Check for updates

ESSAY

REVISED Humanizing science: seven actions for PhD students to become next generation, future-proof scientists

[version 2; peer review: 2 approved, 2 approved with reservations]

Ingrid Valks[1], Dara Satrio[1], Angelica Reitsma[1], Katja Wolthers[1], Kris Dierickx[2], Kim Benschop[3], Dasja Pajkrt[1], OrganoVIR

[1]Amsterdam Medical Centre, Amsterdam, The Netherlands
[2]KU Leuven University, Leuven, Belgium
[3]Rijksinstituut voor Volksgezondheid en Milieu, Bilthoven, The Netherlands

v2 **First published:** 13 Oct 2022, **2**:119
https://doi.org/10.12688/openreseurope.15083.1
Latest published: 23 Oct 2023, **2**:119
https://doi.org/10.12688/openreseurope.15083.2

Abstract

PhD students, also referred to as the early stage researchers (ESRs), that were participating in the European Union's Horizon 2020 consortium, OrganoVIR, have the ambition to become top scientists in virology with innovative, animal-free, research models; organoids. To achieve this ambition, developing more self-confidence and resilience was used to strengthen personal leadership needed in such professional role. Towards this purpose, seven actions have been selected that guide the ESRs through their PhD journey and help them elevate their career perspectives and employability in the international labor market. In this essay, we share the seven personal development actions that have been carried out by the ESRs in the OrganoVIR H2020 Innovative Training Network (ITN) project, with the goal of demonstrating how training human skills can contribute to innovation and collaboration in European research. This article is an effort by OrganoVIR's Training and Education Committee to provide views on personal growth and leadership awareness.

Plain language summary

This article highlights the importance of including a personal development program in a research training program, particularly, one that employs PhD students. A survey conducted by *Nature* (2019) shows that PhD students work for over 40 hours every week and that they ranked their work–life balance as a main concern throughout their PhD project. Additionally, academic pressure, uncertainty, and the amount of workload also play a role in mental health problems amongst PhD students. PhD students struggling with mental health problems are reluctant to seek treatment. This is caused by the fear of stigma or the fear of potential negative impact it might have on their future careers.

Open Peer Review

Approval Status ✓ ? ? ✓

	1	2	3	4
version 2 (revision) 23 Oct 2023	✓ view			✓ view
version 1 13 Oct 2022	? view	? view	? view	? view

1. **Sara Cotterall**, Victoria University of Wellington, Wellington, New Zealand
2. **Liezel Frick**, Stellenbosch University, Stellenbosch, South Africa
3. **Basil Cahusac de Caux**, American University of the Middle East, Egaila, Kuwait
4. **Kim Brown**, University of Otago, Dunedin, New Zealand
Rachel Spronken-Smith, University of Otago, Dunedin, New Zealand

Any reports and responses or comments on the article can be found at the end of the article.

Supervised skill-building programs have shown to improve the lives of university students and to boost their professional influence (Conley *et al.*, 2015). These programs have helped minimize mental health problems such as anxiety and depression and can improve social and emotional skills. Within the OrganoVIR Personal Development Plan, OrganoVIR's PhD students, also known as early stage researchers (ESRs), were guided through seven actions to help them become the next generation of scientists. These actions include taking care of their personal well-being, achieving a better understanding of their purpose in life, discovering their own identity, having an excellent understanding of how values and beliefs impact internal and external communication, boost emotional competences, integrating insights in personal and professional life as well as experimenting with new leadership behavior, and recognizing and leading ethical dilemmas.

Keywords
Personal Development, Early Stage Researchers, Next Generation Scientists, Innovative Training Network

This article is included in the Research on Research gateway.

This article is included in the Horizon 2020 gateway.

This article is included in the Marie-Sklodowska-Curie Actions (MSCA) gateway.

Corresponding authors: Ingrid Valks (ingrid@thepoweroftimeoff.com), Dara Satrio (d.satrio@amsterdamumc.nl)

Author roles: Valks I: Conceptualization, Project Administration, Supervision, Validation, Writing – Original Draft Preparation, Writing – Review & Editing; **Satrio D**: Writing – Original Draft Preparation, Writing – Review & Editing; **Reitsma A**: Writing – Review & Editing; **Wolthers K**: Writing – Review & Editing; **Dierickx K**: Writing – Review & Editing; **Benschop K**: Writing – Review & Editing; **Pajkrt D**: Supervision, Validation, Writing – Review & Editing;

Competing interests: Ingrid Valks, the co-author of this essay, is the owner and initiator of the power of time off and the curator of the OrganoVIR personal development program. The power of time off has been invited by OrgaonVIR to design a personal development programme for the ESRs to deliver to society the next generation of scientists who are confident and resilient human beings who are a role model for being compassionate future-ready leaders in science. The personal development program is named BeyondU and is also available for businesses and other consortia or organizations in science. Ingrid Valks has no connections with organizations who will gain or lose financially from the online listing of this work. Ingrid Valks is not applying for any patents. Neither received fees or else for patent relating content. Ingrid Valks have not co-authored a paper with any of the authors of the paper in question in the past three years.

Grant information: This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 812673.
The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Copyright: © 2023 Valks I *et al*. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

How to cite this article: Valks I, Satrio D, Reitsma A *et al.* **Humanizing science: seven actions for PhD students to become next generation, future-proof scientists [version 2; peer review: 2 approved, 2 approved with reservations]** Open Research Europe 2023, **2**:119 https://doi.org/10.12688/openreseurope.15083.2

First published: 13 Oct 2022, **2**:119 https://doi.org/10.12688/openreseurope.15083.1

REVISED **Amendments from Version 1**

After revising the article based on the feedback given by the reviewers, we have made several changes to the article. Within the introduction we have provided several arguments on the importance of having a program that trains 'human skills' as such programs will help increase a PhD graduate's employability. Following this addition, we have also created a section that explains the need for training in human skills and the reason for the use of 'human skills' within the essay. Moreover, we added Figure 1 "Three biggest personal changes ESRs want to make during their PhD journey" in the section 'Going Beyond Science' to present the three biggest personal changes the ESRs wanted to make during the PhD studies. Additionally, Figure 2 "Human and Vitality Wheel by Valks in the BeyondU personal development program for OrganoVIR" was also added under the section 'Personal Development Plan' to present the seven actions that were taken to guide OrganoVIR's ESRs in becoming future-ready leaders in business and science. Finally, we have also considered the feedback given by the reviewers and have consulted various literature to support our claims and arguments within the article.

Any further responses from the reviewers can be found at the end of the article

Introduction

OrganoVIR is an EU Horizon 2020 Innovative Training Network (ITN) under the EU Horizon 2020 research program, coordinated by Dr. Katja Wolthers and Prof. Dasja Pajkrt. OrganoVIR's training program trains PhD students or Early Stage Researchers (ESRs) in the field of human organoids for virus research.

Over the years, human organoids have increasingly become an essential tool for virus research due to their ability to accurately mimic how human organs react to human viruses as well as antivirals. Understanding these interactions is a critical step to prevent viruses from spreading and ultimately, to develop treatments. Realizing its potential to transform the virology landscape, the OrganoVIR consortium trained ESRs to lead innovation in the field of organoids for virus research.

In the past, a high education qualification may have been sufficient for a PhD graduate's employability (de Weert, 2007), however, with changes such as increased globalization and increased job insecurity (Forrier & Sels, 2003; Fugate *et al.*, 2004; Sung *et al.*, 2008), PhD graduates can no longer rely solely on their education qualification. Furthermore, in an age of advanced technology and automation, the 'human' jobs that will remain will require individuals with critical thinking and collaboration skills – skills that machines currently do not fully have (Stirrett, 2017). PhD students will need to adapt to change and work towards achieving a competitive advantage over other graduates with similar academic backgrounds (Tomlinson, 2012).

The next generation of scientists

When the OrganoVIR project was created, Wolthers and Pajkrt recognized that it is important for the next generation of scientists to participate in a training program that covers the whole value chain, from laboratory to market. Developing and acquiring a combination of hard skills and soft skills will help PhD students to achieve a competitive advantage in the labour market (Clarke, 2017; Crossman & Clarke, 2010). With training that focuses on developing their soft skills, the next generation of scientists will become confident and resilient individuals who lead with compassion and are able to operate within commercial settings.

Thus, at the start of the OrganoVIR project, three skill-sets were defined: 1) technical skills and academic skills to become an academic researcher in virus research with organoids through the scientific training program; 2) managerial skills through the newly developed and tailored pre-MBA; and, most importantly, 3) human skills through the BeyondU Personal Development Plan. Human skills, also called life skills or soft skills, are personal-oriented skills that require a mind–body–heart connection. These are skills that enable a person to think clearly, to collaborate harmoniously in teams, and to lead people with compassion (Vasanthakumari, 2019).

In this essay, we will use the term "human skills" instead of "soft skills" as we believe that it provides a broad umbrella definition to describe a wide subset of characteristics to regulate emotions, act and react mindfully and be self-aware. These human skills, which can be developed outside formal learning and throughout life, are uniquely 'human' and are able to bridge the gap caused by robots and algorithms (European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience, European Commission, p.13, 2020). In this essay, we will be focusing on the third and final skill set; human skills developed through the Personal Development Plan (PDP).

Going Beyond Science

During the intake, we used Google Forms to ask OrganoVIR's 14 ESRs, who represent 13 nationalities, about their motivation to join OrganoVIR and what they would like to focus on in the next three years during their Personal Development Plan in two open questions.

As a result, we observed that there were three key factors that motivated these ESRs to join OrganoVIR: intellectual development and the opportunity to collaborate with an international team in academics and business, the opportunity to be mentored by experts from across Europe, and the training program that pays attention to self-development. Results showed that the ESRs would like to develop their self-confidence, understand themselves better, and maintain their well-being (Figure 1).

Through collaboration with *The Power of Time Off*, a consultancy firm for sustainable employability and conscious leadership, OrganoVIR implemented the BeyondU Personal Development Plan (BeyondU PDP). The PDP is focused on helping the ESRs achieve better performance, increase their professional influence by developing personal competences, and provide them with greater peace of mind. Under the guidance of Valks, an experienced Personal Development coach



Figure 1. Three biggest personal changes ESRs want to make during their PhD journey.

and founder of *The Power of Time Off*, OrganoVIR trained ESRs to become confident and resilient leaders in the field of virology as a result, providing them with a competitive advantage in the international labor market.

The PDP is a blended program that integrates different approaches to providing support for the ESRs' personal development which includes live, online through the e-learning platform and workshops, and off-grid educational experiences in nature. Throughout their PhD studies, OrganoVIR's ESRs were also provided access to support groups, peer groups (for instance, a philosophical café initiated by one of the ESRs), and individual sessions with their personal development coach. During these individual sessions, the ESRs were able to address their personal challenges. These sessions have played an important role in supporting the ESRs throughout their project.

The Personal Development Plan (PDP)

The BeyondU PDP is a program that is fully committed to developing human skills, personal competences, and practicing well-being as foundation skills for future-ready leaders in business and science. The program is based on the logical levels of Bateson (1972) and Dilts (1996), an analysis and change model that provides insight into the different levels of communication, change, and functioning and describes a systematic approach to change. Based on the hierarchy in the processes of learning, change, and communication formulated by Bateson (1972), Dilts (1996) defined six logical levels; purpose, identity, values and beliefs, emotional capabilities, behavior, and environment. The PhD students of OrganoVIR follow the modules in the PDP in the specific order recommended by Bateson and Dilts' model.

Within the PDP, a seventh action is added: practicing well-being as a foundation skill to take leadership of our own mental well-being and vitality. Due to the typical 21st-century challenges such as a desire for finding meaning in life, rapid changes, overload of work and information, time pressure and the uncertainty of our role as humans with the rise of technology, we also need to take leadership of our own (mental) well-being and vitality (Hougaard & Carter, 2018; Harari, 2019). The well-being modules align with the theory of both Scharmer (2009) and Judith (1987), who identify that humans need to connect on different intelligence levels such as physical, emotional, mental, and spiritual.

Together with the coach of *the Power of Time Off*, we explored the seven actions in the BeyondU personal development plan which includes the following: 1) taking care of your personal well-being; 2) achieving a better understanding of your purpose in life; 3) discovering your own identity; 4) having an excellent understanding of how values and beliefs impact communication; 5) boost emotional competences; 6) integrating insights in personal and professional life as well as experimenting with new leadership behavior; and 7) recognizing and leading ethical dilemmas. These actions are described in more detail below (Figure 2).

Action 1: Practice well-being as a foundation skill

It has been argued that personal well-being – defined by the Centers for Disease Control and Prevention (2018) as the presence of positive emotions, satisfaction with life, and positive functioning – is able to affect an individual's ability to recover their mental health after facing challenges (Stoffel & Cain, 2018). Practicing well-being as a foundation skill is key to improving personal resilience. The next generation of scientists must be physically, emotionally, and mentally fit to overcome challenges, stress, anxiety, and sometimes, loneliness in their way.

A survey conducted by Nature (Lauchlan, 2019) reported that 76% of PhD students worked more than 40 hours per week and that 79% PhD students ranked their work–life balance as a main concern throughout their studies. Aside from their work–life balance, there are other factors that affect the mental health of PhD students. These include the pressure to publish, a strain on relationships with their advisors, uncertainty and financial insecurity, the competitive academic job market, and workload (Levecque *et al.*, 2017; Mackie & Bates, 2019; Wyatt & Oswalt, 2013). The *Nature* survey also revealed that out of 6,320 PhD students, only 36% of these students sought treatment for mental problems such as anxiety and depression. According to the Organisation for Economic Co-operation and Development (2015), the reluctance to seek help for mental problems amongst PhD students is caused by the fear of stigma or the negative impact on their future careers.

A study by Conley *et al.* (2015) showed that skill-building interventions such as personal development programs can improve the lives of university students, reduce anxiety, stress, depression, and in improving social and emotional skills. Within the PDP, well-being modules were offered in the form of live masterclasses and virtual masterclasses (monthly e-vitality courses). The holistic approach of the well-being modules includes nature connection, meditation and breathing, nutrition, healthy lifestyle, stress relief, and learning to relax.

Following the completion of the OrganoVIR project and the PDP, ESRs were asked the fill in an evaluation survey. For one of the ESRs, the e-vitality courses reminded her of the importance of balancing her dream career in research and maintaining a healthy mindset. Additionally, to another ESR, the first action helped him not only to understand the importance of taking care of himself but also to address sources of issues from the workplace.



Figure 2. Humanity and Vitality Wheel by Valks in the BeyondU personal development program for OrganoVIR.

Action 2: Discover your purpose in life

As human beings, each of us has the drive to find meaning and significance in our lives that enables us to endure challenges (Frankl, 1963). Having a purpose motivates a person to dedicate their resources towards particular goals and to be more resilient to challenges and change (Kashdan & McKnight, 2009). Under the guidance of experienced personal development coaches in a live masterclass, OrganoVIR's ESRs identified and explored their purpose and passion in life.

According to Dhingra *et al.* (2021), when personal and organizational purposes are aligned, it will result in healthier, more resilient employees, stronger employee engagement, increased loyalty, and a higher willingness to recommend the company to others. Having a sense of purpose helps individuals to feel an increase in work gratification (Bonebright *et al.*, 2000), life fulfillment, well-being and happiness (Debats *et al.*, 1993; Zika & Chamberlain, 1992). This became apparent in times of uncertainties during the COVID-19 outbreak when many of the ESRs had limited access to their laboratories.

It is widely known that the COVID-19 pandemic has disrupted the scientific industry. As remote working grew popular for other occupations, studies showed a sharp decline in the amount of time scientists spent on research. For instance, in April 2020, a study found that scientists experienced a decrease of 7 hours in their laboratory compared to pre-pandemic (Gao *et al.*, 2021). Additionally, it has been argued that the pandemic had impacted female scientists, 'bench' scientists (scientists who require workbenches for work in the laboratory), and scientists with young children the most compared to other groups of scientists (Myers *et al.*, 2020).

Realizing their purpose can guide an individual through tough decisions and tough times and inspire them to move forward (Brassey *et al.*, 2021). By understanding their purpose, the ESRs were able to identify situations that were not beneficial to them or that do not contribute to their purpose, and to avoid these situations or delegate tasks where possible.

Action 3: share your identity with the outside world

The term *identity* refers to an individual's traits, attitude, cognitive behaviors, and experiences (Guenther *et al.*, 2020). There are two types of known identities; personal (otherwise known as individual) and social (Vignoles, 2018). During the PDP, personal development coaches guide OrganoVIR's ESRs to discover their identity through the masterclass 'the power of your voice', weekly online interactions, interactive assignments to help discover their identity, role model interviews, and finally, individual coaching calls.

By speaking more concisely and clearly, the ESRs were able to influence their audience more effectively; to convince them, to gain their attention during a presentation and to be recognized as an opinion leader. Personal coaching by an experienced personal development coach helps ESRs to turn

weaknesses into strengths, showing them factors that hinder their growth and development. With this new skill, ESRs were able to connect with themselves and have more impactful communication.

Within the third action, OrganoVIR's ESRs were taught the following lessons;

1. To become more aware of their proudest achievements, the things they like about themselves, and the things that give them joy. To listen to their inner voice and allow their senses to connect and build deeper human relationships, even through their computer screen during the pandemic.
2. To identify the most suitable tone of voice for themselves.
3. To become more self-confident and to step out of their comfort zone.

The aforementioned lessons were summarized based on answers provided by OrganoVIR's ESRs. Answers were provided anonymously through an evaluation survey.

Action 4: understand the impact of cross-cultural values and beliefs

Within an international environment, it is important to understand that different people have different values on a macro and micro level. Every country has their own special cultural thinking and values, otherwise known as a set of beliefs that serves as a guideline in an individual's life that affects the way an individual evaluates others and certain events in their lives (Kesberg & Keller, 2018; Zhao *et al.*, 2020). Hofstede's work, in which he conceptualized how 40 countries and cultures differ (Hofstede, 1983), is perhaps the best example to observe the differences of values among different cultures.

Often, miscommunications can occur during a cross-cultural interaction due to cultural gaps that neither parties are aware of (Carté & Fox, 2008). The fourth action within the PDP minimized communication gaps caused by cultural differences through increasing the ESR's awareness of cultural values and the impact of behavior and intercultural communication in an international work environment. During the masterclass 'Social patterns, cultural beliefs and the impact on our communication', which was carried out virtually due to the pandemic, ESRs were invited to take a closer look at values and beliefs in two levels; macro and micro.

Within the macro level, experienced PDP coaches guided the ESR to decode their own culture and their peer's cultures. During the online masterclass, the ESRs were encouraged to answer the question 'how does your, and others, culture communicate, persuade, trust, evaluate, disagree, decide, lead, and plan?'. Often, we are not fully aware of our cultural patterns and therefore we are not always aware of the impact of our behaviour on our foreign co-workers. The culture map of Erin Meyer (2014) was used throughout the masterclass as it focuses on how the world's most successful leaders navigate the complexities of cultural differences in a multicultural environment.

Moreover, on a micro level, the ESRs delved into their first interaction system, namely their family. During this masterclass, the ESRs analyzed their background and how it formed their identity and to recognize patterns and behaviors that were helpful to their personal growth.

Upon completion of the fourth action, OrganoVIR's ESRs anonymously reported the following lessons; 1) the ability to comprehend the differences between how high and low context culture communicates, 2) to be aware of the impact of their own communication style, and 3) motivation to become more assertive and confident in expressing their opinions.

Action 5: boost your emotional competences

Emotional intelligence, also known as emotional competence, is the ability to understand personal and impersonal emotions, to discriminate between different emotions, and to use emotional information as a guide to think and behave (Srivastava, 2013). Having high emotional intelligence can help individuals increase their productivity, ability to manage stress, and communication in specific scenarios (Serrat, 2017; Sinha & Sinha, 2007). Individuals who have ambitions to have a professional influence and a healthy, happy work life will benefit from having emotional competences.

Emotional competences are one of the defining characteristics of success in the workplace. To boost emotional competences, one must first begin with consciousness. Being aware of the present with a calm, focused, and clear mind will have a positive impact on the ESR's physiology, psychology, and work performance. Second, one must have compassion for themselves and for others. Having compassion means the act or capacity for having sympathy for the suffering of yourself or others together with the wish to alleviate it. Third, one must have the ability to create meaningful connections including with their own selves. Creating meaningful connections will help to be good listeners and be more attentive, which will ultimately improve our self-esteem, happiness, and well-being.

Much like the previous actions, the masterclass for the fifth action could not take place live due to the pandemic and therefore was carried out online. As a result, Valks provided the ESRs with weekly online learning content about Emotional Intelligence. Additionally, the ESRs were given the opportunity to participate in online retreats provided by the power of time off. The holistic approach of the virtual retreat calendar includes three courses to develop emotional intelligence, manage vitality and improve work-life balance: 1) mind training, 2) nature connection, and 3) stress relief and (learn to) relax.

Action 6: work and lead from your future-self

To become a 21st century leader in science, ESRs will need to embrace the challenges they face in today's world. New, more human-focused, leadership starts with embodying well-being, developing personal competences, and leading

from the future. During this module in the personal development plan, the ESRs reflect on their insights and learnings throughout their PDP journey. Sharing answers to questions such as "What have I already integrated in life and at work" and "What did I let go, what behavior am I experimenting with?".

Furthermore, the ESR's behavior is the vehicle that takes them to what they would like to achieve in life. Since they were the initiator of their behavior, the ESRs were guided, during this PDP module, through a process in which they see themselves with a new perspective.

Action 7: recognize moral dilemmas and demonstrate moral courage

Through the final action in the PDP, OrganoVIR's ESRs were encouraged to focus on their personal and professional environment. Within these environments, dilemmas will arise, and decisions must be made. To make a suitable decision, a good moral compass and moral courage is required. Therefore, ESRs were trained to identify and to lead conversations about ethical dilemmas in a seven-step-approach (Loyens *et al.*, 2008). To demonstrate moral courage, ESRs learn to bridge the gap between thinking and doing.

The seventh action of the PDP is conducted in two sessions of masterclasses. In the first session, a step-by-step plan for moral inter-vision is provided to move from thinking and talking towards doing in difficult situations. The step-by-step plan or the moral inter-vision model is a tool that organizes and provides insight into the decision-making process in difficult situations and thus ensures that the conversation goes beyond exchanging experiences and giving spontaneous comments.

The model consists of 7 steps or 7 questions and forces some tempo delay, creating space to question the obvious. The model certainly also has room for emotions. An emotion is an 'advocate', an emotion indicates that something is at stake that we consider important and a response is needed.

The final session completes the circle of the BeyondU leadership program. Our purpose, identity, values, beliefs and emotional competences influence how we experience difficult situations. With the help of this masterclass, OrganoVIR's ESRs discovered and learned how to deal with ethical dilemmas and to arrive at a moral solution.

Upon evaluation, 4 out of 14 ESRs claimed that the seventh action helped them recognize the importance of addressing sources of issues in the workplace and to demonstrate the courage to implement learnings from this action.

Conclusion

Understanding people and creating connections, including with ourselves, is one of the most important aspects for PhD students to become a human and a future-proof scientist. PhD students who are well developed in their personal competences and who practice well-being as a foundation skill can take leadership of their personal and professional life. With its goal to develop the next generation of scientists to become the innovative leaders of tomorrow, OrganoVIR understands the need for a personal development program and has therefore incorporated the BeyondU Personal Development Plan into its training program. In a world of constant change, we must navigate our scientists to be ready for 21st century challenges by providing a program that advances their human skills. Only then, when scientists have developed their human skills, will we be able to humanize science.

Ethics and consent

Ethical approval and consent were not required.

Data availability

No data are associated with this article.

Acknowledgements

We would like to thank all ESRs of the ITN project OrganoVIR for their trust and engagement in the BeyondU program and for sharing their insights and lessons learned: Emilia Barreto Durán, Asli Aybike Doğan, Igor Lopes Coqueiro, Georgios Stroulios, Louisa Wallace, Laurensius Kevin Lie, Inés García Rodríguez, Giulia Moreni, Thuc Nguyen Dan Do, Fatma Masmoudi, Andrew Barnhart, Ciro Esposito, Nânci Ferreira and Louise Bondeelle.

References

Bateson G: **Steps to an ecology of mind.** Ballantine, New York, 1972.
Reference Source

Bonebright CA, Clay DL, Ankenmann RD: **The relationship of workaholism with work–life conflict, life satisfaction, and purpose in life.** *J Couns Psychol.* 2000; **47**(4): 469–477.
Publisher Full Text

Brassey J, De Smet A, Kothari A, *et al.*: **Future proof: Solving the "adaptability paradox" for the long term.** McKinsey & Company, 2021.
Reference Source

Carté P, Fox C: **Bridging the culture gap: A practical guide to international business communication.** Kogan Page, 2008.
Reference Source

Centers for Disease Control and Prevention: **Well-Being Concepts.** Centers for Disease Control and Prevention. October 31, 2018.
Reference Source

Clarke M: **Rethinking graduate employability: the role of capital, individual attributes and context.** *Studies in Higher Education.* 2017; **43**(11): 1923–1937.
Publisher Full Text

Conley CS, Durlak JA, Kirsch AC: **A Meta-analysis of Universal Mental Health Prevention Programs for Higher Education Students.** *Prev Sci.* 2015; **16**(4): 487–507.
PubMed Abstract | **Publisher Full Text**

Crossman JE, Clarke M: **International experience and graduate employability: stakeholder perceptions on the connection.** *Higher Education.* 2010; **59**(5): 599–613.
Publisher Full Text

Debats DL, Van der Lubbe PM, Wezeman FR: **On the psychometric properties of the Life Regard Index (LRI): A measure of meaningful life: An evaluation in three independent samples based on the Dutch version.** *Personality and Individual Differences.* 1993; **14**(2): 337–345.
Publisher Full Text

de Weert E: **Graduate Employment in Europe: The Employers' Perspective.** In: *Careers of University Graduates. Views and Experiences in Comparative Perspectives.* edited by U. Teichler, Dordrecht: Springer, 2007; 17: 225–246.
Publisher Full Text

Dhingra N, Samo A, Schaninger B, *et al.*: **Help your employees find purpose-or watch them leave.** McKinsey & Company, April 5, 2021.
Reference Source

Dilts R: **Visionary Leadership Skills.** Capitola, CA: Meta Publications, 1996.
Reference Source

European skills agenda for sustainable competitiveness, Social Fairness and Resilience. European Website on Integration. 2020.
Reference Source

Forrier A, Sels L: **The Concept Employability: a Complex Mosaic.** *International Journal of Human Resources Development and Management.* 2003; **3**(2): 102–124.
Publisher Full Text

Frankl VE: **Man's search for meaning: An introduction to logotherapy.** New York:Washington Square Press, 1963.
Reference Source

Fugate M, Kinicki AJ, Ashforth BE: **Employability: A Psycho-Social Construct, its Dimensions, and Applications.** *J Vocat Behav.* 2004; **65**(1): 14–38.
Publisher Full Text

Gao J, Yin Y, Myers KR, *et al.*: **Potentially long-lasting effects of the pandemic on scientists.** *Nat Commun.* 2021; **12**(1): 6188.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**

Guenther CL, Wilton E, Fernandes R: **Identity.** In: Zeigler-Hill, V., Shackelford, T.K. (eds) *Encyclopedia of Personality and Individual Differences.* Springer, Cham. 2020; 2136–2145.
Publisher Full Text

Harari YN: **21 Lessons for the 21st Century.** Harvard Business School Publishing - Harvard Business Review Press, 2019; 29–30.

Hofstede G: **National Cultures Revisited.** *Behavior Science Research.* 1983; **18**(4): 285–305.
Publisher Full Text

Hougaard R, Carter J: **The Mind of the Leader: How to Lead Yourself, Your People, and Your Organization for Extraordinary Results.** Harvard Business Review Press, 2018.
Reference Source

Judith A: **Wheels of life.** Llewellyn Publications, 1987.
Reference Source

Kashdan TB, McKnight PE: **Origins of purpose in life: Refining our understanding of a life well lived.** *Psihologijske Teme.* 2009; **18**(2): 303–316.
Reference Source

Kesberg R, Keller J: **The Relation Between Human Values and Perceived Situation Characteristics in Everyday Life.** *Front Psychol.* 2018; **9**: 1676.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**

Lauchlan E: **Shift Learning Nature PhD Survey 2019.** *Nature.* 2019; 2.
Reference Source

Levecque K, Anseel F, De Beuckelaer A, *et al.*: **Work organization and mental health problems in PhD students.** *Research Policy.* 2017; **46**(4): 868–879.
Publisher Full Text

Loyens K, Maesschalck J, Wijnen T: **Het bevorderen en ontwikkelen van een ethisch klimaat in de organisatie. De rol van dilemmatrainingen in een integriteitsbeleid.** In: *Praktijkboek kwaliteitszorg in welzijnsvoorzieningen.* Politeia; Brussel. 2008; 837–854.
Reference Source

Mackie SA, Bates GW: **Contribution of the doctoral education environment to PhD candidates' mental health problems: A scoping review.** *Higher Education Research & Development.* 2019; **38**(3): 565–578.
Publisher Full Text

Meyer E: **The culture map: breaking through the invisible boundaries of global business.** First edition. New York, PublicAffairs. 2014.
Reference Source

Myers KR, Tham WY, Yin Y, *et al.*: **Unequal effects of the COVID-19 pandemic on scientists.** *Nat Hum Behav.* 2020; **4**(9): 880–883.
PubMed Abstract | **Publisher Full Text**

OECD: **Fit Mind, Fit Job: From Evidence to Practice in Mental Health at Work.** Mental Health at Work. OECD Publishing, 2015.
Publisher Full Text

Scharmer CO: **Theory U: Leading from the Future as It Emerges.** Berrett-Koehler Publishers, 2009; **1**(2).
Publisher Full Text

Serrat O: **Understanding and Developing Emotional Intelligence.** In: *Knowledge Solutions.* Springer, Singapore, 2017; 329–339.
Publisher Full Text

Sinha S, Sinha D: **EMOTIONAL INTELLIGENCE AND EFFECTIVE COMMUNICATION**. 2007.
Reference Source

Srivastava K: **Emotional intelligence and organizational effectiveness.** *Ind Psychiatry J.* 2013; **22**(2): 97–99.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**

Stirrett S: **It's human skills – not technical skills – that we need the most in today's work force.** The Globe and Mail. August 8, 2017.
Reference Source

Stoffel JM, Cain J: **Review of grit and resilience literature within health professions education.** *Am J Pharm Educ.* 2018; **82**(2): 6150.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**

Sung J, Chi Man M, Loke F, *et al.*: **The Nature of Employability Skills: Empirical Evidence from Singapore.** *Int J Train Dev.* 2008; **17**(3): 176–193.
Publisher Full Text

Tomlinson M: **Graduate Employability: A Review of Conceptual and Empirical Themes.** *High Educ Policy.* 2012; **25**(4): 407–431.
Publisher Full Text

Vasanthakumari S: **Soft skills and its application in work place.** *World Journal of Advanced Research and Reviews.* 2019; **3**(2): 66–72.
Publisher Full Text

Vignoles V: **Identity: personal AND social.** University of Sussex. Chapter. 2018.
Reference Source

Wyatt T, Oswalt SB: **Comparing mental health issues among undergraduate and graduate students.** *Am J Health Educ.* 2013; **44**(2): 96–107.
Publisher Full Text

Zhao G, Han Y, Zhang Y: **The Influence of Cultural Values on International Business Management and Related Activities.** *Modern Management Forum.* 2020; **4**(2): 47.
Publisher Full Text

Zika S, Chamberlain K: **On the relation between meaning in life and psychological well-being.** *Br J Psychol.* 1992; **83**(Pt 1): 133–145.
PubMed Abstract | **Publisher Full Text**

Open Peer Review

Current Peer Review Status: ✔ ? ? ✔

Version 2

Reviewer Report 06 November 2023

https://doi.org/10.21956/openreseurope.17990.r35766

© **2023 Brown K.** This is an open access peer review report distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

✔ **Kim Brown**
University of Otago, Dunedin, Otago, New Zealand

I would like to approve this version and thank the authors for their attention and willingness to incorporate feedback.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Doctoral education; transferable skills; inclusion.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 27 October 2023

https://doi.org/10.21956/openreseurope.17990.r35768

© **2023 Cotterall S.** This is an open access peer review report distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

✔ **Sara Cotterall**
School of Linguistics and Applied Language Studies, Victoria University of Wellington, Wellington, Wellington, New Zealand

I have read the revised article and am impressed at the extent to which the authors have improved the original draft.

Although I couldn't read Figure 2 because it was too small, I appreciated that they justified their focus on the ESR's personal skills by including reference to aspects of their research context and

research lives. This, for me, was essential to contextualise the study. I also appreciate that they included one or two examples of participants' reflections on the programme and how it had helped them.

The only suggestion I would make is that they acknowledge how out of date Hofstede's work on cultural difference in the workplace is, and how discredited it has become. They could do this, for example, by saying something like - "although it has been criticised by some, Hofstede's original finding that...holds true" - or something like that.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Doctoral education, Higher education, Language teacher education, Language learner autonomy, Language learning strategies

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 19 June 2023

https://doi.org/10.21956/openreseurope.16311.r32326

© 2023 Brown K et al. This is an open access peer review report distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

?

Rachel Spronken-Smith
[1] Higher Education Development Centre, University of Otago, Dunedin, Otago, New Zealand
[2] Higher Education Development Centre, University of Otago, Dunedin, Otago, New Zealand

Kim Brown
[1] University of Otago, Dunedin, Otago, New Zealand
[2] University of Otago, Dunedin, Otago, New Zealand

1. This article could do more to clearly establish why, within the field of doctoral science study, it is beneficial to include a personal development program. The program sounds very interesting, but as noted by previous reviewers, more literature is available to robustly ground the assertions made in the article. Please cite Lauchlan (2019) as the author of the Nature survey report.

2. I agree that the term ‘human skills’ feels somewhat disconnected to the aims suggested. While the company that delivers the program uses the term ‘human skills’, within the field of doctoral research, ‘transferable skills’ is more commonly used. In this case, the particular subset of transferable skills being discussed are personal competencies and wellbeing skills. The research of Senekal, Munnik and Frantz (2022)[1] provides some guidance on personal

resourcefulness as part of expected doctoral attributes, and is worth considering.

3. It is not clear in the article whether authors are justifying their decision to include a personal development programme (which I applaud on a personal level), or whether they are arguing that such a program should be part of doctoral education for scientists in the 21st century, for which they do not present sufficient evidence. The reporting of the program switches verb tense between Action 2 and Action 3, suggesting that perhaps the program was underway but not complete at the time of writing? Related to this, it is unclear how actions 2, 4 and 5 are actually developed – what are the activities? Some clarity on the argument would help readers decide on whether sufficient evidence has been provided for the claims made in the conclusion.

4. The article certainly has potential to contribute to the cultural and social understanding of the field of personal development and wellbeing during doctoral study within the particular historical context that we find ourselves, pre- and post-pandemic. Inclusion of a greater range of data (participants' quotes as suggested) would enhance the contribution this essay can make. If the authors have the capacity to do so, a longitudinal study of the cohort would be particularly helpful to the field of doctoral academic development.

References

1. Senekal J, Munnik E, Frantz J: A systematic review of doctoral graduate attributes: Domains and definitions. *Frontiers in Education*. 2022; **7**. Publisher Full Text

Is the topic of the essay discussed accurately in the context of the current literature?
Partly

Is the work clearly and cogently presented?
Partly

Is the argument persuasive and supported by appropriate evidence?
Partly

Does the essay contribute to the cultural, historical, social understanding of the field?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Doctoral education; transferable skills; inclusion.

We confirm that we have read this submission and believe that we have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however we have significant reservations, as outlined above.

Reviewer Report 13 June 2023

https://doi.org/10.21956/openreseurope.16311.r32325

© 2023 Cahusac de Caux B. This is an open access peer review report distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

?

Basil Cahusac de Caux
[1] American University of the Middle East, Egaila, Kuwait
[2] American University of the Middle East, Egaila, Kuwait

This essay is a welcome attempt at raising awareness of the needs of doctoral candidates beyond the hard skills they develop through (multi)disciplinary research and supervision. However, it would benefit from a number of amendments:

1. The work should be more concretely grounded in the literature on doctoral candidates. There are numerous papers, monographs, and edited books that deal specifically with the kinds of skills that doctoral candidates should develop, ways to develop such skills, and the necessity of fostering these skills in the first instance.

2. Reconsider your use of the term 'human skills', as it is too broad and has no real precedent in the literature. I recommend substituting it with the term 'transferable skills', as it represents practically the same set of skills you describe in your essay.

3. Given the small sample size (14 ESRs), it would be nice if you dedicated some space to the voices of your cohort. This would not only provide the reader with qualitative insights, but would also be good use of data that you have probably already generated. Doing this would lend more weight to the claims you make regarding 'self-reported [...] improvement in their mental wellbeing, happiness, concentration', etc.

4. While you hint at the impact of the pandemic, due to the wholesale closure of labs and research facilities, it would be remiss of you not to mention the impact of the pandemic on 'the new generation of scientists'. There is plenty of literature on this. You can consult journals such as The International Journal of Doctoral Studies and edited books published by Springer (e.g. Research and Teaching in a Pandemic World).

In addition to the above, there are a number of minor points that can be addressed. For instance, mention the year of publication immediately after the Bateson and Dilts citations (page 3). Add a visual representation of the Bateson (1972) and Dilts (1996) models to page 4. I also recommend adding a reference/ citation upon first mention of Action learning. Action 5 reads like a textbook description of mindfulness...is it? If so, cite one or two sources in the literature on mindfulness and doctoral candidates. Please also expand on Action 7, as it is too short in its current form. Please also use terminology consistently throughout your essay. For instance, you refer to your cohort as ESRs (early stage researchers) in most sections of the essay, but in the Conclusion you switch to PhD students. I would unify these two terms (as ESRs or PhD students -- the choice is yours).

Lastly, there are some grammatical and stylistic issues that can be easily addressed by proofreading the essay.

Is the topic of the essay discussed accurately in the context of the current literature?

Partly

Is the work clearly and cogently presented?
Partly

Is the argument persuasive and supported by appropriate evidence?
Partly

Does the essay contribute to the cultural, historical, social understanding of the field?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Sociology of Higher Education, Sociology of Language, Doctoral Studies

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 01 June 2023

https://doi.org/10.21956/openreseurope.16311.r31480

© 2023 Frick L. This is an open access peer review report distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

?

Liezel Frick
[1] Department of Curriculum Studies, Stellenbosch University, Stellenbosch, Western Cape, South Africa
[2] Department of Curriculum Studies, Stellenbosch University, Stellenbosch, Western Cape, South Africa

The article presented here is timely and relevant to the researcher careers and development community at large. The comments provided are aimed at helping the authors develop this work towards a more defendable contribution.

1. There is a growing body of literature that could support the argument which seems to have not been consulted - see for example the work of LERU working reports and the Wellcome Trust within grey literature, and the work of Kirsi Pyhalto and colleagues on researcher careers in STEM areas, as well as that of Karri Holley.

2. The notion of 'action learning' is currently under-theorised, while there is a wealth of literature emanating from both the managements sciences and education on the topic.

3. In order to make sense of the findings, readers would benefit from more detail on how the data was construed and interpreted in order to get to the seven actions presented here.

This would make the study more defendable and rigorous.

4. How does the BeyondU PDP programme compare/differ to other similar programmes? What are the shortcomings of the programme? What are possible implications for policy, practice and future research?

Is the topic of the essay discussed accurately in the context of the current literature?
Partly

Is the work clearly and cogently presented?
Partly

Is the argument persuasive and supported by appropriate evidence?
Partly

Does the essay contribute to the cultural, historical, social understanding of the field?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Doctoral education

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 22 May 2023

https://doi.org/10.21956/openreseurope.16311.r31477

© 2023 Cotterall S. This is an open access peer review report distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

?

Sara Cotterall
[1] School of Linguistics and Applied Language Studies, Victoria University of Wellington, Wellington, Wellington, New Zealand
[2] School of Linguistics and Applied Language Studies, Victoria University of Wellington, Wellington, Wellington, New Zealand

This essay addresses a critical issue that affects large numbers of PhD candidates and Early Stage Researchers (ESRs) worldwide: a marked increase in the levels of anxiety, stress and other mental health issues they experience. Given the high stakes nature of doctoral research, however, this issue is not always adequately acknowledged or addressed by research institutions. Consequently, research into ways of supporting the personal development of doctoral researchers together with their existing research skills training is essential.

However, personal development training of the type reported in this essay is not the only means of providing support. Other approaches include encouraging ESRs to establish and participate in (online) support groups (Panayidou & Priest, 2021[1]; Elliot & Makara, 2021[2]; Pretorious *et. al*., 2019[3]), enhancing the supervisory relationship (Wollast *et al.,* 2023[4]), and using writing networks to build confidence, boost motivation and support identity building (Aitchison & Guerin, 2014[5]). It would have been good to locate the approach adopted in this study in the context of other well-researched approaches.

The account provided of the intervention delivered in this study raises a doubt about the extent to which the training was aligned with the particularities of the doctoral researchers' contexts. First, the analysis and change model (Bateson, 1972; Dilts, 1996) around which the intervention was organised did not appear to relate specifically to the specialised word of academia. The stress experienced by many doctoral candidates (and junior members of academic research teams) is triggered by factors such as the pressure to publish, funding issues, crises of personal confidence, power dynamics in supervision or research teams, time management problems, intercultural communication concerns, personal financial issues and family roles and responsibilities. Many of these stressors are peculiar to the academic research environment, and to the identity-related aspects of becoming a scholar. Consequently, they warrant particular attention.

Second, it is difficult to determine the precise **nature** of the intervention because few details are provided. Instead, the bulk of the essay is devoted to reporting the **content** of the programme, detailing the seven very broad Actions (e.g., Discover your purpose in life) recommended in the Personal Development Plan. It would have been helpful to see an example of how one of these Actions had been presented, explored and trialled (?) in the participating ESRs' respective research contexts.

This paper would be more valuable for early stage researchers, their supervisors and more senior colleagues and researchers in the field of doctoral education if it were developed along the following lines:

1. Provide examples of the online learning tasks that formed part of the PDP intervention;

2. Include details of the action learning projects that participants were invited to complete;

3. Present sample materials from the wellbeing modules.

4. Incorporate feedback from some/all of the ESRs who completed the programme.

In relation to the final point above, I was left wondering what the 14 Early Stage Researchers thought about the intervention. In other accounts of interventions to support ESRs' wellbeing, the PhD candidates' voices are often allocated as much space as the authors' description of the intervention itself. In the absence of participant evaluations, in this case it is difficult to judge the extent to which the programme met the interpersonal needs of the participants.

References

1. Panayidou F, Priest B: Enhancing postgraduate researcher wellbeing through support groups. *Studies in Graduate and Postdoctoral Education*. 2021; **12** (1): 42-57 Publisher Full Text
2. Elliot D, Makara K: An online community of international scholars: Enabling spaces for reciprocal academic and psychological support. *Innovations in Education and Teaching International*. 2021; **58**

(6): 693-703 Publisher Full Text
3. Pretorius L, Macaulay L, de Caux BC (Eds.): Wellbeing in Doctoral Education: Insights and Guidance from the Student Experience. *Springer Singapore*. 2019. Publisher Full Text
4. Wollast R, Aelenei C, Chevalère J, Van der Linden N, et al.: Facing the dropout crisis among PhD candidates: the role of supervisor support in emotional well-being and intended doctoral persistence among men and women. *Studies in Higher Education*. 2023. 1-16 Publisher Full Text
5. Aitchison C, Guerin C (Eds.): Writing Groups for Doctoral Education and Beyond: Innovations in practice and theory. *Routledge*. 2014.

Is the topic of the essay discussed accurately in the context of the current literature?
Partly

Is the work clearly and cogently presented?
Yes

Is the argument persuasive and supported by appropriate evidence?
Partly

Does the essay contribute to the cultural, historical, social understanding of the field?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Doctoral education, Higher education, Language teacher education, Language learner autonomy, Language learning strategies

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.