The power of ODDE:
Is it equal to the challenges of the SDGs?

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Abstract

The open, distance and digital technologies are powerful systems for transforming the value and reach of education. This article considers the extent to which they can be deployed in service of one of the greatest educational challenges we have represented in the UN Sustainable Development Goals (SDG). The paper argues that since SDG4 for education asks for 'quality lifelong learning for all', universities have a role in contributing to achieving this goal, especially with respect to professional development for sustainability. If the UN goals are to be achieved, the current situation needs to be assessed. Currently the impact of top-rated universities on sustainability is less than the expected level of excellence. In addition, the contribution of universities, in general, is limited to basic updating of skills and knowledge, which is needed across the professions, but a bigger contribution to lifelong professional development is a higher need. The paper outlines several reasons why universities should make a more significant contribution to this, e.g. that we generate significantly more new knowledge needed to meet the goals. It also shows that the ODDE technologies, especially MOOCs and digital tools, can be deployed successfully to scale up our impact on the radical changes needed in the actions of professionals in all sectors. Finally, it proposes an SDG professional development strategy as one pathway to the solutions that are needed.

Keywords

ODDE, UN Sustainable Development Goals, lifelong learning, professional development, MOOCs

1 Introduction

The specific challenge this paper addresses is the UN Sustainable Development Goal 4 (SDG) for education that asks for 'quality lifelong learning for all'. The three types of education we focus on in this journal - open, distance, and digital - define the characteristics of a form of education that possesses a potential to address some of the greatest challenges of our time, defined in the SDGs. All three are necessary to achieve the inclusivity and the reach that will engage the professionals and practitioners across the world who are called on to change and improve their current practices. As an example, Goal 17, Partnerships for the Goals, is to ensure that no-one is left behind, so reach and inclusivity are key. Conventional place-based education beyond school is not sufficient. The challenge requires partnerships between governments, the private sector and civil society, so it is situated at the broadest macro-level system.

Knowledge of the changes needed has already been developed to some extent for some of the goals through the usual channels of science and scholarship. But unfortunately, the global north seems to dominate in this area and has limited receptivity to the voices of the global south, and even to many of the voices in its own member states and communities. There are other types of knowledge to be revealed, local knowledge - of the pragmatics of professional practice, or the idiosyncrasies of local implementation, or the unexpected consequences of the science-driven choices (Marginson et al., 2021; Santos, 2007).

Thinking about the role of universities in contributing to the SDGs, we can claim some impact through our global research partnerships and practices, and through our work as educators of tomorrow's workforce. However, the SDGs will be delivered by changes in the practices of the billions of professionals and employees at all levels of almost every organisation on the planet. The education of the future workforce itself is a massive challenge. Should our work extend to professional development[1] of the current workforce as well? We claim to have a good proportion of the scientific knowledge needed. We have the ambition, as our mission statements and values attest. And we have the technologies – Open, Distance, and Digital Education (ODDE) – capable of reaching most people already and accelerating towards ever greater coverage faster than SDG4 will achieve universal basic education through physical schools. We clearly have a role to play in developing the initial and ongoing skills of the 44 million new teachers needed by 2030, and there are few other sectors whose workers are not implicated in the need for more sustainable practices[2]. Quality lifelong learning underpins all the other 16 SDGs as well. They challenge all the people who must change their policies, practices, and actions now, if we are to meet the UN goals.

The educators are at the centre of the *microsystem* identified as part of the ecological systems framework (Bronfenbrenner, 1979), where learners and teachers are interacting with the forces in the *mesosystem* as the wider social structures impacting on them (Pherali et al., 2020), and within the *macrosystem* of the wider political, cultural, economic, and legal systems interoperating across the world (Bond et al., 2023). The framework applies equally to the context of professionals in all sectors, and their individual professional development (PD). All professionals are embedded

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[1] The term 'professional development', as the further development of current professionals' capabilities, is contrasted with 'professional education', as the education of current students aiming to become professionally competent.

[2] Quality education for 'learning societies' at
https://news.un.org/en/story/2024/02/1147067#:~:text=The%20world%20urgently%20needs%2044,championing%20education%2C%20announced%20this%20week

within the same kind of ecological system. Universities as educational institutions are part of the meso system, facing in both directions, responsible for educating individuals and for the global systems of knowledge production.

The educational responsibilities are considerable. The programme for quality lifelong learning is measured and it is estimated that by 2025, 50% of all employees will need reskilling, driven by technology and digitalization, as well as sustainability. Jobs in the education industry could increase by 10%, representing 3 million additional jobs for vocational education and university teachers (World Economic Forum, 2023). Set in this context, the few dozens of courses on SDGS for professionals on, for example, Coursera, EdX, and XuetangX, the largest MOOC platforms, will have minimum impact. A recent analysis of the lack of 'ICT' solutions in the field concludes that "In the absence of sound professional development, the SDGs and the 2030 Development Agenda may not be achieved successfully in building a pathway which is more resilient and sustainable" (Havea et al., p. 10).

But the challenge is not insurmountable. The argument in this paper is that the nature of ODDE can contribute to the solution. The technologies of large-scale MOOC platforms and interactive digital tools for participants, have the potential to meet the multiple challenges of the SDGs, but the power to change lies within the meso and macro systems and we must understand better how to find the pathways to that power.

2 The role of universities in meeting the challenges of the SDGs

Universities certainly believe they have the power to change the world for the better, if we consider their vision and mission statements:

- ...aspires to generate and harness knowledge and skills for the benefit of today's and future generations... pursuing the central questions confronting humanity [Heidelberg University]

- Our vision is to be a world-class university that works to understand, explain, and improve our world and the human condition. [Lund University]

- ...engaged with the wider world and committed to changing it for the better... for the long-term benefit of humanity. [University College London]

- world-class research and education... which benefit society on a local, regional, national and global scale... [University of Oxford]

- …able to create and pass on knowledge for a responsible shaping of our common future. [University of Stuttgart]

- ...solving the problems of the world, we aim high. We want to give direction to necessary transformations. We see the university as a catalyst for change. That is the contribution we want to make to society. [Utrecht University]

These European representatives of a worldwide trend are clearly organisations that aim to make a significant impact on making the world a better place and would feel considerable responsibility to help in meeting the SDGs. However, in the alternative 'impact' rankings of universities' sustainable development practices in 2023[3] none of these, nor any of the top-rated twenty universities in the overall excellence rankings, appear anywhere near the top twenty for

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[3] THE Impact rankings 2023, https://www.timeshighereducation.com/impactrankings

impact on the SDGs. In general, these universities have yet to achieve both excellence and impact of this kind.

Perhaps this is not surprising. As Marginson and Xu point out, using the university rankings based on bibliometric data makes us "complicit in the fiction that the knowledge stored in the commercial repositories of Web of Science and Scopus is all that needs to be known" (Marginson & Xu, 2021, p. 5). Instead, they advocate an 'ecologies of knowledge' approach, where "knowledge-as-intervention-in-reality is the measure of realism, not knowledge-as-a-representation-of-reality" (Santos, 2007, p. 70).

The idea is derived from the recognition of

> the wealth of knowledges that have been preserved, the ways of life, symbolic universes, and wisdoms for survival in hostile conditions that are based entirely on oral tradition... Doesn't the fact that none of this would have been possible through science tell us something about science? (Santos, 2007, p. 71).

The point is to promote "the interaction and interdependence between scientific and nonscientific knowledge" (Santos, 2007, p. 70). There is still respect for conventional scientific knowledge, and the idea that not all truths have equal status, but it does mean that "structural mechanisms of exclusion are discarded. Openness is crucial." (Marginson & Xu, 2021, p. 31).

Research already operates openly and collaboratively across international boundaries, but in the traditions of scientific research the current hegemony of some in the global north prevents the alternative knowledges of the supposed beneficiaries of that research, from being heard.

Many universities are developing their policies on equity, diversity, and inclusion for their internal practices, and this must include research, although research practices reach well beyond the institution itself. They are subject to the precepts of ethical scholarship, which is where we look for a critical approach to how we do research. What are the new forms of research practice that would enable a more open approach to alternative voices and their critiques of our current practices and the policies that surround them? Could we imagine a 'pluriversity', for example, to replace the assumptions of the universality of scientific knowledge:

> … a process of knowledge production that is open to epistemic diversity. It is a process that does not necessarily abandon the notion of universal knowledge for humanity, but which embraces it via a horizontal strategy of openness to dialogue among different epistemic traditions (Mbembe, 2016, p. 37).

Just one characteristic of the macro-level conduct of the global system of international research serves to exclude different epistemic traditions: the significant dominance of the English language. How do universities address that problem, and find a pathway to reform?

We must look at what kinds of change might be capable of that – and ODDE clearly has a part to play. The next section considers what the impact data are showing us, and how to use these measures for reform in the context of ODDE and its research. The argument for why universities should be considering these issues must also be made, as the basis then for a realistic plan for using ODDE as part of the reform of university education and research practices

3   What counts as impact for SDG4 Education?

The Times Higher Education (THE) Impact rankings for universities are useful as a counter to the overall research-oriented rankings because they are derived using a very different methodology,

with no reliance on research citations[4]. They began only in 2019 so may still need further development to be fair to all national systems, but they define a significant improvement on the research-based rankings. The indicators used provide comparisons across the four areas defined as:

Research: the most obvious and traditional way that a university might help to deliver the SDGs is by creating research in relevant topics.

Stewardship: how employees, faculty and students act as stewards of their resources is one of the key factors in delivering the SDGs.

Outreach: work that universities do with their local, regional, national and international communities is another key way they can impact on sustainability.

Teaching: teaching plays a critical role, both in ensuring that there are enough skilled practitioners to deliver on the SDGs, and in making sure that all alumni take forward the lessons of sustainability into their future careers.

Each SDG is given a set of metrics the university must report on, annually. All 17 SDGs are scored for the areas above, as well as for an overall score and ranking. Research metrics are supplied by Elsevier, supplemented by AI, and narrowing the scope of the publications to those relevant to each SDG. The 11 Elsevier metrics for Quality Education, for example, include several where ODDE could make a significant difference:

1. Graduates with a teaching qualification – to assess scale of impact, including online
2. Free access to educational resources – for access to preparatory certification, including online
3. Vocational training for the public – inclusive access for all, including online
4. Education outreach activities beyond campus - inclusive access for all, including online
5. Lifelong learning access policy – to ensure access to all, regardless of ethnicity, religion, disability, immigration status or gender
6. Proportion of first-generation students – widening access via wholly online degree courses

These are the key metrics where ODDE can improve on campus provision in terms of quality of engagement, duration, flexibility, and scale, to improve access to higher education (HE) for a wide range of otherwise disadvantaged learners, from undergraduates to professionals.

All universities, including those doing well on excellence of research, could deploy the use of ODDE methods to significantly improve their scores on these measures. The changes are not radical because they are needed anyway for their campus students, i.e. making optimal use of the online platforms they are using already; and providing professional development for their own staff to assure the quality of the digital education methods being used.

To achieve the impact on sustainability, therefore, we need to consider how technology can help, and in particular, for this journal, how the ODDE technologies can help. One critical issue for education institutions is how to run online degree-level programmes that are high quality, flexible, and meet the impact measures on a large scale, while still being affordable.

The ODDE methods are still underused in HE, even though online learning since the pandemic has acquired a new respectability as so many education professionals across the world discovered its advantages, including its capability to deliver high quality teaching and learning. However, it

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[4] https://www.timeshighereducation.com/world-university-rankings/impact-rankings-2023-methodology

is not yet generally well understood in terms of its true teaching costs and learning benefits. For strategic change this is important and is part of the proposal in Section 5.

4   Why should universities contribute to professional development?

If universities have to cope with an expansion in higher education, and with redeveloping curricula to cope with the needs of the future workplace due to changes in technology, then why should they also be contributing to the upskilling and professional development of the current workforce? Why not let industry do it?

Universities already contribute, to some extent. In the UK at least, the university sector currently offers some 4.4m days per year, which at ~£500/day is a contribution of £2bn per year (University UK, 2021), while industry records the great majority of what is done, investing £42 billion (including the wage costs of those on training) in skills in 2019 (Crowley & Overton, 2021). At present, therefore, universities see it as appropriate to contribute a small fraction of the training and upskilling of the workforce. However, given the scale of the changes to practice implied by the collective demands of the SDGs, which require lifelong learning that goes beyond routine updating, a rather larger contribution will be needed, for several reasons.

One is a simple financial reason. There will be increasing demand from industries and public services for help with the scale of this task, creating a potential long-term income stream for universities.

The second relates to our research. Engagement with research output is crucial if professionals are to be able to critique and redevelop their practices. One quid pro quo for university researchers is that they must demonstrate impact and value to their research funders, especially if they hope to achieve further funding. Closer collaboration between university research and professional communities would help the private sector and civil society to use the latest findings to adapt more quickly to changing needs. Another quid pro quo is that if we take an inclusive approach to collaborating with professional communities on their needs, they become partners in the research. Beginning by finding out what they need, working through the research findings with them, and listening to the improvements they propose, and also to the techniques that do not work and the further needs they create, are important contributions to the research itself (Pherali et al., 2020).

A third reason is that universities do have the technology to offer large-scale professional development across the world, and many are already using it for online courses for students, in a slow digital transformation of our systems. The systems for students tend to be institution-based, but many of the top-rated universities are also partners with MOOC platform providers (Marin et al., 2023). These massive large-scale formats are not suitable for students at any stage, as they need personalized support and nurturing while still developing their knowledge and high-level skills. They may be used alongside conventional degree programmes to great effect, but they cannot be sufficient. For professionals, MOOCs are very well designed: they offer flexible, short courses, at low cost, the added value of discussions with knowledgeable and experienced peers, valuable resources, and practical digital activities. The value to the university is the reach on a very large scale to people who have no other form of access to such engagement with research. If universities are serious about changing the world, this is a fitting medium to serve that ambition.

A fourth reason is that an SDG professional development strategy would match our mission statements, and improve our THE Impact rankings, for which inclusive learning is key. There is still the barrier of the digital divide that excludes many communities and social groups, but this

is changing slowly, from a penetration rate of internet users of only 27% in East Africa as the region least well-served, to over 70% for the great majority of regions in the world, with the least developed countries nearly doubling the number of internet users between 2019 and 2022[5]. Our human organizational systems that exploit the internet make progress at an insufficient pace to meet even the current access levels, but the penetration of access in the worst cases will still cover most of the professionals and workers that such a plan needs to reach. The digital divide is no reason to stop exploiting the internet if we can use it to create more inclusive knowledge development.

One further reason for universities taking responsibility for professional development for sustainability is the potential for an expansion of the Citizen Scientist (CS) model. This is essentially a participatory model for engaging with research, especially that relating to the SDGs. Five types of 'citizens' have been identified within the relevant context of sustainability transitions research as: citizens representing the public, active citizens, community members, particular citizens, and citizens represented by NGOs (Huttunen et al., 2022). Of these our interest here is in the latter four groups, who can be expected to take an active role in using the research they are engaged in for the interests of their groups. It is also important to note that 'citizen' is an unfortunate designation in contexts such as migrant communities, where the community members of interest are emphatically not citizens. Nonetheless, they may be active in any one of those four groups. The essence of this kind of participation in research is the two-way exchange between the participants and the researchers and would include methods such as: action research with a citizen jury; workshops; action research including living labs and experimentation; focus groups; participatory mapping/modelling; and participant observation (Huttunen et al., 2022). One key advantage of the CS methodology, and similar action-oriented participatory, co-design and engaged scholarship methods, is that the participants' capacities were also enhanced by learning by doing, which provided a way for knowledge exchange in real life situations" (Huttunen et al., 2022, p. 7)

Knowledge exchange within and beyond the communities in focus means that the local value of solutions and discoveries can travel and be shared, so that community knowledge can develop across countries alongside consensual scientific knowledge.

For universities, there is further value in the learning experienced by their researchers, who are able to understand more about the impact and potential, as well as the inadequacies of their current research output "learning processes were often seen as mutual, involving researchers, citizens and potentially also other stakeholders" (Huttunen et al., 2022, p. 7)

This speaks to the second reason above for universities being interested in professional development. For the CS methodology as well, being able to demonstrate beneficial impact is an important currency for researchers who are dependent on funding bodies that have to demonstrate their own contribution to the public good.

This valuable review article shows that the CS methodology is still relatively underdeveloped, because the impact value lies in 'integrating local and practical knowledge', and in the 'empowerment and learning' of the communities themselves, whereas for many of the studies covered, there was inadequate attention to ensuring the follow-through to these effects. This was primarily because they needed "a deeper attempt to shift the institutional power dynamics of knowledge production", due to the tendency for the researching institution to dominate the

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[5] https://www.statista.com/statistics/269329/penetration-rate-of-the-internet-by-region/

interactions and the ownership of resources (Huttunen et al., 2022, p. 8). The full articulation of the CS methodology must recognise and address this.

An SDG professional development strategy would be beneficial to universities in the basic financial ways in addition to simply aligning our actions with our mission statements. These statements also align with the interests of research academics who are themselves concerned with contributing to the public good as the primary vocational motivation for their particular field of interest. The argument for why universities should contribute to professional development for sustainability is clear

5 The use of ODDE for an evidence-based SDG professional development strategy

With this analysis of the current roles and responsibilities of universities with respect to professionals' capacity-building for sustainability, this section proposes the ways we should exploit the ODDE technologies to address the question at the end of Section 2, to build an SDG professional development strategy. This would allow us to develop the new forms of research practice that facilitate access to research projects to alternative voices and the ways they could critique current practices and findings from the perspectives of the professionals and end-users whom the research would affect.

5.1 Strategies

To understand what is needed at the meso, and hence the macro system levels, it is important to represent the analysis of what is needed at the micro level in a form that enables the individuals and organisations at the meso level to act. The previous section proposed an SDG professional development strategy, which would begin at the mesosystem level of university strategy, and could be developed as follows:

- Overall goals
  - Align the university's practices with its mission and values.
  - Achieve the scale of impact on improving professionals' practices towards sustainability that is capable of building to the scale of the demand.
  - Develop an affordable business plan for contributions to professional development for sustainability in the organisations relevant to our research outputs.
- Analyse
  - the research outputs that are most critical to sustainability, and prioritise the professionals and end-users whose capabilities will drive changes to practice most efficiently as the audience for the PD.
  - the use of ODDE technologies, MOOC platforms and additional digital tools, that would serve the most inclusive audiences and foster the optimal exchange and development of diverse, professional knowledge in each field.
  - the partners and stakeholders to be involved in the design, development and evaluation of the PD offerings.
  - Estimate and provide the resources needed for the portfolio of PD offerings.
- Design
  - the intended audiences and stakeholders to engage in the co-design of each offering.
  - the curriculum, pedagogies, forms of assessment and certification for each offering.

- the types of knowledge production that can be articulated and curated by and for the communities involved.
- Plan the development, testing, and implementation of each offering.
- Evaluate the outcomes in terms of value creation for participants, their knowledge production and curation, affordability, and the scale of reach.
- Iterate the process to continually improve the outcomes with respect to the overall goals.

The first three elements are the responsibility of the mesosystem level of the senior management and funding providers in collaboration with the researchers. The final four stages act at the microsystem level of the individual research teams, their partners, stakeholders, and prospective professionals and other participants. The researchers are responsible for facilitating the impact of new knowledges and practices relating to the SDGs, and for creating PD offerings that are demonstrably beneficial to the participants, make an impact on changes of practice, create and curate community knowledges, are affordable, and have large-scale engagement with the intended audiences, i.e. the professionals, in the relevant sectors, across the world, who need to change their practices in the service of sustainability.

5.2   Technologies

The scale is extensive, but we do have the technology. Many of the top-rated universities in the world have now become partners with MOOC providers, and a few have developed their own platform. The pre-existing online education platforms, Virtual Learning Environments (VLEs), being institution-based, restricted engagement to the universities' enrolled students. The new platforms offered the great attraction of surpassing the reach of VLEs by supporting 'massive' enrolments from students across the world (Bozkurt et al., 2017). The potentially significant educational effects were exaggerated to the point of fantasy as promoters thought they could foresee teenagers anywhere in the world now being able to access a top-rated university education: fantasy, because the very nature of the massive reach ruled out any hope of the kind of individual nurturing that students all through university need. There was no viable financial model, other than unwisely hopeful investors, as the other great attraction was that courses were free at the point of use. Paid-for certificates of completion generated a small fraction of the income against the considerable cost of creating and delivering the courses. In any case, completion was very low, as drop-out cost nothing and there was only personal motivation creating the pressure to complete. So, there were inevitable losses for the universities, despite the other types of value conferred.

MOOCs received negative coverage following the over-hyped initial years, and yet despite their challenging business models use of these platforms is still accelerating [6] . These ODDE technologies are important because they can achieve quality and equity at scale, but not for students, who will always need the individualized personal support that university courses provide. In old technology terms, a MOOC combines a public library with a book club. This is not an education (Kalz, 2023). However, for professionals who have already developed their knowledge and skills and can judge what more they need, these short, open, online courses offer a flexible and authoritative lifeline for the millions who have no access to high quality professional development opportunities. While MOOCs can be an excellent supplement to a university degree course, they are emphatically not a solution to inadequate higher education provision for young adults; they do not democratize higher education (Kalz, 2023).

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[6] https://www.edsurge.com/news/2021-12-28-a-decade-of-moocs-a-review-of-stats-and-trends-for-large-scale-online- courses-in-2021

If we accept that MOOC platforms are not a full solution for university students, it is important not to overplay their disadvantages, because they do offer so much for professionals: reach to anyone anywhere with internet access, flexibility, authoritative learning, certification, and if there is good use of discussion, access to the ideas and solutions from their peers. The overwhelming need is there. A report on the need for large-scale teacher professional development, for example, reviewed over 100 articles and reports on 'learning at scale' from 2008 to 2017, identified three actions needed to progress equity, quality and efficiency for this kind of professional development (Laurillard et al., 2019), on

- technology – to bridge the extensive digital divide,
- pedagogy – teachers being able to own and develop the digital pedagogy innovations that will continue to be needed as digital innovations progress, and
- community – shared and localized versions of generic principles of practice.

MOOC platforms go a long way towards a workable solution for the latter two actions, the former being a political issue, but one that is improving every year. Because community sharing is very important, a platform that does not simply offer a discussion area, but also encourages meaningful peer discussion at each step, is essential. TPD courses on FutureLearn, for example, where every step expects commentary and discussion, and supports participants in finding each other, create a greater sense of being part of a community (Dingyloudi et al., 2019; Kennedy et al., 2019). This enabled a specific format to be co-designed, with members of the prospective audience and stakeholders, as a 'co-designed massive open online collaboration', a CoMOOC, not just a course. It is designed to emulate the way science and scholarship use the academic journal system to enable teachers to build on each other's work through 'collaborative activities', and so create transformative learning experiences even in the most challenging of environments (Pheral et al., 2020).

As the main goal is to help professional communities in any walk of life to develop and share knowledge of how to change their practices to improve sustainability, the digital technologies of knowledge production, representation and sharing must be embedded in the design of any PD. They will vary according to the topic and the type of representation it needs. It may be simple text, but contributed texts must still be curated somewhere, and MOOC platforms do not offer hosting. The university responsible can host on their own servers, for example. Without this openness to the knowledge of the participants, the reach to such inclusive audiences will fail to "foster the optimal exchange and development of professional knowledges" and the aim of improved professional practices.

The relevant ODDE technologies at this microlevel, therefore are the CoMOOC that fosters the exchange and development of community knowledges, and the relevant digital tools for the topic, deployed within the online environment, such as a learning design tool for teachers (Kennedy et al., 2019), or interactive games for renewable energy professionals[7], or the wide range of generic digital tools such as Padlet, Menti, etc., which enable participants to express and share their ideas (Weller, 2023).

The deployment of these technologies will help to address the first two goals of the strategy, alignment with the mission, and achieving scale. The third goal of funding is at the meso level of action, and that will include enabling access to large-scale platforms. The technologies will also address the final two tasks of the Analyse and Design elements.

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[7] https://www.futurelearn.com/courses/sustainable-energy-access-for-communities

5.3   The business plan

At the meso level, therefore, senior management will develop an affordable business plan for the PD offerings, including prioritising the research areas for PD, and estimating the resources needed. They will collaborate with the research staff on this, as they need to understand what is needed to release the capacity for innovation and change from the knowledge situated in the business, industry and civic sectors they will engage with.

Following the proposal in the previous section, if they are to use the scale of a MOOC platform, they will need to make the case for partnering with one of the platform providers. Their existing VLE will severely restrict the scale of reach, but the partnership fees of some $10,000s will only be worthwhile if they plan to run at least three offerings per year. Most platforms enable the use of external digital tools and environments, so that existing choices in current courses can be used.

The business plan is the most challenging aspect because university funding models for teaching and learning have often derived from legacy models for in-person methods, rather than digital methods. The result is that the financial modelling carried out for a senior team may seriously underestimate the initial high fixed costs of development, but also seriously underestimate the long-term returns from high numbers while over-estimating the much lesser variable costs of delivery (Kennedy et al., 2024b). Being massive, MOOCs do not incur the variable costs of supporting students, because participants are not supported as individuals, so teacher time is much lower. On the other hand, it is important for the design to motivate completion as well as payment for certificates, due to the low cost of dropout for these participants (Bozkurt et al., 2017; Kennedy et al., 2015;), unlike that for normal university courses.

Estimating the resourcing of online PD offerings, whether conventional or MOOC-based, requires a rethink of university financial modelling for teaching and learning. To use ODDE technology effectively it is essential to understand the relationship between teaching costs and learning benefits (Laurillard, 2007; Robinson, et al., 2016). We need new requirements for a twenty-first-century course costing tool commensurate with the new demands and opportunities (Kennedy et al., 2024a), to

- provide an equal and consistent analysis of both conventional and digital methods,
- represent the benefits to participants of the different methods,
- estimate both development and support costs of teaching the different methods,
- estimate the differential effects of participant numbers and group sizes,
- track teacher time over several runs, instead of on an annual basis.

MOOCs differ from accredited university courses in many ways: they use no conventional methods, there is no teacher support for group or individual work, and there could be many runs within a single year. The cost of videos can be high, but they need to be short (up to 5 minutes), so for a short course they need not be expensive, and may even be shot on smart phones, especially in authentic locations. Conventional financial modelling of teaching does not cope with these complexities. A recent estimate of the fully costed staff time needed to develop and run a 3-week CoMOOC[8] during lockdown, showed that supporting 12 hours study minimum, using a total of ~30 minutes video, with an average of 8 mentors for each run, to attract 22,000 enrolments over 12 consecutive runs, cost a total of €50,000, or 3€ per active learner (17,000). The return on paid-for certificates from 2% of participants was €11,000, after the 50% share to FutureLearn for hosting. At this scale, the return is not commensurate with the cost. This underlines the importance of some degree of marketing that goes beyond what the platform itself can do, and

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[8] https://www.futurelearn.com/courses/blended-and-online-learning-design

which during lockdown was not feasible. Marketing is a cost that is often not attributed to individual university courses, so is not represented in legacy financial models. However, the total cost of provision is very nearly the same if the participant numbers can be raised to, say 100,000 enrolments, which is feasible, and does break even. Alternatively, a 20% take-up of the certificate of completion would yield an even higher return. This is also feasible and was achieved by one of the UCL MOOCs on Perioperative Medicine[9], partly because the key professional societies were collaborators and because the clinical sites where participants worked greatly valued the certification, which is much less true of the schools the former MOOC spoke to (Laurillard et al., 2019).

An affordable business model can be achieved, therefore, but only under conditions where the success factors such as quality of design, recruitment and engagement of the target audience, and collaboration with key partners, as well as the learning benefits and teaching costs of ODDE technologies are fully understood and acted on.

5.4   Inclusivity

Inclusivity means listening to the experience and knowledge of the people who are engaged in the normal practices of their sector, and who know they need to change these practices.

Engagement with the target audience during the design process is essential if the CoMOOC is to succeed in addressing the key problems experienced by those professionals, and in being able to respond to their responses to the research findings being discussed. The approach calls on some of the ethical principles of 'social movement' research (Kalz, 2023) and of 'social movement learning' (Pherali et al., 2021), researching the process of knowledge production in social movements. It has theorized the interrelationships between three types of knowledge production: Grassroots, Academic, and Organisational, and the care needed to understand how each must communicate with the others to succeed in a common goal, i.e. not just through their practiced methods, but also through, e.g. an NGO serving as a school for promoting learning for struggle, or popular education to challenge unequal political structures, or the academics supporting the NGOs in running seminars and publishing about their work, broadening the learning to relate to peer groups elsewhere, by finding "new avenues of convergence among the struggles of diverse ethnic and social communities to overcome reactionary manipulation by dominant groups" (Pherali et al., 2021, p. 164).

If a research-originated CoMOOC is to succeed in being inclusive of all the professionals and community leaders that need this contact, the conditions for their engagement must be part of the ethical procedures our universities already enforce for research. They include the principles of ethical scholarship, such as: Do no harm. Try to challenge the status quo. Ask yourself moral questions. Strive to protect the vulnerable. Think, connect things, and deliver in different ways. Try to reach the streets. Reimagine a remaking of the world. Advocate for justice. Speaks truth to power[10]. University ethical procedures do not typically engage with such an approach.

In trying to reach the widest possible audience, of course, the digital divide becomes important. We cannot solve the digital access problems from within academe, but we can recognize the importance of variable pricing for offerings that travel to many different countries. Forty percent of our FutureLearn participants come from Low- and Middle-Income Countries (LMICs), so the

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[9] https://www.futurelearn.com/courses/perioperative-medicine

[10] Proposed by Sherin Idais, in Panel 2: Networks of Solidarity beyond Academia, in the seminar on The Politics of Decolonial Investigations and the Ethics of Solidarity 19 March 2024, Institute for Global Prosperity, UCL.

single price of a certificate for all participants makes its products exclusive of the many professionals who are in most need of its support (Bruhn-Zass, 2023).

5.5   Governance

The macrosystem already offers an important framework. The UN agencies produced the SDGs, which are a wise guide, and enable a collective response to the extraordinary challenges our world presents. However, the challenges have worsened since the last articulation of them in 2015, through disease, war, political decay, and all the human-driven disasters of recent years. The UN progress chart for 2023 shows 40% stagnation or regression for SDG4 Quality Education, for example[11]. For every goal, the changes needed at the microsystem level will only flourish with the support of the meso and macro systems. Universities have considerable influence in both (Brown, 2023). We develop a lot of the knowledge needed, and we have the ODDE technologies needed for engagement, argument, and knowledge elicitation, investigation, representation, interrogation, production, and sharing.

The macrosystem brings together the leaders and decisionmakers of both private and civic organisations, but its members will not themselves engage in using ODDE technology. Having little experience of it, they will be unlikely to recognize its significance for addressing the challenges they all face. It is the responsibility of the actors in the mesosystem, therefore, to help them think this through at whatever level of governance they practice. To foster the appropriate collaboration between academia, communities of professionals, and governance, there are some critical actions they could take (Laurillard, 2024):

1. Institutional governance bodies to negotiate and ensure teacher professional development to engage their teaching staff across all disciplines in effective innovation in digital pedagogy
   - to achieve optimal use of ODDE technologies.
2. Institutional leaders and managers to learn from academics and departmental planners building a better understanding of how teaching costs and learning benefits balance in different ways when deploying both conventional and online methods.
   - to manage effective business planning for the use of ODDE technologies
3. Institutional governance to promote the provision of large-scale professional development as a priority for contributing to the SDGs.
   - as this paper argues
4. Institutional leaders to build an adaptive network model of communication and change to enable governance to be rapidly responsive to new and developing knowledge among teachers and researchers.
   - and to achieve the inclusivity needed for successful impact.

The pathways to action at this level are probably the most difficult to achieve.

6   Concluding points

The articles in this journal will contribute significant value to meeting the challenges of the SDGs, because ODDE technologies are critical to making the difference needed. It is categorically infeasible to engage the world's professionals in the changes of practice that these goals demand without making effective and optimized use of all the communicative, collaborative and

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[11] https://unstats.un.org/sdgs/report/2023/progress-chart/Progress-Chart-2023.pdf

modelling technologies we have that can support understanding, new skills, and knowledge development and exchange on such a scale.

This paper has first outlined the arguments to support a proposal for universities to rise to the occasion of the challenge that professional development at scale presents, and then considered some of the pathways to enacting that change. Given the stagnation and regression in the journey so far, it is imperative to instil a sense of urgency about this discussion. ODDE has the potential to be equal to the challenge of the SDGs, but its power is limited to the human actors who populate its ecosystem.

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