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Curriculum Development of Human Clinical Trials for the Next Generation of PhD Students and Early Career Researchers in the Medical, Science, Pharmacy and Health Professions

CHAPTER 10

LEADERSHIP FOR 21ST CENTURY TRIALISTS

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Time required to complete this chapter

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| Core content: | 4h 00m |
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Total time: **6h 30m**



1 Introduction

*„Before you are a leader, success is all about growing yourself.
When you become a leader, success is all about growing others.”*

Jack Welch, former CEO of General Electric

As one of the great leaders and innovators of our times, Steve Jobs stated, *“ideas are worth nothing unless executed.”* We cannot but agree with Jobs’ statement. However, we believe that it needs to be amended: the successful execution of an idea requires a well-oiled team, and for a team to reach its creative potential, visionary leadership and effective management are essential. (For an explanation of the difference between the two latter notions, see 3.1) The same key tenet goes for research and innovation: while scientific quality is essential to complete a research project, its success, visibility, and sustainability hinge just as much on researchers’ leadership and managerial qualities and skills that allow them to fund the project, lead and manage their team, and finally, to communicate about it.

Hence, this chapter aims to allow students to reflect on and develop those skills, using a people-centred, team management and teamwork focused approach. As such, it completes two other, more technical skill centred chapters: chapter 3¹ focuses on the practicalities of trial management, whereas the interdisciplinary chapter 11² explores different facets of scientific communication.

Aware of the striking hiatus in interdisciplinary/transferable skill-based training in biomedical/health education that can be defined as (biomedical) humanities, we have divided the chapter into two distinctive parts: subchapters 2 and 3 aim to provide students with a general overview of key notions in leadership and management, whereas subchapter 4 places those notions into the biomedical research and innovation context. Each subchapter is completed by quizzes testing students’ capacity to interpret theoretical notions, and interactive discussion boards and case-based tasks to allow them to reflect on leadership and management practices. Our hope is that this chapter will help them embark upon a journey of self-growth, which will allow them, later, to become successful 21st century leaders in research and innovation with the capacity of making others and society grow.

2 The key notions in leadership

2.1 Leadership styles and their pros and cons (from the autocratic to servant leadership)

2.1.1 What is leadership?

In a review of leadership research, Stogdill (1974, p.259) concluded that there are *“almost as many definitions of leadership as there are persons who have attempted to define the concept”*³. Given the theoretical complexity and plasticity of the term, and the hands-on,

¹ CONSCIOUS: Chapter 3, Trial Management; <http://consciousii.novaims.unl.pt/course/view.php?id=26>

² CONSCIOUS: Chapter 11, Scientific Communication; <http://consciousii.novaims.unl.pt/course/view.php?id=30>

³ Stogdill, R.M. (1974) *Handbook of Leadership: A survey of theory and research*. New York: Free Press.

concrete orientation of the chapter, for the purposes of this chapter, we'll rely on a simple, commonly accepted definition.

The Cambridge Dictionary⁴ defines the notion of leadership around three semantic fields:

- a. **Status/position** – *who we are and how we use our power within a team vis-à-vis other team members.* According to this, *leadership is the position or fact of being a leader.* As such, we can be for example in a corporate or executive leadership position with a certain *leadership style.*
- b. **Quality/skills** – *with what we lead, i.e., our set of characteristics that make us into a good (or bad) leader.* In this context, the focus is on the skills we possess that allow us to lead a team.
- c. **Space/Competition** – *where we lead.* In this context, leadership is the capacity of a company/product to be more *successful* than their competitors. This is a comparative notion, as one can only be successful in relation to others, and the approach itself is related to the field of marketing.

Our chapter will focus on two of the three former sides of leadership: *status and style and the qualities of a good leader*, as our key objective is to provide students with the keys to becoming efficient team leaders in the 21st century. However, it is noteworthy, that more theoretically complex, less dualistic, and individual-focused approaches exist. We'll just mention one here: that by Northouse⁵ who states that *leadership is a process whereby an individual influences a group of individuals to achieve a common goal.* This view is more in sync, to our minds, with a 21st century approach in that it adopts a (1) *procedural* view – an understanding that leadership is context-dependent, action-oriented and non-static -, that it describes leadership as being (2) *group dynamic-related* defined by the ebbs and flows between an individual and the group, that instead of power, it uses the term (3) *influence* and that it puts leadership into the context of (4) *thriving for objectives accepted by the group*, i.e. it provides a goal/result-oriented approach.

While this chapter does not allow for more theoretical digressions, we suggest students adopt such *process-, group- and goal-oriented leadership* mindset, and approach the role of the leader as an *influencer* rather than that of a tyrant holding power over others. Our chapters will do the same while dealing with leadership styles and qualities of a leader.

For those who take an interest in having a global overview of the multifaceted notion and the theoretical background of leadership, we suggest reading the following comprehensive report on the nature of leadership entitled [What is leadership?](#)⁶

Finally, for those of you who are looking for a humanistic, inspirational, self-betterment and purpose-oriented definition of leadership, here is a video by Prof. Omid Aschari, from the University of Saint Gallen: "[What is the true meaning of leadership?](#)"⁷

⁴ <https://dictionary.cambridge.org/dictionary/english/leadership>

⁵ Northouse, P.G. (2004) *Leadership: Theory and Practice (3rd Edition)*. London: Sage Publications Ltd.

⁶ R. Bolden, *What is leadership?* University of Exeter, Centre for Leadership studies, 2024.

⁷ <https://www.youtube.com/watch?v=ggR9RMuaAs0>

2.1.2 Leadership styles and their pros and cons

Leadership style is a behavioural notion that describes *how a person behaves when directing, guiding, motivating, and managing groups of people*. The notion is not to be confounded with management techniques, as leadership does not equal management. (See below, subchapters 2.3 and 2.4).

Before reading this subchapter, here are some key paradigms to keep in mind:

- leadership and leadership styles are defined *outside the realm of morality*: no moral judgement can or should be attached to them. They are defined by *efficacy*. The only code to respect is “*primum non nocere*” – do no harm, whether this concerns group members’ mental and physical health or achieving goals.
- there is *no such thing* as an ultimately perfect, “good” leadership style: the right leadership style to adopt comes down to the (1) socio-historic, (2) psychodynamic (personalities and competencies of the leader and team members involved) and (3) situational (goal) context. For example: a 21st century group of creative people might prove to be more successful as a group with a democratic, participatory approach that draws on everyone’s skills and personal qualities, whereas in the perilous situation of a medical emergency where immediate action, quick decision-making and precise execution are required, an autocratic leadership style can be more fruitful. As a result, while one might have one’s own natural tendency to opt for a certain leadership style depending on one’s personality, in fact, “good/efficient” leadership comes down to *adapting to a given sociohistorical, psychodynamic, and situational context*.

Without the pretence of being comprehensive, we are going to discuss the following basic leadership styles in this subchapter: (1) *autocratic* (2) *democratic* and (3) *delegative* identified in Kurt Lewin’s revolutionary experimental study.⁸ This will be followed by an analysis of leadership styles the understanding of which have emerged later, such as: (4) *transformational* (5) *transactional* (6) *situational* and (7) *servant* leadership.

(1) Autocratic / Authoritarian leadership style

In authoritarian leadership, decision-making centres around the leader and obtaining results: it is a solely task-oriented form of leading. Authoritarian leaders, also known as autocratic leaders, provide clear expectations for *what* needs to be done, *when* it should be done, and *how* it should be done. This style of leadership is strongly focused on both command by the leader and control of the followers. There is also a clear division between the leader and the members. Authoritarian leaders make decisions independently, with little or no input from the rest of the group. There is very little focus on group members as people.

The pros: In their book, *The Bass Handbook of Leadership: Theory, Research, and Managerial Applications*⁹, Bass and Bass note that authoritarian leadership is often presented solely in negative, often disapproving, terms.

⁸ Lewin, Kurt, Patterns of aggressive behaviour in experimentally created social climates. *Journal of Social Psychology*, 10:2 (1939:May) p.271 Accessed: https://tu-dresden.de/mn/psychologie/ipep/lehrlern/ressourcen/dateien/lehre/lehramt/lehrveranstaltungen/Lehrer_Schueler_Interaktion_SS_2011/Lewin_1939_original.pdf?lang=en

⁹ Bass BM. *The Bass Handbook of Leadership: Theory, Research, and Managerial Applications*. 4th Ed. Simon & Schuster; 2009.

However, there are potential positives to stressing rules, expecting obedience, and taking responsibility. It can be effective and beneficial in cases where followers need a great deal of direction and where rules and standards must be followed to the letter, where decisions need to be made quickly and workflows streamlined rapidly. Another often overlooked benefit of the authoritarian style is the ability to maintain a sense of order.

The cons: Researchers found that decision-making was less creative under authoritarian leadership, that it can lead to frustration and fear, which in turn can paralyze the group/organization, hence leading to a breakdown of communication and missed opportunities, not to mention threatening group members' mental health. Lewin also concluded that it is harder to move from an authoritarian style to a democratic style than vice versa. Abuse of this method is usually viewed as controlling, bossy, and dictatorial.¹⁰

For more on autocratic leadership, read the following article: ["What Is Autocratic Leadership?"](#)¹¹

(2) The democratic / participative leadership style

Lewin considered this leadership style as being the most efficient. Here, the gap between the leader and the group members is narrowed, the group structure is less hierarchical, leaders involve members in the decision-making and creative processes, even though they retain the final say for themselves. The reason why Lewin valued this style is that this leadership style is both task- and people-oriented.

The pros: the democratic leadership style keeps group members' motivation and engagement at a high level, though providing them with a sense of ownership, sense of self-worth and commitment: they feel valued and believe in the common goal. Another advantage research has found is that while under democratic leadership, *quantitative* productivity levels might be somewhat lower than under an authoritarian one, *qualitative* output and creativity tend to soar.

The cons: Processes may take longer with this kind of leadership, given the less organized nature of processes, which might lead to a sense of chaos along the creative process.

For more on the pros and cons of democratic leadership and when to use it, read the following article: ["Is Democratic Leadership the Best Style of Leadership?"](#).¹²

(3) Delegative/laissez-faire leadership

In this kind of hands-off leadership, the goal setting, problem-solving and decision-making process is left to the self-directing group, with little or no guidance coming from the leader. This can be a useful way of functioning when one works with highly qualified, senior, and creative experts who thrive in a non-hierarchical environment and are ready to take responsibility without external control. This requires a highly driven, well-oiled team with great group dynamics, and members who have clearly identified and certified sets of skills. This kind of

¹⁰ Adapted from: <https://www.verywellmind.com/leadership-styles-2795312#citation-2>

¹¹ <https://www.verywellmind.com/what-is-autocratic-leadership-2795314>

¹² <https://www.verywellmind.com/what-is-democratic-leadership-2795315#:~:text=Democratic%20leadership%2C%20also%20known%20as,to%20schools%20to%20the%20government.>

leadership is typically adopted by leaders who have a general vision, but do not wish to get involved with the implementation process.

Pros: This kind of leadership environment creates high levels of personal responsibility, and motivation, and allows for creative people to thrive. It equally allows for quick course corrections as motivated people tend to be more willing to react quickly on their own, and with a critical mindset when something needs to be corrected, as opposed to f. ex. an autocratic environment when fear from retribution and the necessity to seek approval from an authority may slow down change. This also leads to higher levels of retention of group members and stability in personnel as the laissez-faire environment favours open communication based on trust, rather than fear. In general, this kind of approach allows for personal growth and encourages innovation and innovative thinking.

Cons: A delegative style can lead to a lack of accountability, in that no specific responsibilities are allotted to the leader or group members, which in turn can cause higher stress levels in employees who feel they themselves are responsible due the lack of clarity in role distribution. (The two sides of the responsibility coin.) Also, self-organizing groups are low in procedural understanding, and cooperation can be difficult, in that the group might work in a somewhat chaotic manner and hence might miss deadlines as the lack of superior guidance can lead to people not knowing who does what, which in turn can cause lowered levels of productivity.

- For more on the pitfalls and drawbacks of laissez-faire leadership, read the following article: "[What Is Laissez-Faire Leadership?](#)".¹³
- For those of you interested in an in-depth understanding Kurt Lewin's leadership styles developed in the framework of social psychology, you can read the original [publication](#).¹⁴
- Finally, watch the following video ("[Kurt Lewin Leadership Styles Framework and why you should avoid using it!](#)")¹⁵ if you'd like to understand why and how Lewin's theory has been surpassed in the second half of the 20th century.

(4) Transformational leadership

Transformational leadership has been first described by Bernard M. Bass¹⁶ and has been identified as being the most effective, especially in the long term. A transformational leader leads by vision, by example, and allows members to identify with a set of values, clearly defined goals, and expectations, with the help of the supportive attitude by the leader (as opposed to the laissez-faire leadership, when the group is self-directed.). This kind of leadership relies on the leader's capacity to inspire, to motivate, and to allow group members to fulfil their potential. Transformational leaders need to be emotionally intelligent and wholesome. This kind of leadership is the most efficient when long-term, inspiring vision is needed, when the leadership role has been earned by merit (i.e., newcomers might have difficulty to earn their co-workers trust), and when short-term focus is not necessary, as implementing vision might take time.

¹³ <https://www.verywellmind.com/what-is-laissez-faire-leadership-2795316>

¹⁴ Lewin, K., Lippit, R., White, R.K., Patterns of aggressive behaviour in experimentally created social climates. Journal of Social Psychology, 10:2 (1939:May) p.271 Accessed: https://tu-dresden.de/mn/psychologie/ipep/lehrlern/ressourcen/dateien/lehre/lehramt/lehrveranstaltungen/Lehrer_Schueler_Interaktion_SS_2011/Lewin_1939_original.pdf?lang=en

¹⁵ <https://www.youtube.com/watch?v=gRuDJ2OewlY>

¹⁶ Bass, B.M. & Avolio, B.J. (Eds.). (1994). Improving organizational effectiveness through transformational leadership. Thousand Oaks, CA: Sage Publications

The pros: transformational leaders set balanced goals, create a trustful environment and a vision-centred communication, hence group members feel valued, grow, and perform at the upmost of their potential, as the method relies on individualized consideration, trust, support, and intellectual stimulation. In a transformational environment, group members tend to experience higher levels of well-being and a sense of empowerment, hence perform better. This kind of leadership is perfect to implement long-term organisational change.

The cons: Given its reliance on trust and long-term vision, transformational leadership takes time do become effective, and can be ineffective at the beginning. Another drawback might be the lack of attention to detail, at least until tasks are divided among group members.

Are you on a journey to become a transformational leader? Do you want to know more about how to become one? Then, here is a simple article for you "[How Transformational Leadership Can Inspire Others](#)"¹⁷ – and more advanced one for the curious: "[Transformational leadership](#)".¹⁸

As mentioned before, none of the above styles can be regarded as being the sole efficient option: it all depends on the psychodynamic, sociohistorical, and situational context and the goals the group has. If you are hesitant about which style you'd like to adopt, consider the people on your team, objectives and what you'd like to emphasize: people or task achievement. You'll find a graph (Figure 1) here below that helps you decide where each of the above leadership styles can be positioned.



Figure 1: Leadership styles according to emphasis¹⁹

(5) Transactional leadership

In a transactional leadership environment, the leader-follower relationship is considered as a transaction. By being part of the group, group members accept to obey the leader, this leads an employee-employer like relationship in which the follower completes well-defined tasks in exchange for monetary compensation.

¹⁷ <https://www.verywellmind.com/what-is-transformational-leadership-2795313>

¹⁸ <https://sites.psu.edu/leadership/2020/11/05/transformational-leadership-theory/>

¹⁹ Retrieved from: <https://www.youtube.com/watch?app=desktop&v=Rmqsv1293Rk>

Pros: the transactional role of the relationship creates clear roles: everyone know what they need to do and what they'll receive in exchange, and leaders can offer considerable amounts of supervision and direction. Group members are motivated because of potential rewards.

Cons: This style hinders creativity, out-of-the-box thinking and proactive initiatives, as well as personal growth as group members tend to focus on the pre-defined tasks and are less willing to go beyond what's expected.

Interested in learning more about transactional leadership? Read the following article "[How a Transactional Leadership Style Works](#)".²⁰

(6) *Situational leadership*

Situational leadership is less of a style, and more of an approach to leadership, which has been suggested all along this chapter. It stresses that no single leadership style is superior to the another, rather, one needs to choose one's leadership style depending on the specific task at hand, the relationship between group members, their maturity/seniority/skill level and motivation, i.e. "*skill and will*", and the leader's authority level. According to this theory, the most effective leaders are capable of adapting their leadership style to the situation.

The first version of this theory was developed by Blanchard and Hersey,²¹ and was further developed by Hersey. It distinguishes between *directing, coaching, supporting, and delegating* leadership styles and pairs them with *team members' competency levels, maturity, and commitment*. Figure 2. illustrates the model. (See below.)

Given its flexible and evolutive nature, it is **difficult to find downsides to this model**. The only difficulty (rather than a drawback) can be that this model requires a high level of self- task- and situational awareness from the leader, as well as a thorough, sophisticated, and non-judgemental understanding of team members competency levels and personalities. In other words: only for highly trained and experienced leaders. Another point to mention is its lack of focus on inspiration, vision and on value as a factor of belonging. Hence it is perfect for short and mid-term project building, but might fail, when it comes down to bringing about long-term organisational transformation.

Of course, its ultimate advantage is its inherent *adaptability*: as it combines several leadership styles and takes into account the task and the personalities at hand, there are few situations when it doesn't work – this is the way to be as a PI in a leadership position, unless you have been tasked with shaking up your organisation.

²⁰ <https://www.verywellmind.com/what-is-transactional-leadership-2795317>

²¹ K. Blanchard, S. Johnson, *The one-minute manager*, Berkley Trade, 1986.; P. Hersey, *Situational leadership*, Centre for Leadership, 1984.

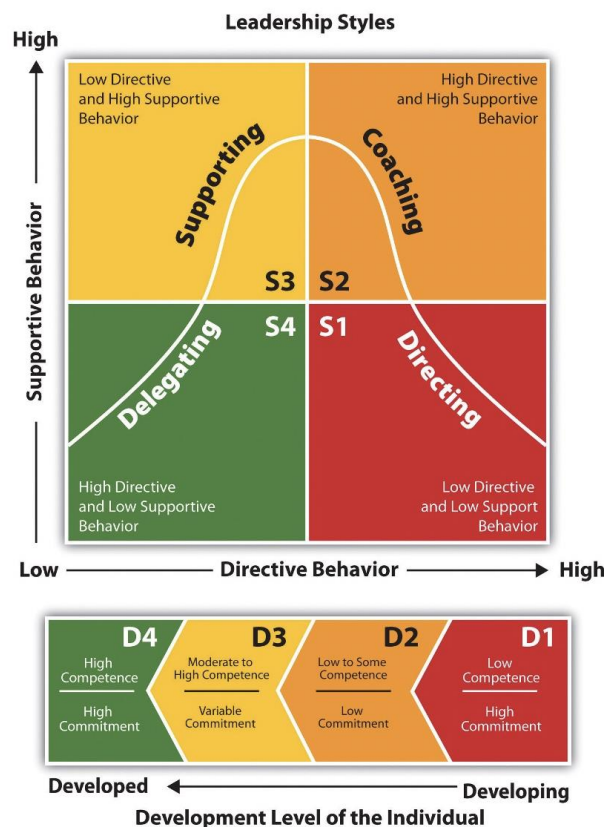


Figure 2: The situational leadership model²²

If you want to learn more about situational leadership, check out the following article “[Situational Leadership Theory](#)”.²³ For those who prefer learning through case examples, we propose to watch the following video “[The Situational Leadership Approach](#)”.²⁴

(7) Servant leadership

The theory of servant leadership was started by Robert K. Greenleaf, who popularized the term in a 1970s essay titled “*The Servant as Leader*.”²⁵ Rather than being a leadership style requiring specific techniques, this is more about redefining the attitude of leaders that the author summed up as: “*I serve because I’m the leader*” and “*I’m the leader, because I serve.*”

Servant leadership is a leadership style that prioritizes the growth, well-being, and empowerment of employees. It aims to foster an inclusive environment that enables everyone in the organization to thrive as their authentic self. Whereas traditional leadership focuses on the success of the company or organization, servant leadership puts employees first to grow the organization through their commitment and engagement. When implemented correctly, servant leadership can help foster trust, accountability, growth, and inclusion in the workplace. Proponents say that by improving the emotional health of employees, servant leadership

²² Retrieved from <https://thinkinsights.net/leadership/situational-leadership/>

²³ <https://www.verywellmind.com/what-is-the-situational-theory-of-leadership-2795321>

²⁴ <https://www.youtube.com/watch?v=zrrAn1grdxw>

²⁵ R.K. Greenleaf., *The Servant as Leader*, Center For Applied Studies, 1973.

empowers employees to express themselves more freely in the workplace. Employees then turn around and give the same nurturing to their co-workers, creating a welcoming environment that enables and encourages growth and quality work. A major aspect of servant leadership is acceptance of others; by creating an environment where everyone feels accepted, it helps create a "psychological ethical climate" that allows employees to be authentic and not fear judgment from leadership for being themselves. It encourages a forgiving and understanding attitude that allows employees to make mistakes, learn from their mistakes, and channel that into personal and professional growth in the organization.

Looking to become a servant leader, rather than a self-serving one? Here is an inspirational video for you, by no other than the management legend, Kenneth Blanchard ("[Ken Blanchard - Servant Leadership](#)").²⁶ If you are looking for a more in-depth understanding of how servant leadership works, read the following article "[What Is Servant Leadership? A Philosophy for People-First Leadership](#)".²⁷

QUIZ

Choose the right answer(s).

- a) Efficient leadership comes down to reacting quickly to a situation and directing the team accordingly.
- b) Authoritarian leadership favours creativity.
- c) A laissez-faire leadership works well when team members are naturally autonomous in their field.
- d) Transformational leadership is person-centred but can be inefficient when detail-oriented tasks are to be performed.
- e) Transactional leadership hinders employee's extrinsic motivation.
- f) Situational leadership might fail if the leader is not experienced enough to assess team members' inherent skillset.
- g) Employees with varied competence levels need a coaching type of leadership style.
- h) Servant leadership reduces the possibility of mistakes.

2.1.3 The qualities and skills of a good leader

DISCUSSION BOARD

Having read the previous chapter, brainstorm about, and list the ten qualities of a good leader you can think of, and then check out whether you were right.

There are a multitude of models that describe the qualities of good leaders. As a steppingstone, we are opting for John Adair's three circular model to describe the **key responsibility areas** in which leadership qualities are needed:

- Building and maintaining the team,
- Achieving the task,
- Developing the individual.

²⁶ <https://www.youtube.com/watch?v=ctZHSa4Qhd4>

²⁷ <https://www.shrm.org/executive-network/insights/servant-leadership-philosophy-people-first-leadership#:~:text=Servant%20leadership%20is%20a%20leadership,thrive%20as%20their%20authentic%20self.>



Figure 3: Responsibilities of a leader²⁸

The advantage of this model is that it doesn't solely focus on task completion, rather, it allows for a wider focus on individual team members and the group as a whole.

Before delving into the necessary qualities, it seems to be essential to set some cornerstones:

1. *Good leaders are made, not born.* In the past, it was a widespread paradigm, that one is either born with natural leadership traits, or is an inborn follower. While indeed, leadership comes more naturally to some of us, in the 21st century, all of us require leadership qualities, at some point, independently from our personalities – and we are all capable of doing it all the while adapting to a given situation/task. It is a just a matter of time and personal growth.
2. *Leadership is a social process.* In the past, it was often believed that leadership comes down to a strong charismatic leader. Today, the widespread belief is that leadership is a collective process within a group of people who can achieve goals together, combining direction, alignment, and commitment (DAC) as shown in Figure 4.



Figure 4: The factors of leadership according to the DAC model²⁹

3. *Leadership is a journey, not a destination.* You are never an ultimate, well-defined leader with a leadership style – you'll have to work on and adapt your leadership qualities throughout your career, based on the situation, the team, and the task at hand.

²⁸ Retrieved from: <https://www.vitae.ac.uk/doing-research/leadership-development-for-principal-investigators-pis/leading-a-research-project>

²⁹ Retrieved from: <https://www.ccl.org/articles/leading-effectively-articles/make-leadership-happen-with-dac-framework/>

This being said, here is a list of qualities you need to possess to be a good, or at least an efficient leader.



Figure 5: The qualities of a good leader³⁰

1. Self-Awareness³¹

The better you understand yourself and recognize your own strengths and weaknesses, the more effective you can be as a leader. Take the time to learn about the 4 aspects of self-awareness and how to strengthen each component.

2. Respect

Treating people with helps ease tensions and conflict, fosters trust, and improves your effectiveness. Creating a culture of respect is about more than just the absence of disrespect. Respectfulness can be shown in many different ways, but it often starts with showing you truly value others' perspectives and making an effort to build belonging in the workplace — both critical components of supporting equity, diversity, and inclusion.

3. Compassion

It's more than simply showing empathy or even listening and seeking to understand — as compassion requires leaders to act on what they learn. This is the core of compassionate leadership, and it helps to build trust, increase collaboration, and decrease turnover across organizations.

4. Vision

Motivating others and garnering commitment are essential parts of leadership. Purpose-driven leaders ensure they connect their team's daily tasks and the values of individual team members to the overall direction of the organization. This can help employees find meaning in their work — which increases engagement, inspires trust, and drives priorities forward. You'll want to communicate the vision in ways that help others understand it, remember it, and go on to share it themselves.

5. Communication

The best leaders are skilled communicators who can communicate in a variety of ways, from transmitting information and storytelling to soliciting input and using active listening techniques.

³⁰ Retrieved from: <https://www.ccl.org/articles/leading-effectively-articles/characteristics-good-leader/>

³¹ Adapted from: <https://www.ccl.org/articles/leading-effectively-articles/characteristics-good-leader/>

They can communicate well both orally and in writing, and with a wide range of people from different backgrounds, roles, levels, geographies, and more.

6. Learning Agility

Learning agility is the ability to know what to do when you don't know what to do. If you're a "quick study" or are able to excel in unfamiliar circumstances, you might already be learning agile. But anybody can foster and increase learning agility through intentional practice and effort.

7. Collaboration

The most effective leaders can work with a variety of colleagues of different social identities, locations, roles, and experiences. As the world has become more complex and interconnected, good leaders find themselves spanning boundaries and learning to work across various types of divides and organizational silos. When leaders value and embrace collaboration, whether within their teams or cross-functionally, several benefits arise — including increased innovation, higher-performing teams, and a more engaged and empowered workforce.

8. Influence

Being able to persuade people through thoughtful use of appropriate influencing tactics is an important trait of inspiring, effective leaders. Influence is quite different from manipulation, and it needs to be done authentically and transparently. It requires high levels of emotional intelligence and trust.

9. Integrity

Integrity is an essential leadership trait for the individual and the organization. It's especially important for top-level executives who are charting the organization's course and making countless other significant decisions. Research has found that leader integrity is a potential blind spot for organizations, so make sure you reinforce the importance of honesty and integrity to managers at all levels.

10. Courage

It can be hard to speak up at work, whether you want to voice a new idea, provide feedback to a direct report, or flag a concern for someone above you. That's part of the reason courage is a key leadership trait — it takes courage to do what's right! Leaders who promote high levels of psychological safety in the workplace enable their people to speak up freely and share candid concerns without fear of repercussions. This fosters a coaching culture that supports courage and truth-telling. Courage enables both team members and leaders to take bold actions that move things in the right direction.

11. Gratitude

Being thankful can lead to higher self-esteem, reduced depression and anxiety, and better sleep. Sincere gratitude can even make you a better leader. Yet few people regularly say "thank you" in work settings, even though most people say they'd be willing to work harder for an appreciative boss. The best leaders know how to show frequent gratitude in the workplace.

12. Resilience

Resilience is more than the ability to bounce back from obstacles and setbacks — it's the ability to respond adaptively to challenges. Practicing resilient leadership means you'll project a positive outlook that will help others maintain the emotional strength they need to commit to a

shared vision, and the courage to move forward and overcome setbacks. A good leader focuses on resilience, both taking care of themselves and also prioritizing leading employee wellbeing, too – thereby enabling better performance for themselves and their teams.

DISCUSSION BOARD

Describe a situation when you or somebody else used one of the leadership qualities listed above, explain how and why they did it, and why it was efficient. Then think of a situation when you or somebody else failed to put one of the above qualities to use and explain what they could have done better. (Strategize).

As you have probably understood from the exercise above, it's one thing to possess certain qualities, it's another to be able to use them properly, that is to have the necessary leadership skills. Among the most important skills of a leader, we find:

- Motivating others,
- Fostering potential,
- Inspiring trust,
- Taking on and giving up responsibility,
- Thinking strategically,
- Setting goals and expectations for everyone,
- Giving and receiving feedback,
- Team building,
- Positivity,
- Authenticity.

To understand what these are, and how and why these skills are needed for effective leadership, watch the following video ("[10 Most Important Leadership Skills For The 21st Century Workplace](#)")³² and read the following article to learn about the skills that you need as a leader ("[10 Most Important Leadership Skills For The 21st Century Workplace \(And How To Develop Them\)](#)").³³

2.1.4 Diversity, equity, and inclusivity

The latest McKinsey [report](#)³⁴ has found that cultural, ethnical, gender and social diversity reinforces the effectiveness of organisations. At the same time, European legislation has adopted several key initiatives to reinforce workplace diversity, such as the *EU Directive on Work-Life Balance for Parents and Carers*, the *European Accessibility Act*, or the *EU directive on gender balance on boards*. (For more, read the following article "[5 most impactful new European laws for your DEI strategy in 2023](#)").³⁵ Indeed, diversity has become a reality in the European space – and inclusivity a task for any self-respecting European leader. However, this diversity comes with its own challenges, and successful leaders need to come up with strategies to tackle these. You can find some tips on how to do so, by reading the following article "[6 tips for successfully leading an international team](#)".³⁶ Another outstanding issue in the leadership field seems to be the glass ceiling women are facing:

³² <https://www.youtube.com/watch?v=jeLeDP00K0k>

³³ <https://www.forbes.com/sites/bernardmarr/2022/07/26/10-most-important-leadership-skills-for-the-21st-century-workplace-and-how-to-develop-them/?sh=38b7582c4de6>

³⁴ <https://www.mckinsey.com/featured-insights/diversity-and-inclusion/diversity-wins-how-inclusion-matters>

³⁵ <https://www.linkedin.com/pulse/5-most-impactful-new-european-laws-your-dei-strategy-iordachescu/>

³⁶ <https://www.proclinical.com/blogs/2023-1/6-tips-for-successfully-leading-an-international-team>

the [Women in the Workplace Study](#),³⁷ conducted by McKinsey and Co. showed that women leaders are leaving their positions at the highest rate ever. Among problems listed, we find pay inequality, lack of opportunities and work-life balance, unconscious bias – and much more. For a concise recap of these issues and strategies to devise solutions, read the following article "[10 Biggest Challenges Women Leaders Face & Ways to Overcome Them](#)".³⁸ Finally, if you're still hungry for information, you can find some tips on how to be a successful woman leader, read the following article "[8 Ways Women Can Become More Effective Leaders](#)"³⁹ and watch the following inspirational video "[Be a Leader: How To Be A Powerful Woman](#)".⁴⁰

3 Project management techniques

Project management involves the planning and organization of a company's resources to move a specific task, event, or duty toward completion. Many project management techniques exist, among those we find the (1) *Waterfall* the (2) *Agile* the (3) *Lean methods* and (4) *Scrum*.

Before discussing those, it seems to be of importance to make a clear distinction between leadership and management. To simplify, the core difference is that while leaders provide vision and make sure the team, and each individual member grow along the creative process, project managers oversee the day-to-day practicalities of project completion. (More on that in Figure 8, here below.) So that we are clear, this does not mean that one of them is superior to the other, on the contrary, they are "*two distinctive and complementary activities. Both are necessary for success in an increasingly complex and volatile business environment.*"⁴¹

³⁷ <https://womenintheworkplace.com/>

³⁸ <https://succeedsmart.com/blog/10-biggest-challenges-women-leaders-face-ways-to-overcome-them>

³⁹ <https://www.forbes.com/sites/committeeof200/2020/03/26/8-ways-women-can-become-more-effective-leaders/?sh=74eeb3c628f9>

⁴⁰ https://www.youtube.com/watch?v=e9j4_tghBlc

⁴¹ Kotter, J.P. (1990) *A Force for Change: How Leadership Differs from Management*. New York: Free Press.

Figure 1: Leadership and Management
(Buchanan and Huczynski, 2004, p 718 - based on Kotter, 1990)

| | Leadership functions | Management functions |
|--------------------|--|---|
| Creating an agenda | <i>Establishing direction:</i> Vision of the future, develop strategies for change to achieve goals | <i>Plans and budgets:</i> Decide action plans and timetables, allocate resources |
| Developing people | <i>Aligning people:</i> Communicate vision and strategy, influence creation of teams which accept validity of goals | <i>Organizing and staffing:</i> Decide structure and allocate staff, develop policies, procedures and monitoring |
| Execution | <i>Motivating and inspiring:</i> Energize people to overcome obstacles, satisfy human needs | <i>Controlling, problem solving:</i> Monitor results against plan and take corrective action |
| Outcomes | Produces positive and sometimes dramatic change | Produces order, consistency and predictability |

Figure 8: The difference between leadership and management⁴²

Before moving on to project management techniques, a final word on the distinctive roles of a project manager and a project coordinator. A project manager is the person who is responsible for the overall success of a project. A project coordinator, on the other hand, is responsible for supporting the project manager and ensuring that the project runs smoothly. This includes tasks such as scheduling meetings, maintaining project documentation, and coordinating project activities. The project coordinator is often seen as the glue that holds the project together, as they are responsible for ensuring that everyone is on the same page and that communication flows smoothly between all stakeholders.

(1) Waterfall

This is similar to traditional project management but includes the caveat that each task needs to be completed before the next one starts. Steps are linear and progress flows in one direction—like a waterfall. Because of this, attention to task sequences and timelines is very important in this type of project management. The Waterfall method provides a clear plan from the start and identifies dependencies before the project begins. However, it's a rigid technique that may prove challenging if your project scope or objectives change over time. Often, the

⁴² Retrieved from:

https://ore.exeter.ac.uk/repository/bitstream/handle/10036/17493/what_is_leadership.pdf?sequence=1&isAllowed=y

size of the team working on the project will grow as smaller tasks are completed and larger tasks begin. The Waterfall project management technique is best for projects that aren't expected to change over time and need clear direction from the start. However, projects that need flexibility throughout the project timeline should consider another technique such as Scrum or Agile, below.

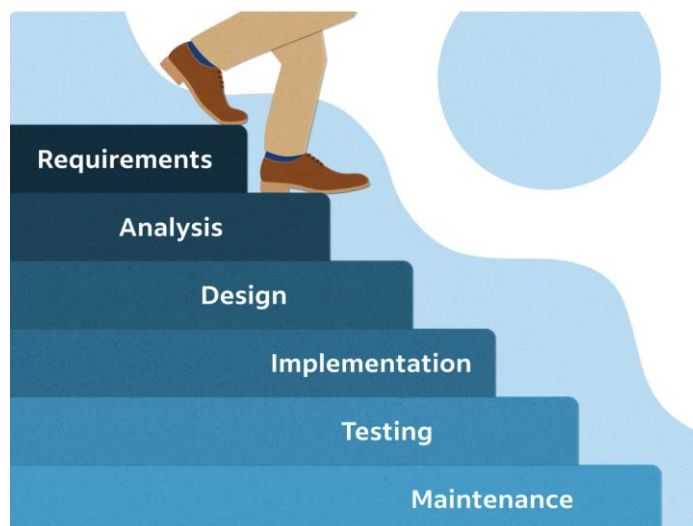


Figure 6: The Waterfall management method⁴³

(2) Agile

Agile is a project management methodology that uses short development iterative cycles to prioritize on continual improvement in the development of a product or service where requirements and solutions evolve through collaboration between self-organizing cross-functional teams. It is an approach based on delivering requirements iteratively and incrementally throughout the project life cycle. At the core of Agile is the requirement to exhibit central values and behaviours of trust, flexibility, empowerment, and collaboration. Agile is characterized by the division of tasks into short circular phases of work and frequent reassessment and adaptation of plans.

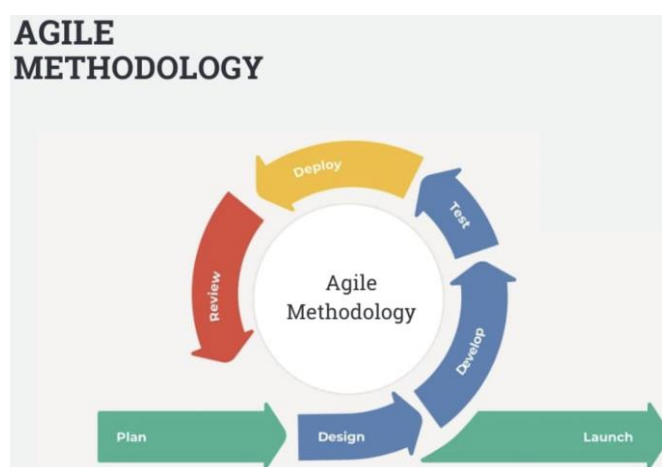


Figure 7: The Agile cycle⁴⁴

⁴³ Retrieved from: <https://www.indeed.com/career-advice/career-development/waterfall-project-management>

⁴⁴ Retrieved from: <https://interqualitybg.com/en/resources/scrum-and-agile-resources/agile-methodology>

Agile project management does not follow a sequential stage-by-stage approach. Instead, phases of the project are completed in parallel to each other by various team members in an organization. This approach can find and rectify errors without having to restart the entire procedure. This project management methodology has emerged in software development with the publication of the [Agile Manifesto](#) in 2001⁴⁵ but it has been considered beneficial and used successfully in other industries, for example, it can be a useful tool in the development of new medical devices and pharmaceutical products.

For a more thorough guide on how to work in an Agile mode, read the resources on the following [website](#).⁴⁶

(3) Lean

This management technique is all about avoiding waste, both of time and of resources. The main idea is to create more value with fewer resources. When managing a project with this approach, the goal is similar to that of the [lean enterprise](#) production principle.⁴⁷ The only resources that will be used on the project are those that directly contribute to its successful completion. Lean project management relies on five key principles (as see in Figure 9):



Figure 9: Lean management⁴⁸

The lean methodology, when successfully adapted to the context, can be a useful tool in clinical trial management, especially when the aim is to reduce the use and waste of resources whether they'd be human, budgetary, or material.

For more on how to implement a lean strategy, read the following article "[Example of Lean Management](#)".⁴⁹

⁴⁵ <https://agilemanifesto.org/iso/en/principles.html>

⁴⁶ <https://businessmap.io/agile/project-management>

⁴⁷ <https://www.investopedia.com/terms/l/lean-enterprise.asp>

⁴⁸ Retrieved from: <https://boardmix.com/examples/example-of-lean-management/#:-:text=Example%20of%20Lean%20Management%20%E2%80%93%20Toyota&text=In%20the%20past%2C%20Toyota%20produced,of%20dollars%20in%20the%20process.>

⁴⁹ <https://boardmix.com/examples/example-of-lean-management/#:-:text=Example%20of%20Lean%20Management%20%E2%80%93%20Toyota&text=In%20the%20past%2C%20Toyota%20produced,of%20dollars%20in%20the%20process.>

Lean and *Six Sigma* are business management strategies commonly used in production industries to improve process efficiency and quality. During the past decade, these process improvement techniques increasingly have been applied outside of the manufacturing sector, for example, in health care and in software development. Click on the link to the following [article](#)⁵⁰ to read about what they are and how to use them to improve the processes involved in clinical and translational research.

(4) Scrum

The Scrum project management technique is based on the Agile framework, and it manages a project in short cycles called “sprints.” Each sprint lasts roughly one or two weeks, with daily stand-up meetings to keep team members on track. At the start of each sprint, the team commits to completing a certain number of tasks. At the end of each sprint, the team meets for a longer retrospective and then plans for the next sprint based on the completed tasks. Scrums are led by a “product owner” who keeps track of an overall project backlog of tasks using a [Scrum board](#).⁵¹ A Scrum board is a visual representation of your project broken down into specific columns: Project Backlog, Sprint Backlog, In Progress, Review and Done. Tasks are represented as cards that move through these columns. Each sprint, tasks are moved from the Project Backlog to the Sprint Backlog. When a team member starts a new task, it’s moved to In Progress. Once it’s completed, the task is reviewed and moved to the Done column. The product owner will conduct periodic [backlog grooming](#)⁵² to ensure the project backlog remains up to date based on the work completed. For this reason, Scrum is a great technique for projects that may change over time and need shorter feedback loops, as with software development. The Scrum process is overseen and facilitated by a Scrum Master, a revolutionary new role, that differs from that of a traditional management role, as it equates more to process facilitation.

If you want to learn more about the process of Scrum implementation, read and watch the resources on the following [website](#).⁵³ For more focused view, just watch the following video on the scrum process “[What is Professional Scrum?](#)”⁵⁴ and read the following section for [future Scrum Masters](#).⁵⁵

Other than the above workflow management techniques, others exist, such as [the work breakdown structure \(WBS\)](#)⁵⁶ and the [critical path method \(CPM\)](#).⁵⁷ The use of the latter is widespread and useful in projects with multiple deliverables and strict deadlines; however, it might hinder flexibility and creativity, hence it is recommended to combine it with an agile approach to reinforce the adaptability of the team. Finally, for successful project management, you will need *concrete tools* that will help you structure the work of your team. The detailed explanation of how they work and how to use them exceeds the scope of the core curriculum of this chapter, however, if you are curious, you can read the articles on the following links about:

- [Gantt charts](#), with templates and tips on how to use them.⁵⁸

⁵⁰ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2835466/>

⁵¹ <https://www.forbes.com/advisor/business/what-is-a-scrum-board/>

⁵² <https://www.forbes.com/advisor/business/backlog-grooming/>

⁵³ <https://www.scrum.org/>

⁵⁴ <https://www.youtube.com/watch?v=BYlv7eP9zgg>

⁵⁵ <https://www.scrum.org/pathway/scrums-master/>

⁵⁶ <https://www.forbes.com/advisor/business/what-is-work-breakdown-structure/>

⁵⁷ [https://www.wrike.com/blog/critical-path-is-easy-as-](https://www.wrike.com/blog/critical-path-is-easy-as-123/#:~:text=The%20Critical%20Path%20Method%20(CPM,activities%20from%20start%20to%20end.)

[123/#:~:text=The%20Critical%20Path%20Method%20\(CPM,activities%20from%20start%20to%20end.](https://www.wrike.com/blog/critical-path-is-easy-as-123/#:~:text=The%20Critical%20Path%20Method%20(CPM,activities%20from%20start%20to%20end.)

⁵⁸ <https://www.forbes.com/advisor/business/software/what-is-a-gantt-chart/>

- [Program evaluation and review technique \(PERT\)](#), a less linear tool, with tips and templates.⁵⁹

QUIZ

Choose the right answer(s).

- a) The project coordinator oversees the hiring of personnel.
- b) The project leader supervises the project manager.
- c) The Waterfall model allows for easy course correction.
- d) The Waterfall model is adapted to developing medical devices.
- e) The Agile model allows for parallel working processes to run at the same time.
- f) The Lean project management style is well adapted to clinical trials.
- g) Gantt Charts are easily adaptable to the Agile management model.
- h) In a Scrum model, the scrum master takes over the managerial duties.

4 Leadership and project management for PIs⁶⁰

As the leader of a research team, you'll be tasked with:

- identify aims and vision for the group, purpose, and direction – define the activity (the task),
- provide guidance and adjustment in the face of adversity,
- identify resources, people, processes, systems, and tools (including finance, communications, IT),
- apply for funding,
- create a communication strategy,
- liaise with external stakeholders and other representational duties,
- help other researchers develop their skills and career through the process,
- understand, adapt, and develop your own leadership ability.

As the manager, you'll be tasked with running the project by:

- creating the plan to achieve the task – deliverables, measures, timescales, strategy, and tactics,
- establishing responsibilities, objectives, accountabilities, and measures, by agreement and delegation,
- setting standards, quality, time, and reporting parameters,
- controlling and maintain activities against parameters,
- monitoring and maintaining overall performance against plan,
- reporting on progress towards the group's aim,
- reviewing, re-assessing, and adjusting plans, methods, and targets as necessary,
- liaising with and between internal stakeholders: team members, project specialists the project coordinator, and the project leader.

⁵⁹ <https://www.lucidchart.com/pages/pert-charts>

⁶⁰ The chapter has been largely adapted from <https://www.vitae.ac.uk/> for the purposes of this curriculum.

As mentioned before the task and responsibilities of the project leader, manager and coordinator differ from and complete each other. These roles can be centralized in the hands of one person, but ideally should be taken on by different stakeholders as assuming all the aforementioned roles can lead to confusion and difficulties in communication, coupled with overload and burnout.

4.1 Intellectual leadership

Other than being simply knowledgeable in your own discipline, leadership in research requires from PIs to be highly skilled and knowledgeable in other areas, such as *research impact, knowledge exchange and communication strategy* which will be discussed in Chapter 11⁶¹ along with other notions related to scientific communication. The matter of building a communication plan is discussed in Chapter 3⁶² on trial management, under point 2.2.3.

Another important role for PIs comes down to their understanding of the *research environment*. This is always a mixture of understanding the local, national, and European environments and legal frameworks, and in the case of a cross-the-globe collaboration, the global context. Chapter 4,⁶³ dedicated to the legal context gives a thorough overview of quality and regulatory affairs.

As an add-on to Chapter 4, it seems to be necessary touch upon certain initiatives that have created a European research environment, which can help researchers to build networks, collaborate more effectively and find appropriate funding.

[Innovation Union](#)⁶⁴ is a key part of the EU's strategy to 2020 and aims to turn research into new and better services and products to help Europe remain globally competitive and improve the quality of life in Europe. Within this context, nearly €80 billion to support funding was offered to support research and innovation over 7 years through [Horizon 2020](#).⁶⁵ One of the themes is delivering a [European Research Area \(ERA\)](#).⁶⁶ Since 2000, the aim of the ERA has been to create an open labour market for researchers where researchers can move and interact freely, benefit from world-class infrastructures and work with excellent networks of research institutions. If you want to know more about them, click on the links in the text.

Moreover, the European Commission has adopted a Charter for Researchers and Code of Conduct for the Recruitment of Researchers. These two documents, addressed to researchers as well as to employers and funders in both the public and private sectors, are key elements in the European Union's policy to make research an attractive career, which is a vital feature of its strategy to stimulate economic and employment growth. [The European Charter for Researchers](#)⁶⁷ addresses the roles, responsibilities and entitlements of researchers and their employers or funding organisations. It aims at ensuring that the relationship between these parties contributes to successful performance in the generation, transfer and sharing of knowledge, and to the career development of researchers. [The Code](#)

⁶¹ CONSCIOUS: Chapter 11, Scientific Communication; <http://consciousii.novaims.unl.pt/course/view.php?id=30>

⁶² CONSCIOUS: Chapter 3, Trial Management; <http://consciousii.novaims.unl.pt/course/view.php?id=26>

⁶³ CONSCIOUS: Chapter 4, Quality and Regulatory Affairs and Sources of regulatory information; <http://consciousii.novaims.unl.pt/course/view.php?id=8>

⁶⁴ <https://www.vitae.ac.uk/policy/european-research-area/innovation-union>

⁶⁵ <https://www.vitae.ac.uk/policy/european-research-area/horizon-2020>

⁶⁶ <https://www.vitae.ac.uk/policy/european-research-area>

⁶⁷ <https://euraxess.ec.europa.eu/jobs/charter/european-charter>

[of Conduct for the Recruitment of Researchers](#)⁶⁸ aims to improve recruitment, to make selection procedures fairer and more transparent, and proposes different means of judging merit. Merit should not just be measured on the number of publications but on a wider range of evaluation criteria, such as teaching, supervision, teamwork, knowledge transfer, management, and public awareness activities. The EC's [HR Excellence in Research Award](#)⁶⁹ is given to institutions which can demonstrate commitment to implementing the principles of the European Charter and Code. Feel free to click on the links above to learn more about these initiatives.

To recap, you'll find here below, the roles of a clinical investigator, based on their special focus on certain areas of responsibility and target (Figure 10).

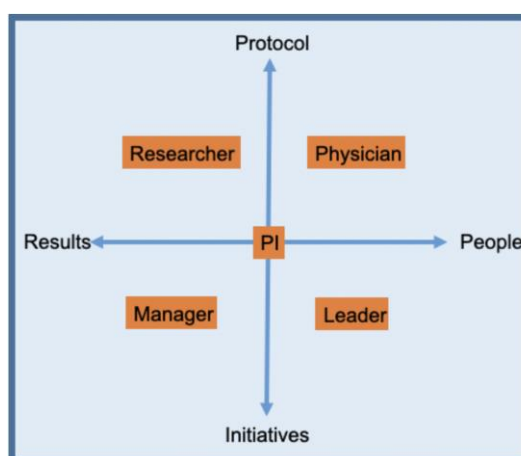


Figure 10: The roles of a clinical investigator⁷⁰

4.2 Leading a research project

4.2.1 Effective research project leadership

Adapting your leadership style

As explained in previous chapters, effective leadership comes down to your capacity to adapt to the situation (situation leadership), the competencies, motivations of the team members and your own authority level. In that regard, your task is to choose and adaptatively alternate between directive, coaching, supporting and delegating styles.

Another important ability for you will be to choose or alternate between your managerial and leadership roles, and making sure, if you opt for merging the two roles, to clarify in which of your roles you are acting and to communicate accordingly. A reminder and somewhat different approach to the distinction between the two roles can be seen here below in Figure 11.

⁶⁸ https://euraxess.ec.europa.eu/sites/default/files/brochures/am509774cee_en_e4.pdf

⁶⁹ <https://www.vitae.ac.uk/policy/hr-excellence-in-research>

⁷⁰ Retrieved from: <https://www.cabinetcaptitude.com/interventions-en-organisations/leadership-of-pi>

| A manager... | A leader... |
|-------------------------------|------------------------------|
| Administers | Innovates |
| Maintains | Develops |
| Imitates | Originates |
| Focuses on systems/structures | Focuses on people |
| Relies on control | Inspires trust |
| Has a short-range view | Has a long-range perspective |
| Asks how and when? | Asks what and why? |
| Looks at the bottom line | Looks at the horizon |
| Accepts status quo | Challenges status quo |
| Does things right | Does the right things |

Figure 11: The manager and the leader⁷¹

Time management

Another aspect of effective leadership is *personal time management*. When leading a team, typically, three task types will fall on you: administration (getting the paperwork done), managing people (getting people to do things right), leadership (getting people to do the right things.) Given the deadline-related nature of administration, you'll often find that paperwork and other administrative duties need to be prioritized. However, this might lead to a loss of global understanding and foresight over the project and might do more harm than good in the long term. That's why prioritizing leadership duties over administrative and managerial tasks by delegating with clear instructions can be helpful – hence our suggestion to create a clear distinction between leader, coordinator, and manager. This can also be helpful in terms of team dynamics: this way, the members of your team won't feel that their leader micromanages them.

Finally, here are some useful tips to improve your time management skills as a leader:

- make sure you make time for the things that only you can do,
- look after yourself, you're no use to anyone if you're not fit and well,
- maintain your networks, they make your job much easier,
- operate on the 'good enough is good enough' principle but work out very carefully how good 'good enough' is,
- never say "yes" in the corridor,
- make time for people but don't let them waste your time,
- develop a coaching style of management so that people learn to solve their own problems,
- make time for fun.

4.2.2 Applying for research funding

While the research environment can shift from country to country, the general steps towards applying for funding remain quite similar and can be summed up as follows:

1. Research project stakeholders,
2. Developing a research proposal,

⁷¹ Retrieved from: <https://www.vitae.ac.uk/doing-research/leadership-development-for-principal-investigators-pis/leading-a-research-project/effective-research-project-leadership-1>

3. Identifying research funding,
4. Costing and pricing a research proposal,
5. Internal approval for research proposals,
6. Submitting a research proposal,
7. Research contract negotiation.

Identifying and liaising with external stakeholders

External stakeholders are people or organizations who have an interest in your research project or affect or are affected by its outcomes. Stakeholders include those who are both supportive of your research, as well as those who may be less supportive or indeed critical of it. The purpose of stakeholder analysis is to:

1. identify project stakeholders,
2. determine what interest each stakeholder has in your project,
3. assess how much influence stakeholders have on the project,
4. consider how you will manage and communicate with different types of stakeholders.

Projects often have more stakeholders than people realize, and all sorts of people and organisations can emerge from this process. It may be helpful to consider:

- who is directly involved in the project?
- who are the potential beneficiaries of the research?
- who might be negatively affected by it?
- who directly or indirectly supports your research?
- do you have any opponents?
- are there existing positive or negative relationships amongst your stakeholders?

Once project stakeholders are identified, it is important to consult them directly. This consultation process might reveal certain intricacies and differences in opinion which you can proactively counteract by implementing appropriate action plans and communication strategies.

Another aspect of stakeholder identification is *analysing stakeholder involvement* and influence in your research. Some stakeholders will have considerable influence over your project and its outcomes either by directly controlling resources or key decisions (e.g., funders, ethics committees) or because they are central to successful project implementation (e.g. research participants). By considering and mapping your different stakeholders according to their level of influence and interest you can plan how you will manage and prioritise your engagement with them. When mapping stakeholders in this way, it is helpful to flag which are supporters, and which are critical of your project. Critics, particularly those with high influence need to have their views acknowledged in order to avoid conflict. One way of doing this is to invite them to join the project steering group. Properly managed they can become champions - "*keep your friends close and your enemies closer.*"

Developing your research proposal

When developing your research proposal, first you'll go through a *brainstorming phase*: the key to success here is to rely on your team, to gather all ideas and focus on *quantity*, not quality, with an open mind. There's no such thing as a bad idea at this stage – you'll decide later on

during the filtering and targeted restructuring phase. Synthesize all the ideas in a comprehensive document.

Your next step is *developing your proposal in a structured manner*, targeting specific funding schemes. Here is how your proposal shall be structured.

- Abstract (consider writing your abstract last; it will allow for more concise, project specific information),
- Problem Statement or significance of research,
- Project purpose (overall goal and specific objectives),
- Research Design or workplan (activities and timelines),
- Applicant qualifications and capabilities,
- Evaluation Plan,
- Budget (summary and justifications - refer to the research design/workplan),
- Appendix (everything else).

Finally, some useful tips for writing your proposal:

- Carefully adapt your proposal to the eligibility and evaluation criteria in the call. This might mean adapting your project a bit.
- Come up with a compelling argument that highlights the importance of your research
- After peer review, task an external, lay proof-reader to verify the accessibility of your proposal. Remember: you want your proposal to be an easy read. Avoid acronyms, jargon, and use the active voice.
- Use as many visuals as possible - figures, graphs, timelines - to facilitate the reading of your text.
- Leave ample time for finalizing the project, if not, technicalities might make your project ineligible. Such pitfalls to avoid are: late submission, narrative too long, fonts, margins, spacing too small, signatures or certifications missing, budget narrative missing, insufficient number of copies, inappropriate binding.

Identifying research funding

If you have not already contacted the research office in your institution, this is the right moment. Most research offices have *databases of research funders* and *funding opportunities*, often with *email alert services*. Be on the lookout for those sources of information. Even if you already know about the funding databases available in your institution (and how to use them), it is often worth talking to your research office as they will often have access to intelligence about up-and-coming opportunities. You can submit your draft proposal to them (or at least its abstract), to help them find the right funder for you.

Other than your organization's own databases, here are some European Funds you can apply to. The [European Research Council](http://erc.europa.eu/) (ERC)⁷² was created in 2007 as part of the [Seventh Framework Programme](http://cordis.europa.eu/fp7/home_en.html).⁷³ It is an independent body that funds investigator-driven frontier research across all disciplines based on peer-reviewed excellence as the sole criterion for success, irrespective of nationality, gender, or location of the applicant. The ERC offers two, highly competitive, funding schemes that are open to early career researchers:

⁷² <http://erc.europa.eu/>

⁷³ http://cordis.europa.eu/fp7/home_en.html

- ERC Starting Grants for up to five years that are open to up-and-coming independent research leaders of any nationality with two to seven years' research experience after their doctoral award
- ERC Consolidator Grants 'for researchers who have been awarded their first PhD over seven and up to twelve years prior to the publication date of the call'.

[The European Commission](#)⁷⁴ proposes a multitude of funding opportunities based on your profile – click on the link to explore it in detail. Another important initiative to mention is the [Marie Skłodowska-Curie Actions](#)⁷⁵ that involves innovative training networks (ITN), individual fellowships (IF), Research and Staff Exchanges (RISE) and co-funding opportunities (COFUND).

[EURAXESS](#)⁷⁶ is a joint initiative of the European Commission and 33 European member and associated countries to create a more favourable environment for researchers to move freely in the [European Research Area](#).⁷⁷ It provides a range of information and support services to researchers who wish to study or work in Europe or stay connected to it. The EURAXESS network has more than 200 centres across 40 European countries that offer direct help to researchers to move between countries. It also provides links to international, European, national, and regional web resources covering:

- research fellowships and grants
- research job vacancies published by universities, industry, research organisations, foundations, etc
- administrative and legal issues related to moving from one country to another and up to-date information about cultural and family-related issues (housing, schooling, day-care, language courses, etc.)
- policies relevant to the career development of researchers in Europe

Another European researcher network is [EURODOC](#) (European Council of Doctoral Candidates and Junior Researchers).⁷⁸ Their mission is to represent and consolidate the community of doctoral candidates and early career researchers in Europe in their pursuit of a decent professional life.

The [EURAXIND project](#)⁷⁹ aims to strengthen relationships between industry and academia by increasing employer engagement with the existing [EURAXESS](#)⁸⁰ networks through expertise, practical toolkits, benchmarking surveys and workshops. EURAXIND will provide opportunities for collaborations and strategic partnerships and promote the recruitment of highly skilled researchers into all employment sectors.

Costing and pricing

There is a clear difference between costing and pricing.

⁷⁴ https://commission.europa.eu/research-and-innovation_en

⁷⁵ <https://marie-sklodowska-curie-actions.ec.europa.eu/funding>

⁷⁶ <http://ec.europa.eu/euraxess/>

⁷⁷ <https://www.vitae.ac.uk/policy/european-research-area/european-research-area>

⁷⁸ <http://www.eurodoc.net/>

⁷⁹ <https://www.vitae.ac.uk/researcher-careers/euraxess-uk-career-development-centre/euraxind>

⁸⁰ <https://euraxess.ec.europa.eu/>

- The *cost* of a piece of research is how much it will cost your institution for you to undertake the research in question.
- The *price* is how much you request (or rather, eventually get) from your funder.

Typically, the price is lower than the cost. So, the key issue for a PI is to be sure that the funds awarded will in fact cover the actual costs of the research, and this is a question that *your research office* should be able to answer and reassure you about. You should find help and internal systems available to make all the necessary calculations for your proposal. If you really do need to know how to do it yourself then there are many guides and training courses available (for example, visit [ARMA](http://www.arma.ac.uk/)⁸¹ or [BUFDG](http://www.bufdg.ac.uk/)⁸²). Your own institution may offer training or guidance.

When costing research activities (i.e., project proposals) three main cost elements are considered:

- *Directly Incurred (DI) costs*, i.e., those that can be explicitly identified and recorded against a project. Examples are: a research assistant working full time on the project, equipment bought for exclusive use by the project, travel directly related to the project, materials bought for the project, etc.
- *Directly Allocated (DA) costs*, i.e., those that are attributable to a project, but are estimated rather than directly recorded. Examples are: the 10% of your time that you expect to spend on the project, a fraction of pool staff that you might draw on, your use of space in the building
- *Indirect (Ind) costs*, i.e., all the other costs of running your institution that are not directly attributable to the project, but nonetheless need to be paid for. Examples are the library, HR, finance, the vice chancellor's office, IT infrastructure.

Only when the full costs have been calculated are you in a position to consider the pricing - that is, how much money should you ask for? Some research funders/schemes stipulate a non-negotiable proportion of costs, f. ex. the European Commission tends to work with 75% ceiling. This allows you to calculate the missing portion and look for additional funding from industrial or commercial bodies.

Internal approval

Your institution will have an internal approval process for submitting proposals for research funding, which will almost certainly be a formal process. You should make yourself aware of your local policy before contacting any potential external funder. Most processes have a multi-stage sign-off procedure, which could be as little as one person needing to approve a submission to more than five different signatures, for example:

1. you, the principal investigator (most institutions require a statement from you - implicit or explicit - that you have followed appropriate procedures, etc.),
2. head of school/department,
3. dean of faculty,
4. research office,
5. finance office,
6. deputy/pro-vice-chancellor.

⁸¹ <http://www.arma.ac.uk/>

⁸² <http://www.bufdg.ac.uk/>

If the process at your institution requires a large number of signatures, then you should allow PLENTY OF TIME for the documents to circulate. This needs to be built in to your [proposal development schedule](#)⁸³ and not left to the last minute as often these sign-offs include specific undertakings, for example, a confirmation that the proposal has been internally peer reviewed.

Submitting your research proposal

You must ensure that the proposal has been fully signed off by your internal approval process before submitting it. An increasing number of sponsors are using electronic submission systems - do not underestimate the time needed to use these systems to submit proposals. At your earliest opportunity you should ensure that:

- your institution is registered to use the system,
- you are registered to use the system.

Most electronic submission systems require a central sign-off, which means that when you submit your proposal it does not go directly to the proposed funder but instead is routed to your central research office for them to do the actual submission (after they have made appropriate governance checks). You will need to leave additional time for this step.

For non-electronic submissions (or submissions by email) you will probably need to ensure that your institution's research office has a copy of the proposal as submitted. You will almost certainly need a number of signatures on hard-copy submissions - again you need to leave time for this; many research offices will arrange for the central signature for you.

Research contract negotiation

The amount of negotiation that takes place between the time the funder expresses serious interest in your project and when the contract is finally agreed can vary considerably.

- some funders will just respond with a "yes" or "no" and the 'negotiation' could be as simple as accepting the grant offer,
- others may come back positively but with some suggested changes and a proposed (invariably) lower budget offer,
- some schemes (e.g., UK research council schemes) provide you with feedback from the external peer reviewers and may request more factual information or clarification.

For commercial funders, after an agreement in principle, there can often be a protracted series of discussions around the price, scope, and intellectual property issues in the project. For all but the simplest of interactions you are strongly advised to contact your research office for advice and potentially to negotiate on your behalf. When the terms of the project are agreed a signature will be required on behalf of your institution. This is unlikely to be you or your head of department but more likely someone in the central part of your institution - check with your research office.

⁸³ <https://www.vitae.ac.uk/doing-research/leadership-development-for-principal-investigators-pis/leading-a-research-project/applying-for-research-funding/developing-a-research-proposal>

QUIZ

Choose the right answer(s).

- a) The key successful time management is planning and making sure you can do everything on time.
- b) It is important to involve opponents of the research project from the planning stage.
- c) When applying for funding, you should start with writing the abstract.
- d) The best way to write a funding proposal is to use accurate scientific language.
- e) You should make sure that your funding proposal is standardized, independently from the call you're applying to.
- f) Horizon 2020 is an 80 bio. EUR research funding scheme.
- g) Indirect costs are part of a funding proposal.
- h) The PI and the dean sign the research proposal.

4.3 Building and managing a research team

What constitutes a *research team* in one department or institution might be described elsewhere as a *research group*, *research centre*, *research unit* or *research institute*. Regardless of the terminology used, the key characteristic of a research team is that it comprises a group of people working together in a committed way towards a common research goal.

There are many different configurations of research teams in academia and boundaries can be 'fuzzy'. They may comprise co-investigators, fractional or pooled staff, technical and clerical staff (central admin, finances, legal, HR) and postgraduate research students. There may also be inter- and intra-institutional dimensions and increasingly international ones; some team members' contributions may well be largely virtual, via email, phone, or videoconference. Also, team members may have different disciplinary backgrounds, different motivations and aspirations, and different cultural backgrounds. Over time, team members' roles may change from being core (fully dedicated to the research goal) to peripheral (committed to this research goal, but also working in one or more other teams), and vice-versa. Whatever happens, your role is to build a balanced team with complementary skillsets and personalities.

To do so, you can profile your team members using [Belbin's model of team roles](#).⁸⁴

Your roles in managing the team are diverse:

- establish, agree, and communicate standards of performance and behaviour,
- establish style, culture, approach of the group – soft skill elements,
- monitor and maintain discipline, ethics, integrity and focus on objectives,
- anticipate and resolve group conflict, struggles or disagreements,
- assess and change as necessary the balance and composition of the group,
- develop team-working, cooperation, morale, and team-spirit,
- develop the collective maturity and capability of the group - progressively increase group freedom and authority,

⁸⁴ <https://www.teambuildingportal.com/articles/systems-and-approaches/belbin-team-roles>

- encourage the team towards objectives and aims – motivate the group and provide a collective sense of purpose,
- identify, develop, and agree team- and project-leadership roles within group,
- enable, facilitate, and ensure effective internal and external group communications,
- identify and meet group training needs,
- give feedback to the group on overall progress; consult with and seek feedback and input from the group.

4.3.1 Setting expectations for research teams

There are areas of your project where you should provide clear leadership and set expectations for your team. Where appropriate you should involve the team in decision-making; this helps build a sense of ownership and commitment.

- **Working arrangements** – this can include expected office (or lab) hours and the flexibility of such arrangements.
- **Your availability** – be clear as to how often you will be available for consultation and how you can be reached.
- **Division of responsibilities** – make sure every individual knows not only their own responsibilities but where responsibility lies for all other parts of the project and how their work fits into the team.
- **Lines of communication** – everyone should be clear about who to ask about what issue(s) and how information will come to them.
- **Monitoring and reporting arrangements** – researchers need to know when they will need to report, to whom and how results will be measured.
- **Standards of work** – all should be aware of the quality and consistency that you expect from your team.
- **Ethics** – each member of your team should understand how they should approach their work, especially where there are ethical sensitivities.
- **Deadlines** – make sure it is clear when each part of the project needs to be finished and not just the final deadline.

When setting expectations, make sure you:

- Communicate early, clearly, and frequently.
- Maintain a two-way dialogue with co-workers. Make sure your team members can communicate their expectations to you.
- Set feasible goals. Too narrow deadlines and tasks the complexity of which exceeds team members' competencies can lead to failure and frustration.
- Are flexible. Leadership is all about adjustment to change, and each project is subject to unforeseen circumstances.

4.3.2 Monitoring research team progress

To monitor research team progress, you need to set up a *formal reporting* and an *informal supervision* system.

As for *formal reporting*, you need to make sure it happens regularly, either at a set moment in time (f. ex. weekly) or at certain key moments of the project. It must be clear for everyone what is being measured, and this from the beginning of the project. Another important task for you is to clarify responsibilities: who reports to whom. Finally, the reporting process shall be ongoing and active all the way through the process.

Your role in informal daily supervision is mainly choosing the team members whom you delegate this task to. Here, the most important thing is communication: make sure your researchers communicate with you and each other regularly and openly, know that it is OK to make mistakes and dare to admit them or ask for help. Your task is to provide constructive criticism when needed, but never forget to praise a task well done. *Constructive feedback is structured as follows:* (1) explain what works (positive feedback) (2) point what needs to be improved (negative feedback) (3) explain how it could be improved.

Finally, one of the main leadership skills is being people-centred and the capacity to use empathy and compassion as team management tools. Of course, you don't need to know about your co-workers' private lives, however, keeping an open door allows you to anticipate difficulties, adapt and provide support. If one of your co-workers goes through significant difficulties, (f. ex. new-born, death), you want to make sure their work is carefully supervised, help is provided – and take this into account when allotting new responsibilities and establishing schedules.

As explained in the chapter on general leadership, your role as a team leader is not to self-serve but to serve your team. As a result, you have a role to play in allowing your researchers to grow. Read the following articles if you want to learn about:

- [Developing individual researchers](#),⁸⁵
- [Performance management of researchers](#),⁸⁶
- [Appraisal of researchers and the appraisal process](#),⁸⁷
- [Supporting researchers' professional development](#),⁸⁸
- [Supporting researchers' career development](#),⁸⁹
- [Mentoring and coaching](#).⁹⁰

4.4 Developing yourself as a PI

The first step to self-development is *self-reflection*. To do so, first we suggest you have a look at the [Researcher Development Framework](#) (RDF)⁹¹ that centres around 4 key domains: Knowledge and intellectual abilities (Domain A), Personal Effectiveness (Domain B), Research Governance and Organisation (Domain D), and then identify which skills you already possess and which ones you would like to develop with the help of the list of [skills and characteristics of a PI](#).⁹² This list was established by PI's using focus groups and relates back to RDF subdomains – this will allow you not only to spot your strengths and weaknesses but identify which of the four domains are your strong suit and which ones you need to work on. You can

⁸⁵ <https://www.vitae.ac.uk/doing-research/leadership-development-for-principal-investigators-pis/developing-individual-researchers>

⁸⁶ <https://www.vitae.ac.uk/doing-research/leadership-development-for-principal-investigators-pis/developing-individual-researchers/performance-management-of-researchers>

⁸⁷ <https://www.vitae.ac.uk/doing-research/leadership-development-for-principal-investigators-pis/developing-individual-researchers/appraisal-of-researchers/the-appraisal-process-for-researchers>

⁸⁸ <https://www.vitae.ac.uk/doing-research/leadership-development-for-principal-investigators-pis/developing-individual-researchers/supporting-researcher-professional-development>

⁸⁹ <https://www.vitae.ac.uk/doing-research/leadership-development-for-principal-investigators-pis/developing-individual-researchers/supporting-researcher-career-development>

⁹⁰ <https://www.vitae.ac.uk/doing-research/leadership-development-for-principal-investigators-pis/developing-individual-researchers/mentoring-and-coaching-researchers>

⁹¹ <https://www.vitae.ac.uk/researchers-professional-development/about-the-vitae-researcher-development-framework/developing-the-vitae-researcher-development-framework>

⁹² <https://www.vitae.ac.uk/doing-research/leadership-development-for-principal-investigators-pis/developing-yourself-as-a-pi/skills-and-characteristics-of-a-pi>

also ask for feedback from your team (coach, mentor, supervisor, fellow researchers) – mirroring their opinion with your self-assessment will allow you to have a fairly objective understanding of your core strengths. Once this is done, you can write a self-development plan and monitor progress, including looking for formal and informal training opportunities.

Your plan for your own development might include some or any of the following:

- **Opportunity awareness:** gain a wider knowledge of the academic sector to identify, create, investigate, and seize areas for personal and professional development. Identify possible sources of information and support within your institution.
- **Decision-making:** understand your personal priorities and constraints (internal and external), so that each developmental opportunity and career step can be made following an informed decision. You need to be able to match these to your core skills, knowledge, values, and motives, etc.
- **Networking:** [develop networks of contacts](#).⁹³ You should be able to define, develop and maintain a support network for advice and information.
- **Self-presentation and promotion:** define and promote your own agenda. Promote your own strengths in a convincing way, for example using tools such as LinkedIn, X, podcasts, blogs, and vlogs – and of course scientific communications at conferences and internal events.
- **Goal setting and action planning:** move your career forward in a structured way through planning and implementing an effective course of action, organising time effectively and preparing contingency plans. You should be able to monitor and evaluate progress against specific objectives. Consider using the [RDF planner](#)⁹⁴ to structure this process.

⁹³ <https://www.vitae.ac.uk/doing-research/leadership-development-for-principal-investigators-pis/developing-yourself-as-a-pi/networks-for-pis>

⁹⁴ <https://www.vitae.ac.uk/researchers-professional-development/about-the-vitae-researcher-development-framework-planner>