

# Rooting for Robots through Pragmatic Pedagogy



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## *Title slide*

Thank you for the invitation to speak at the Unisa International Conference on Teaching and Learning. As noted, the title of my paper is Rooting for Robots through Pragmatic Pedagogy. I will reflect on recent work at COL and elsewhere.

## *Slide 2: Overview*

I want to begin with a personal reflection on a recent encounter with robots and then think about why I might want to use such technology, what I would want to use it for, where it is already being used and by whom.

## *Slide 3: I, robot*

The title of this paper is inspired by a recent visit to The Sphere, in Las Vegas, where I met three robots. The first robot could hold a conversation within a limited framework. The second could hold a more open-ended conversation with someone addressing them by name. The third robot could hold a conversation in multiple languages, with the listeners hearing a different language depending on where they were standing in relation to the robot. This got me thinking about how these robots could assist with teaching.

## *Slide 4: A pragmatic perspective on pedagogy*

The starting point for me, in thinking about how robots could help, is to first think about why I might need help and how. I have a somewhat eclectic approach to thinking about the why and the how. We do not have a single overarching theory for learning, but I have found the various successive theories each provide some new insight. I do think learning and teaching are situated activities and we have to respond to what we find ... for example in a recent workshop on microcredentials I co-planned and co-facilitated in Fiji, I realised early on that some of our assumptions about participant's knowledge was wrong and we needed to adapt our strategy accordingly ....

### *Slide 5: Nine guiding principles*

In a separate discussion I have been having with Som Naidu, we have been exploring a principle-based approach to planning and facilitating learning ...

1. Teachers and learners are clear about the learning outcomes.
2. Learning is situated within a meaningful context and within the culture and the community in which learners live and work.
3. Learners are engaged in pursuing and solving meaningful and real-world challenges and problems, and where they have opportunities to work on a variety of problems and tasks of increasing complexity with timely and useful feedback.
4. The learning activities in these learning situations are clearly articulated and explicitly linked to knowledge and skills already mastered.
5. Learners, while working on learning situations, are required to think for themselves by reflecting in and upon their actions and regulating their own performance.
6. The development of understanding is promoted as a social process with learners acting upon authentic situations in groups and with dialogue, discussion, and debate.
7. The assessment of learning outcomes is closely aligned with the learning context.
8. The assessment of learning outcomes is linked to meaningful problems and tasks, and aimed at helping students further develop their knowledge, skills, and problem-solving abilities.
9. The assessment of learning outcomes is designed to develop self-regulatory and meta-cognitive skills.

### *Slide 6: The 'pedagogy' wheel*

Once we know what we want to teach, why and how, there is no shortage of technologies to choose from. The latest version of the pedagogy wheel provides some examples ... but as the creator noted in 2015, it's not about the technology, it's about the pedagogy ...

### *Slide 7: GEM 2023*

But it is also about the context – what technology is best used for what pedagogic purpose in a particular context given the continuing digital divide ...?

### *Slide 8: A pragmatic perspective on technology*

So, I also have a pragmatic approach to use of technology. In many countries we still need to make provision for content that can be printed and/or shared digitally to a basic device at a wifi-enabled centre, especially for the more rural areas. But we can enrich the core content with for example, video and audio content – whether using broadcast technology or embedded in an open textbook for learners with higher end devices but limited access to the internet, We might then also need a version that is fully online, exploiting H5P for interactivity and including online discussion for a, which could be synchronous and non-synchronous, as well as involving social media. I call this Moodle cubed (different versions for different contexts but ensuring the complete curriculum is covered for all learners in the least technology-enabled contexts). We also made extensive use of

MOOCs during the pandemic (although not always massive and often not really open), and like you, we are exploring the use of AI.

***Slide 9: Elimu TV, Kenya***

Sometimes we still need to make use of traditional methods such as television or radio broadcasting...

***Slide 10: Outreach Nigeria***

And sometimes the school must go to the girls - A combination of printed-bite size resources, solar-powered narrow-casting, and use of local languages in a community outreach by motorbike in Nigeria.

***Slide 11: OER***

So, for example, we recently worked with six countries to develop and share digital curriculum-based content which could be shared offline using a device like COL Aptus – noting that the related capacity-building had a positive impact also on teacher development more generally ... but we also created a multi-country course on climate change that could be printed, shared digitally or put into an LMS for blended or online provision. In fact, it is a COL strategy to ensure that any course content we develop should be available for others to revise and re-use.

***Slide 12: Pacific Open Courses***

For example, the Pacific Open Courses developed by COL are repackaged and re-offered by USP, and others, and allow for multiple entry and exit points with different levels of recognition for achievement, through digital badges and/or partial or complete digital certification. The challenge then is how we might change such microcredentials from non-credit-bearing to credit-bearing at institutional, national or regional levels.

***Slide 13: UKOU & Microcredentials***

The UK Open University has taken this a step further. They make sample courses available for free which lead to recognition of learning. But, if students choose to subsequently register for the full programme to which they are related, they can get credit for the work completed. This can help reduce the numbers of students dropping out of our programmes because they chose the wrong course.

***Slide 14: Open Textbooks***

We are also currently supporting NAMCOL and CENDLOS to develop open textbooks as a way of making their course content available outside of their online platforms ... this is currently based on Pressbooks.

***Slide 15: AI & Khan Academy***

But what about AI? Khan Academy has been using this kind of approach for many years. Learners work through activities and earn badges for motivation. A dashboard shows them how, with each

small achievement, they progress towards the completion of the whole. Within a few minutes a group of learners will each be following a different trajectory through the course content in a way that is not easily replicated by a lone teacher in a physical classroom. Moreover, the backend tutor functionality allows the tutor to check progress and provide further individualised feedback where needed ... often only a small % of students need this personalised human engagement.

### ***Slide 16: AI review***

The latest 7th edition of research on AI concludes:

- AI beats humans on some tasks, but not all.
- Robust and standardised evaluations for LLM responsibility are seriously lacking.
- The data is in: AI makes workers more productive and leads to higher quality work.
- Scientific progress accelerates even further, thanks to AI.
- People across the globe are more cognizant of AI's potential impact – and more nervous.

Perrault & Clark (2024), 7th edition.

### ***Slide 17: Stoker – an early adopter of AI***

Stoker (2024) a LINC instructor for ISS of BC regularly uses Chat GPT in his work. He notes it has helped reduce the time needed for planning, assessment design, differentiation, analysis of what worked and what did not so that changes can be made before a topic is taught again, and that over time, working with the application, it has learned what he likes and makes increasingly useful recommendations.

Stoker (2024) also observes that AI has been used to support learning in multiple contexts ranging from Georgia State University, which in 2013 introduced AI to identify and automate feedback to students who were at-risk, linking them directly with a human tutor where indicated, to schools in rural India which developed AI tools for tablets to provide feedback to students on their subject-based learning. In both cases resulting in improved retention and success. He notes that Singapore even experimented with humanoid robots to provide support for learners whose teachers were off sick. He notes that AI in the classroom could take care of a lot of routine tasks freeing the teacher to spend more time interacting directly with students.

### ***Slide 18: Samoa AI***

In similar vein, COL has collaborated with the National University of Samoa (NUS) to conduct a pilot project on providing online learner support using GPT-powered technology for Moodle, which is the LMS used in NUS.

COL and NUS organised a webinar with staff and faculty members at NUS to brief them on the features of the system and how to use the chat interface as well as the GPT-powered help desk. The technology includes human interaction in the loop with AI.

In the three-week pilot, participants had the opportunity to explore the system and sent over 300 messages in one week. The results were assessed in a post-pilot survey and revealed high to very high levels of user satisfaction.

Professor Ioana Chan Mow of the Department of Computer Science at NUS served as the lead for the NUS team. She says, “NUS faculty and staff are excited and greatly appreciate this collaboration with COL on the AI-powered Moodle help desk. The AI-automated help desk will greatly reduce the workload of the ICT help desk section and will improve the timeliness of responses to Moodle queries. NUS thanks COL for its continued support over the years. We are excited to be the first institution in the Pacific to trial this AI-powered technology.”

### ***Slide 19: USP AI***

The Commonwealth of Learning (COL) and the University of the South Pacific (USP) have successfully enhanced the Semester Zero programme of USP. This programme, designed to help prospective students transition smoothly into university life, now incorporates advanced GPT 3.5-turbo technology. This integration has significantly improved the learning experience, allowing students to learn from the safety, convenience and comfort of their own homes.

The programme notably assisted 2,588 active participants, effectively handling over 619 queries related to course content and operational information, demonstrating the potential for integration of AI in educational settings in the Pacific. A survey of learners revealed that the AI experience was highly satisfactory. This effort not only facilitates a smooth transition to university life but also encourages the effective use of AI tools among students in the Pacific region.

### ***Slide 20: GAI: A pragmatic response***

- Use AI “intelligently”
- Automate routine admin and teaching tasks
- Find a balance between personalised support and over-dependence
- Support students and teachers to use and critique AI responses
- Focus on authentic assessment
- Address cybersecurity and academic integrity
- Consider digital twins or avatars
- Make ethical uses of analytics
- Provide CPD for teachers
- Create an imagination for what could be

Bates, 2024; Du, et al., 2024; Kizilcec, 2024; Law, 2024; Sevnarayan & Potter, (2024); Williamson, 2024

### ***Slide 21: Rooting for Robots***

In short, I’m rooting for robots to help teachers with planning, differentiating, providing routine feedback and managing admin etc., so that teachers can focus more on human-human interaction and engagement.

### ***Slide 22: Working together***

And instead of trying to navigate the way ahead in silos, we need to bring to bear our collective human intelligence to work out how best together as they have started to do in Europe. We are in Africa after all, and in Africa we know that for the long journey it is far better to travel together.

### Slide 23: References

It used to be that we should try to limit our references to the past 5 years. Then it became the last 3 years. With the explosion of GAI, it feels like our references should be the last 5 minutes!

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*Slide 24: Thank you*