves up as examples and being accountable for the service and research outcomes. A 360-feedback exercise is a valuable tool to employ both for the leader and the team, alongside appraisal for planning and allocation of resources. Leaders are of course frequently tasked with taking action to improve performance, which should be undertaken professionally and positively, this also being integral for the benefit of the whole team.

15. Improving

A leader lives to improve and innovate, creating synergy in an inspirational environment. They need to model and promote change. The importance of equality and equal opportunities is on the agenda of leaders in academic research, with Athena SWAN established in 2005 [16] to “encourage and recognize commitment to advancing the careers of women in science, technology, maths and medicine employment in higher education and research.” Whilst much has been achieved there is still a long way to go, both in the UK and Europe, and leaders in academia need to maintain the proactive approach to ensure this is rectified.

16. Conclusion

Leadership in clinical research is similar to that required in other aspects of dental academia. Leadership skills should be developed and cultivated from an early career stage. Those that succeed learn the art, practice the art and demonstrate the art of leadership.

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