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Beyond Button-Pushing: Navigating the Evolution of Educational Technology and Professional Development

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It is the year 2044, and Prof Alexa Khumalo is a distinguished academic in the Engineering Faculty at a leading virtual university.

As the sun rises on a new day, Prof Alexa awakens, not to the sound of an alarm, but to a gentle drumming crescendo orchestrated by her AI assistant who analysed her playlists of the past and identified a song she frequently listens to in the morning. The walls of her room are fitted with several seamless smart screens. They gradually illuminate, simulating a sunrise within the 3-bedroom home she shares with her partner and their 17-year-old son. She catches a glimpse of her day's agenda as it is projected onto one of the panels. A marathon of duties awaits!

She groans audibly when she sees her body's morning stats, projected on another panel. The wall never lets her forget that she needs to do more exercise to assist with her latest medical diagnosis: High blood pressure!

With a quick tap on her smart device, Prof Alexa's living quarters transition smoothly into an interactive gym, where she engages in a personalised physical workout. The AI trainer monitors and corrects her form, and tailors the exercises to energise her body and stimulate her mind.

Post workout, she puts on lightweight VR glasses and steps into her home pod, a compact space filled with sensors and haptic feedback devices that transport her to the University's virtual campus. After a quick scan of her virtual campus dashboard, she reviews the day's lectures, and checks in on her students' progress reports that were generated by the AI teaching assistant overnight. The reports not only track academic performance but also measure student engagement and emotional well-being.

Before the first class, Prof Alexa meets up with Dr Sarah Mokgatle, her young learning design colleague, to bounce ideas around about how she can get her students to

comprehend the challenging concepts of stress distribution and compressive forces. Even though Dr Sarah speaks Sepedi, and Prof Alexa Zulu, their avatars interact fluidly, sharing ideas in a mix of voice and on-screen annotations, with language barriers non-existent thanks to real-time translation algorithms.

They talk for a bit, and the learning designer proposes various eleventh-hour adjustments to the upcoming lecture, to address the anticipated difficulties.

Satisfied, Prof Alexa then joins her first lecture of the day, Structural Engineering 201. The virtual classroom is a masterpiece of digital architecture. As her avatar strides into the lecture hall, she is greeted by a diversity of student avatars from around the globe.

Today's lesson is on bridge design, and the classroom transforms into the famous Nelson Mandela Bridge. Students explore the structure, the materials, and the forces at play. Prof Alexa guides them through interactive models that illustrate tension and compression, with parts of the bridge lighting up in response to virtual wind and traffic loads.

After the class, Prof Alexa has virtual office hours. Students come in for one-on-one discussions, each conversation personalised and focused. The AI assistant helps by pulling up relevant coursework and student portfolios, and suggesting customised learning modules based on the student's queries.

For Prof Alexa, lunch is a physical affair, an hour where she disconnects from the virtual world to enjoy a meal with her family. Before leaving her virtual office, though, she consults her AI nutrition guru, an intelligent system that has been tracking her vitals and nutritional intake all day long. The AI recommends a heart-healthy menu taking into account her high blood pressure, and the physical exertion from the morning workout.

Post-lunch, Prof Alexa returns to her virtual office to prepare for an afternoon lab session. Today's focus is on sustainable energy solutions. She sets up simulations of various energy systems, such as solar and wind farms, that students will run later. She adjusts some parameters to enable the students to see real-time effects on efficiency and output. Based on the guidance Doc Sarah gave her when they designed the course last year, she challenges her students with unexpected scenarios like a sudden storm, and a technical failure.

Late in the afternoon, Professor Alexa convenes with a fellow researcher to review the advancements in their joint cross-disciplinary project. Although her research AI assistant has analysed the data, she has several queries regarding its interpretation that she wishes to deliberate with her colleague. Following their discussion, Professor Alexa dedicates herself to meticulously documenting their findings for submission to a reputable academic journal.

Finally, Prof Alexa leaves the virtual workspace to spend the evening with her family. She relaxes knowing that the day has been spent igniting the minds of future engineers, preparing them for challenges both virtual and very real, in a world where the boundaries of education are constantly expanding.

As we peered into the daily endeavours of an academic at a virtual university somewhere in the future, the forward momentum is palpable. Yet, casting a glance over our shoulders, the historical pace of educational progress reveals a journey marked by a sluggish embrace of technology and a noticeable lack of enthusiasm for change, leading to only occasional pockets of success.

In contrast, the advancement in other industries over the past century is strikingly evident. Imagine a surgeon from a century ago time-travelling into the operating theatre of a modern

hospital today. They'd find themselves in an alien world, surrounded by equipment and procedures that would be utterly unrecognisable for the most part. The advancement in medical technology over the past hundred years would be overwhelming to them, symbolising a sea of change in their discipline over the past 100 years.

However, if we turn our gaze to Education, we will note that here, we swapped the blackboard for a green one, later a white one, and introduced projectors. Yet the core nature of teaching and classrooms remained much the same for many years.

Over the past three decades, I've had the privilege to witness and participate in some of the more substantial shifts in education and I would like to invite you to join me on a journey through some personal milestones relating to educational technology.

In the 1980s, my father was a passionate writer of short stories and newspaper articles in his spare time. One of his computer sciences colleagues at work persuaded him to get a personal computer to aid his writing. Inspired, he envisioned a seamless transfer of thoughts to the page by means of this advanced new technology. However, the reality of mastering a personal computer in those days was a complex affair. After a couple of frustrating days of trying, it was my mom, Alida, who eventually had to demystify the new computer, while my father returned to draft his stories by hand, his words later digitised by my mom's diligent typing.

Computing truly wasn't a straightforward task in those days. Starting the computer involved a ritual of inserting a floppy disk containing the operating system's initial segment, followed by a sequence of disks just to get to the point where you could begin using WordPerfect. Back then, the concept of 'WYSIWYG', what you see is what you get, was not a concept we were familiar with. Instead, we navigated a maze of coding-like commands for formatting and printing – a far cry from today's intuitive user interfaces.

Despite the complexities, the wonder of having a personal computer in our own home was unmatched. And I admit, I became quite the Tetris queen during my university holidays!

I started my career full of optimism as a teacher in a local high school, only to quickly discover that it wasn't the right fit for me. I then took a year off to travel the world and broaden my horizons, and upon my return joined Vista University as an Academic Development Officer. It was there that I attended a lecture by the esteemed Prof Johannes Cronjé, which inspired me to pursue a Master's in Computer-integrated Education, rather than the MBA that I had my sights on at the time.

I enrolled in 1997, and by then, my experience with computers was pretty much rusted and outdated. In our Master's class, I stood out – not for proficiency, but for the stark lack of it. Everyone else seemed to have their own PCs at home, and here I was, barely recalling the basics. My ignorance was highlighted when we were asked to download an HTML editor to use in an assignment. After downloading it, I tried opening it through WordPerfect because that was the only way I knew how to open any file. It didn't work, of course... It was in that programme that I learned the value of communities of practice and peer support. Without the chance to learn by observing my fellow students, I'm not sure where I would have ended up. Yet, those studies ignited something unstoppable within me. I was hooked.

Then, as if by magic, the Internet burst onto the scene. Overwhelmed with curiosity, I persuaded a colleague, Paul Beneke, to join me in the university library to dive into this new world. Our first encounter was less than impressive; we attempted to visit the Mercedes and BMW websites, but they were sluggish and almost non-functional. The disappointment was an understatement.

But technology rapidly evolved, and soon enough, desktops with modems became household staples. The iconic sound of the modem connecting us to the internet still echoes in my memory, as does the urgency of being online when every minute was a costly commodity.

The affordance of synchronicity that the Internet made possible was a revelation. Around that time, I took an online short course under the guidance of an Australian professor and found myself in real-time conversations with other academics scattered across the globe. The world suddenly felt incredibly small.

Mobile technology was the next frontier. Despite initially questioning the need to be reachable around the clock, I, too, was captivated by the new gadgets flooding the market. I got myself my very first mobile phone, a Nokia.

Then, in the early 2000s, a line from the movie 'Maid in Manhattan' caught my attention. Jennifer Lopez's character told her son to 'google' something for homework. The way she turned a brand name into a verb intrigued me. The language of new technologies was even changing our vernacular.

Social media erupted onto the scene soon after, with Facebook and MySpace vying for dominance and soon Internet speeds soared, our connectivity became wireless, mobile devices grew more robust, cameras and other functionalities got integrated, and before long, technology became a ubiquitous part of everyday life.

Yet, nothing could quite brace me for the paradigm shift heralded by ChatGPT - the poster child of Artificial Intelligence – at the tail end of 2022, and for me, its personal impact in early 2023. It captivated the world overnight, and within weeks, hundreds of AI innovations were sharing the limelight. And now, just more than a year later, the rapid and exponential advancement of AI is astonishing, and admittedly, somewhat daunting.

The rise of technology catalysed a demand for learning experiences supported by digital means, and in doing so, paved the way for Instructional Design to become a pivotal career path—one I chose to embark upon when I joined Technicon Pretoria around the turn of the century. In those halls, I witnessed a sense of excitement among lecturers to incorporate technology into their teaching and learning practices, which was then regarded as a novel addition to our teaching toolkit. This keen interest compelled our team of instructional designers to develop professional development programs designed to enhance the digital skills of academics and deepen their understanding of the theoretical underpinnings of educational technologies.

In response, we therefore rolled out numerous three-day in-person workshops within the university's computer labs, hoping to ignite a technological revolution in teaching methodologies. However, my empirical research soon revealed a sobering truth—the return on our investment was minimal. The academics relished our hospitality and the break from their daily routines, and some even left the workshops feeling inspired by the technological possibilities we showcased. Yet, once back in their daily grind, the momentum waned. The time to practice their new skills proved elusive, and the multitude of tools and resources we introduced faded from their memory before it could be introduced.

It became apparent that the professional development interventions, which were coined 'button-pushing clinics' and 'where-to-click' workshops by one of the well-respected colleagues in our field (Dr Fran Greyling), were insufficient for the transformative change we envisaged. As an Instructional Designer, I recognised that if we were to genuinely influence our lecturers' approach, a vastly different investment was required—one that would reshape behaviour and practice in a lasting, meaningful way.

While attending a workshop focused on research funding, the conversation turned to the topic of research sabbaticals. These were periods during which academics were granted six months away from teaching, to concentrate solely on their research endeavours. Over the years the practice of sabbaticals proved to be tremendously successful, often the catalyst for lecturers to complete their own postgraduate studies or conduct essential fieldwork.

It was then that an idea struck me: if sabbaticals could be so effective for research, why not apply a similar concept to aid lecturers eager to weave technology into their teaching? This was the inception of Partners@Work – a structured six-month teaching sabbatical designed to achieve specific goals and outcomes. Unlike traditional research sabbaticals, this program was meticulously planned, with each participant provided a clear agenda and end goals to be met by the conclusion of their time away from the usual campus environment.

This initiative provided multiple learning opportunities and just-in-time support from a dedicated Instructional Designer. More so, it fostered a rich community of like-minded academics from various disciplines, all committed to the integration of technology into their curriculum. This community became a wellspring of inspiration, a platform for sharing both triumphs and challenges, and a support network unlike any other. Through Partners@Work, we aimed to not just enhance individual teaching practices but also cultivate a collective drive towards a technologically empowered educational landscape. Following each Partners@Work sabbatical, we not only celebrated the creation and implementation of their tech-enhanced academic modules but also the personal development and technical proficiency gained by the participating lecturers.

Continuing from the innovation of the Partners@Work program, my career progressed to the role of Director of Curriculum Development at Tshwane University of Technology, an amalgamation of three previously separate Technikons. In the wake of the publication of the Higher Education Qualifications Framework (HEQF) in 2007, I was tasked with overseeing an extensive curriculum transformation in the University. Describing the impact of this change as a tsunami, is no exaggeration. With the reconfiguration of the BTech degree and its place in the new framework uncertain, a substantial amount of curriculum work was required.

During this period, I came to understand the intricate complexities of higher education. Many lecturers, steeped and well-respected in their specialised fields, had little or no experience in curriculum or even module design. It was clear that the three-day workshop model of professional development was wholly inadequate.

We addressed this by allocating Curriculum Development Practitioners to each of the faculties with the mandate to provide ongoing advice, guidance, and leadership to academics embarking on redesigning their curriculum to align with the HEQF, which later became the HEQSF that we know today.

Moving away from sporadic workshops, we implemented multiple shorter, focused and just-in-time sessions, breaking down the processes and presenting information incrementally. We also fostered communities of practice within faculties to provide the necessary social support. Back in the office, hours were dedicated to crafting discipline-specific examples, as we observed that lecturers often encountered a mental block when presented with exemplary materials outside their expertise.

This experience underscored the stark reality that lecturers are often recruited for their expertise in a particular subject, or their professional experience and research accomplishments. Important as these factors are, they do not inherently equip an academic

to inspire and educate effectively, with or without technology. The need for skilled instructional and curriculum designers became increasingly evident.

Over time, however, the term 'instructional' designer came under scrutiny, linked as it was to behaviourism and operant conditioning which seemed at odds with the current move towards constructivist approaches in education. The field adapted, and 'Learning Designers' became the preferred title for professionals integrating contemporary pedagogic principles and educational technology. Yet, the nomenclature in this field remains diverse, reflecting various focus areas and the specific needs of the environment in which these specialists operate.

Some of these titles include educational technologists, who harness technology to facilitate learning; eLearning specialists, who design online learning experiences; learning consultants, who provide expert advice on educational strategy; and others like digital learning coordinators, academic technology officers, or courseware developers. Each of these roles plays a distinct part in the multifaceted tapestry of educational innovation and progress.

The recognition of learning design as a profession has grown tremendously over time, not just in higher education, but also within sectors like banking and mining, which increasingly seek out experts to enhance their training and development initiatives. Consequently, the demand for skilled Learning Designers has surged, inflating their market value, and creating intense competition for their expertise. With private sector salaries soaring, universities often struggle to compete, making Learning Designers among the most sought-after professionals in academia.

In my current position as Director of Comprehensive Online Education Services (COES for short) at the University of Pretoria, my role involves leading the transformation of high-demand academic programmes to fully online. The COES team follows in the footsteps of the Partners@Work programme of earlier years and ensures that all the professional development elements required for real change are addressed, including the freeing up of time, the offering of dedicated and on-demand support, implementing a structured development programme and fostering supportive communities of practice.

Despite technological advancements becoming more deeply integrated into daily life, some educators however continued to resist incorporating educational technologies into their teaching. This resistance may have stemmed from an inability to see the relevance and value added by the incorporation of the technology, or simply from being intimidated by the learning curve. The phrase "It will never work in my module/discipline" became a familiar refrain among reluctant staff, many of whom feared being outperformed by their more tech-savvy students, risking the loss of authority and respect in the classroom.

This sentiment continued to echo strongly up until as recently as 2019, when an information technology (IT) lecturer summarily dismissed the idea of online learning in her classroom, insisting that complex concepts that she needed to teach could not possibly be adequately conveyed without face-to-face interaction.

Then, COVID-19 struck, and the entire world came to a standstill. Higher Education institutions were forced to pivot to online learning to continue their operations. The University of Pretoria, having invested in a robust LMS and a hybrid learning environment for over a decade, was better prepared than most. The emergency transition to remote learning was still a struggle, but the foundations laid in earlier years facilitated a relatively smooth conversion.

In the early days of the lockdown, many lecturers attempted to replicate the physical classroom in the virtual space, only to encounter the realities of infrastructural and socio-economic disparities. In response, the University provided laptops and data to disadvantaged students, but soon, lecturers began to explore the variety of tools available within the Learning Management System.

Interestingly enough though, when after the two years of the pandemic, faculty members were asked to return to campus for their in-person classes, many seemed to be reluctant having seen a marked improvement in class attendance measured by the number of views the online lectures that were delivered in concise, segmented videos got. Many of those who once vehemently opposed technology integration were now eager to explore and learn more about how technology could be used to overcome their teaching or learning challenges. So, despite the devastation brought about by the pandemic, it also had an unexpectedly positive impact on the field of learning design, accelerating the acceptance and integration of educational technology.

Then, just months after this adaptation, Artificial Intelligence (AI) disrupted the landscape yet again. AI's entry into education generated much excitement but also raised concerns, particularly about its implications for academic integrity and assessment practices. We soon realised that AI technologies can analyse, synthesise, evaluate, and create at a pace and level of sophistication beyond human capability. The educational staples of essay writing, critical analysis, and problem-solving seemed at risk of obsolescence in the face of AI's vast capabilities.

And with its emergence, AI revolutionised the lives of Learning Designers all over the world. With AI, curriculum design processes that used to take months can now be done in a fraction of the time. The meticulous development of assessment materials and the accompanying formative feedback can also be accomplished with astonishing speed, including the creation of time-intensive tools like rubrics.

Students, meanwhile, also explored the capabilities of AI, and can now produce well-written assignments in minutes, without the need to engage meaningfully with the content. The usual strategies to detect and deter plagiarism are not yet effective enough to combat these unethical practices. The benefit of efficiency, therefore, comes at an obvious cost—the potential loss of deep learning experiences. We find ourselves in a time where traditional assessments and teaching methods are being challenged as never before.

The instinctive move might be to revert to proctored, in-person handwritten exams to guarantee student authenticity. However, this approach can lead to an unwelcoming and unrealistic learning environment, given that AI will be universally accessible in future workplaces. Our graduates will inevitably work alongside a variety of AI tools. If we don't incorporate these technologies into their education, guiding them in their ethical and responsible use, we risk leaving our students ill-equipped for what lies ahead.

We must chart a course that navigates the complexities of an AI-integrated academic landscape with care and foresight. This begins with the crafting of robust policies that serve as guardrails against the misuse of AI, safeguarding academic integrity and ethical standards. Alongside setting these boundaries, it's just as important for Learning Designers to outline clear and actionable guidelines that empower students and educators to harness AI's potential responsibly and productively.

Yet, our responsibilities extend beyond the drafting of rules and the shaping of conduct. We must also embark on a reflective journey to reassess the core mission of our universities. A profound and critical examination of the very nature of teaching and learning in an AI-driven era is required. Such reflection requires us to question and redefine what it means to

educate and be educated, ensuring our institutions remain relevant and our students well-prepared for a future where AI is not just a distant tool but a constant, accessible companion in their professional lives.

In conclusion, AI's impact on higher education—and humanity—is profound. We must not disregard the threats it poses, nor should we discard the technology altogether. In this era of exponential change, where AI reshapes the boundaries of what is possible, the role of Learning Designers becomes even more crucial than before. They are the visionaries and architects who will navigate this transformative landscape, guiding the evolution of educational methodologies, and they stand as the pivotal force in reimagining the future. They will craft new paradigms where technology enhances rather than replaces the human intellect, fostering environments that cultivate critical thinking, creativity, and adaptability, and will be tasked to preserve the essence of what it means to be human in a world interwoven with AI.

I thank you.
Geolé!