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The outlook of final-year students in information science on the world of work

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Background: The principle of co-creation in curriculum design has become fundamental in recent times, necessitating the multiplicity of relevant voices to speak into curriculum design. These voices include those of the student, academics, professional and industry partners.

Objectives: This research presents the perspectives of final-year undergraduate students on the world of work and the relevance of their academic preparation related to their imagined future.

Method: Secondary data from a practical assessment using SenseMaker®, a distributed digital ethnographic methodology, were used, which collected micro-narratives from the students. Students self-analysed their narratives into a pre-designed quantitative framework. Further secondary data extracts were collected from an assessment in which students reflected on their skills gained, skills required and skills gap aligned to the potential careers that they can pursue with a qualification in information science.

Results: The results show a strong techno-centric view among students, a significant cluster that feels anxious about their immediate future and the future of work, and a potential understatement of wellbeing.

Conclusion: This study shows the potential of using SenseMaker® to support distributed ethnography as an approach to bring the multiplicity of voices into curriculum design, as well as a rich narrative repository for professionals and industry who will be leading these new professionals as they enter the workplace.

Contribution: Soon-to-be graduates, employers and educational institutions gain insight into the relevance of the already developed curriculum, the experiences and skills development of students, their aspirations towards future expectations and their disposition towards their current and imagined realities.

Keywords: co-created curriculum; critical pedagogy; knowledge management; information science; episodic foresight; SenseMaker®.

Introduction

Whole-class co-creation, as described by Bovill (2020:1023), implies an inherently inclusive approach to the methods of teaching, such as face-to-face, blended, online, lectures and practical in all their forms, as well as the development of the curriculum and content in higher education. Whole-class co-creation is often seen as an approach to teaching and learning that contrasts with partnerships described in international literature, where a small group of super-engaged and privileged students are selected to co-create teaching and learning (Bovill 2020:1023). Bovill and Woolmer (2018:5) also distinguished the timing of co-creation, namely co-creation *of* the curriculum, which takes place before the programme is offered, and the co-creation *in* the curriculum, which takes place during the programme.

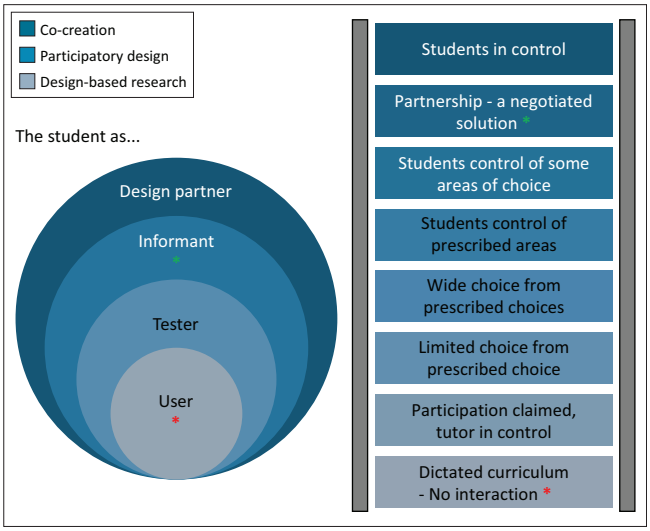
Bovill et al. (2016) identified four roles adopted by students in co-creation work, namely representative, consultant, co-researcher and pedagogical co-designer. Acknowledging overlaps in the roles, Bovill et al. (2016) and Bovill (2020:1025) describe these roles as student representative, being an elected role in which a small group of students represent a larger group of students. The consultant or intern roles represented students selected by staff and often paid to collaborate on projects. Co-researchers and pedagogical co-designers could be small groups or whole-class groups selected by the staff. Druin (2002:4) described the roles of children in terms of technology design as user, tester, informant and design partner.

Note: The manuscript is a contribution to the collection titled 'Embedding Knowledge Management into Business Processes for Operational Excellence', under the expert guidance of guest editors Prof. Martie Alet Mearns, Prof. Vincent Ribière and Prof. Rexwhite Enakrire.

Martens et al. (2019) presented a graphical representation as shown in Figure 1, varying the levels of agency that students have, based on the ladder of student participation developed by Bovill and Bulley (2011), within the various approaches to student participation in the design of learning and teaching (design-based research, participatory design and co-creation), matched against the student's role as design partner, informant, tester and user as identified by Druin (2002:4).

Each of the red asterisks in Figure 1 depicts the role and level of participation that students were initially regarded in during curriculum development. The green asterisks depict the ideal, but also the realistic potential, towards which this research intends to strive in bringing the student into a co-creation role and partnership.

With co-creation seen at the higher levels of agency for the student partner, Bergmark and Westman (2016:29) regard the process of co-creating curriculum as a way in which democratic values can be promoted in higher education. With this greater openness towards diverse perspectives, lecturers are challenged to move from the well-known (their views), to the unknown and different (others' views) (Bergmark & Westman 2016:29). By allowing students greater agency, an appreciation for plurality and the multiplicity of perspectives acknowledges the relevance of the students' voices to speak into the curriculum towards the development of their intended future. Without a doubt, this challenges the traditional roles of students and lecturers (Cook-Sather 2014); however, Bovill (2014:22) disregards the notion that co-creation diminishes the lecturer's expertise, and there is an emphasis on democratic values and a multidimensional learning view in the social relationship and hierarchy in the classroom (Bergmark & Westman 2016:30).



Source: Adapted from Martens, S.E., Meeuwissen, S.N.E., Dolmans, H.J.M., Bovill, C. & Könings, K.D., 2019, 'Student participation in the design of learning and teaching: Disentangling the terminology and approaches', *Medical Teacher* 41(10), 1203–1205. https://doi.org/10.1080/0142159X.2019.1615610

FIGURE 1: Links between student-staff collaboration approaches, roles and student participation.

Smith and Seal (2021) highlight the principles of critical pedagogy as education being inherently political, that knowledge should relate to and develop from the lived experience of participants and that knowledge should be co-created between all participants in the learning process. Critical pedagogy aims to develop critical thinkers who create new knowledge, which is an aim of specific interest to this research, as discussed in more detail below. Further aims for critical pedagogy are for people to become aware of their own and others' oppressions and develop the will to act, and for people to make connections between personal experiences and wider societal forces (Smith & Seal 2021). Smith and Seal (2021) further highlight approaches in critical pedagogy as emphasising the importance of democracy and equality in learning environments, underlining a co-created flexible curriculum using authentic materials, generative themes and teachable moments, as such, cultivating hope and symbolic resistance.

This study was developed from the perspective of whole-class co-creation, acknowledging students as partners with high levels of agency, imagining a future that they are about to enter as soon-to-be graduates. The main research question developed for this study is: Considering the potential influence of students' ever-changing anthro-complex worlds, how can curriculum co-creation be used to design and deliver meta-literate learners in Information Science from undergraduate to postgraduate students, including their preparation for the world of work? The research objectives of this study were the following:

- Capture students' individual experiences of their undergraduate study journey in relation to their imagined future career prospects through analysing reflective assignments.
- Gain insight into how equipped students regard themselves to face the threats and opportunities of their imagined future.
- Include the voices of students in the transformation of appropriate curriculum content development and teaching practices design and delivery, to prepare them for the careers to which they aspire.

To achieve any of these objectives, it was necessary to view the current perspectives of knowledge management (KM) and information science as interrelated disciplines, as the curriculum context in which the study was conducted.

Perspective on knowledge management and information science disciplines

Knowledge management has developed into an independent academic field (Ribière & Calabrese 2016:13), with a high degree of interaction with other disciplines, with library and information science playing a core role in the development of KM (Liebowitz & Paliszkiewicz 2019:16). True to the nature of knowledge managers, thought leaders in the KM field have lately been reflecting on the past and future of KM (Dixon 2018; Liebowitz & Paliszkiewicz 2019; Ribière & Calabrese 2016; Russell, La Londe & Walters 2016).

Liebowitz and Paliszkiewicz (2019) recognised four generations through which KM has evolved, the first being personal KM to improve the individual's ability to best capture, share, apply and leverage knowledge. The second generation involved the collection and codification of knowledge to move from the individual focus to organisational effectiveness. In the third generation, knowledge collaboration and social networking became the focus towards innovation and transdisciplinary knowledge generation, as a means to break down discipline and functional silos. Liebowitz and Paliszkiewicz (2019) identified the current and fourth generation as one in which artificial intelligence (AI), machine learning, data analytics, the Internet of Things (IoT) and emerging technologies take the forefront in KM.

Dixon (2018) presented and wrote extensively on the three eras of KM, and more recently ushered in the fourth era of KM. The eras start around 1995 with leveraging explicit knowledge, followed in 2000 with leveraging experiential knowledge, in 2010 with leveraging collective knowledge and in 2020 with leveraging the creation of knowledge with specific reference to the need for sensemaking in what has become an agile and increasingly complex world of work. Knowledge management curriculum and higher education institutions often form part of the formal curriculum in disciplines such as information science, focused on delivering graduates trained to be information intermediaries and managers, skilled in using technology to retrieve, organise, add value to, package, disseminate and manage information and knowledge as two of the most important resources that enterprises have. In KM and information science curricula, the focus is often on people and user behaviour with students selecting second majors and elective modules from humanities and business management faculties.

In alignment with the thinking of Suddendorf and Corballis (2007) and Miloyan and Suddendorf (2015) about episodic foresight, students were asked to reflect on what lies in their future. Episodic foresight is a form of mental time travel in which the mental construction of future scenarios and the organisation of current actions considering such constructions allow humans to plan and prepare, take advantage of opportunities and manage risks (Miloyan & Suddendorf 2015:196).

Research methods and design

Multiple purposes drive the assignment in episodic foresight in the course, namely, to allow students the opportunity to act as co-creators in the curriculum design, to gain experience with a sensemaking tool as part of their practical in a KM module and to reflect on their course material in preparation for their future job-hunting endeavours as soon-to-be graduates. As part of their KM practical curriculum, they work with SenseMaker® to learn how to use the technology as a distributed ethnographic tool to facilitate and demonstrate sensemaking and storytelling as a KM process. Through this assessment, 153 micro-narratives or anecdotal entries formed part of the secondary data used in this portion of the research. Several prompts were used in this study to stimulate the episodic foresight and are discussed and contextualised in the Students' imagined career prospects discussion.

With the collection of these micro-narratives, the student, as a participant in imagining their future, proceeds to self-interpret and self-analyse their micro-narrative. The interpretation and analysis are therefore not done by the researchers but by the respondent in recognising epistemic justice and disintermediation. While SenseMaker® allows for quantitative patterns to emerge that are explained or described by the micro-narratives, the interpretation of the quantitative patterns remains a qualitative descriptive process. The interpretation of narratives is not done by the researcher(s) but by the contributor of the micro-narrative. The concept of epistemic justice is relevant in the way SenseMaker® allows for naturalised sensemaking that is culturally, experientially, geographically and temporally diverse and removes the interpretation of the researcher, reducing researcher bias. Signification is done using triads and dyads. In a triad, respondents are asked to add meaning to their stories and narratives by evaluating the relative influence and significance of three interacting and interrelated factors within a triangle. For example, assessments reflected whether their narrative created feelings of fight, flight or freeze and a marker was placed to signify the extent to which these three feelings are relevant based on the micro-narrative that was shared. Dyads place points of tension within a single scale or straight line to add another dimension to test for the intensity of the influence of different factors. For example, 'as future professionals in the workplace, what we need to focus on will be (1) addressing the past or (2) building the future'. Markers are then also placed along this line of possible tension between points depicted in this example between (1) and (2), reflecting the self-signified point that the participant gravitates towards.

Self-analysis and signification by participants ensure that testimonial injustice is avoided, and the information provided by the participant gets the value it deserves from the voice of the participant and not from the perspective of the hearer only. Hermeneutical injustice is also avoided because the respondent is self-involved in producing social meanings within their own social identity, avoiding marginalisation because of their social identity. This method also allows for two-stage emergence, a key aspect of naturalised sensemaking. Concepts are broken down and assembled differently, with the process being repeated. As a result, entrained thinking can be broken, new patterns can be detected, and new perspectives can be gained.

The findings discussed in this research are derived from secondary data that student assessments deliver to assist lecturers in making sense of the students' lived experiences in their learning journey to reflect as lecturers on teaching and learning practices, redesigning teaching practices, transforming curriculum and choosing appropriate

content as insights are gained into how students perceive their learning. The findings for the students' future career prospects are derived from assessments conducted in 2023 by two cohorts of students, one totalling 136 assessments and the other totalling 153 assessments.

The ethics clearance pertinently to this study includes the analysis of secondary data. The original purpose of collecting the assessment data is to evaluate student performance in a module. The proposed research used for curriculum analysis and research design is still compatible with the original use. Section 15 of the *Protection of Personal Information Act* (*POPIA 2013*) makes allowance for further processing of data where the secondary purpose is compatible with the original intent. Curriculum design is intrinsically linked to assessment practices, and reflecting on assessment outcomes supports continuous educational improvement. Justification for educational value is made in identifying curriculum gaps and misalignment between learning outcomes and assessment strategies, thereby informing pedagogical improvements serving the public interest (Section 27 of *POPIA*), and aligning with institutional goals. In accordance with Sections 10 and 19 of *POPIA*, data minimisation and anonymisation were applied and only the minimum necessary data will be used from assessments. No identifiers were collected in any of the data, and therefore, misuse is not possible.

Ethical considerations

Ethical clearance to conduct this study was obtained from the University of Pretoria Faculty of Engineering, Built Environment and Information Technology (No. EBIT/52/2025).

Results

The secondary data selected for this article offer a view on the future career prospects of students as seen from their perspective in terms of the skills they have acquired and the skills that their future career might demand from them. To understand the ever-changing anthro-complex world of the students, it was necessary to gain insights into their individual experiences of their undergraduate study journey and gain a view of the future career prospects they imagine for themselves and how prepared they perceive themselves for such potential careers.

In an assignment created to reflect on the past in terms of the possible future, they developed a realistic view of the skills gaps that they potentially need to bridge. The second set of secondary data selected offers a peek into students' imagined future, a mental time travel to evolve episodic memory and to aid their foresight system. Suddendorf and Corballis (2007) and Miloyan and Suddendorf (2015) see episodic foresight as an evolutionary memory that underpins our predictive foresight, and so it allows students to store pending goals and associated and anticipated environmental features to quickly recognise these opportunities to achieve them as future goals. The findings in the section that follows explore this notion of episodic memory and current states systematically influencing distant prospects.

Students' future career prospects

In a final-year undergraduate assignment, the cohort of students was tasked to reflect on where they are in their qualification journey and where they need to be to enter the world of work in Society 5.0. As soon-to-be graduates in a digital age, they were sensitised to the specific demands on them in becoming valuable employees in a potentially challenging world of work that could reach beyond the boundaries of the country in which they are studying and require a global perspective. They were directed to look at the possible jobs on the Skills Framework for the Information Age (SFIA), at present in its ninth release and select the jobs that they might be able to apply for with the qualification that they have studied in their undergraduate degree. They were therefore able to list more than one possible job they would be interested in.

Skills Framework for the Information Age collaborates globally and developed a skills and competency framework for the digital world, listing the most demanding global occupations in information and communication technology, business change, digital transformation, data science and analytics, software engineering, information and cyber security, learning and education, applied computing and computational science, user-centred design, digital product development, sales and marketing, human resource and workforce management. Using SFIA provides a common language throughout the skills management cycle for the required skills for the digital world, so that organisations can achieve a consistent and integrated skills and people management system. This common language allows organisations to achieve consistency in sourcing and deployment, specifically relating to the levels of responsibility and skills (SFIA 2025). From an educator's perspective, exposing soon-to-be graduates to using SFIA to imagine the future they want puts them in a position to reflect on the skills they have developed against the skills indicated in SFIA as needed for each competency, and therefore, they are in a position to fill the gaps in the skills they discover they still need to gain. Skills Framework for the Information Age also assists training institutions to assess their curriculum validity against a globally sourced information resource and plan and develop content and activities to build capacity (SFIA 2025).

The assessment revealed an expected focus on selected jobs. The cohort of 136 students selected 541 entries for 94 different jobs in which they are potentially interested. Figure 2 indicates the SFIA categories in which these jobs fall, with frequencies indicated for each category.

These categories are divided into several sub-categories, and the intent of these categories and sub-categories is stated by SFIA (2025) to be useful for role profiling or creating job

descriptions in building an organisation's competency framework. While the categories and sub-categories in SFIA do not have specific definitions themselves, SFIA (2025) reports that many users find these categories useful and maintain that SFIA is a flexible resource and skills can easily be grouped and filtered into alternative views to support specific industry disciplines, particular environments and frameworks. Figure 3 indicates the top 24 jobs, each mentioned more than seven times from the total number of 541 entries, that students are likely to choose to pursue.

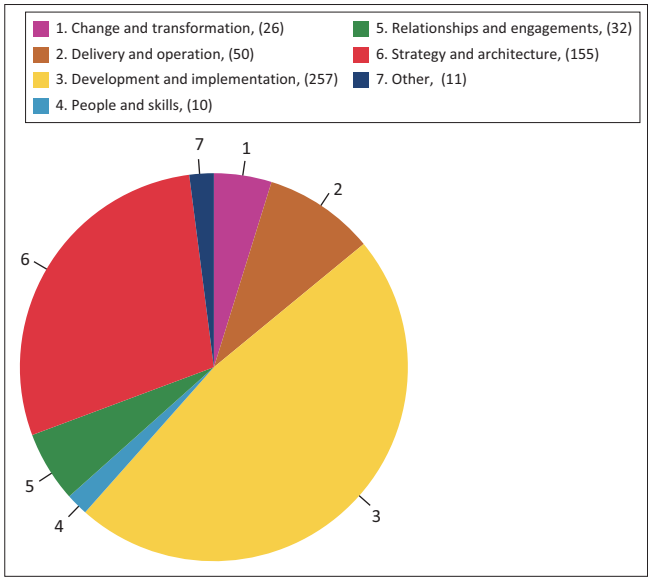


FIGURE 2: Selected jobs related to skills framework for the information age categories (N = 541).

Admittedly, the selected jobs could comprise skills taken from multiple categories and sub-categories (SFIA 2025); therefore, for the sake of this research being based on this framework, the data are presented within the indicated categories according to the SFIA9 summary chart (SFIA 2025). The findings align with the focus of the academic department, with information management selected 50 times, KM selected 27 times, and collectively, all the data analytics jobs combined were selected 140 times. In the SFIA framework, data analytics jobs include data management (25), business intelligence (30), database administration (20), data science (18), data engineering (13), data analytics (11) and data modelling and design (7). The two sub-categories that fall under the broader category of development and implementation that received multiple entries as potential careers to pursue are the systems development sub-category, which includes infrastructure design (12), programming and software development (11) and network design (8); and user-centred design, which includes user experience design (7) and user experience analysis (7).

After having gained insight into the potential career choices students have and which they believe their qualification prepared them for, it was necessary to gauge their attitudinal position and sense of identity in this ever-changing anthro-complex world. Of specific interest was to learn how they perceive themselves within a volatile, uncertain, complex and ambiguous world. The next section therefore sheds light on how students see themselves take on opportunities, what they regard as threats and how equipped

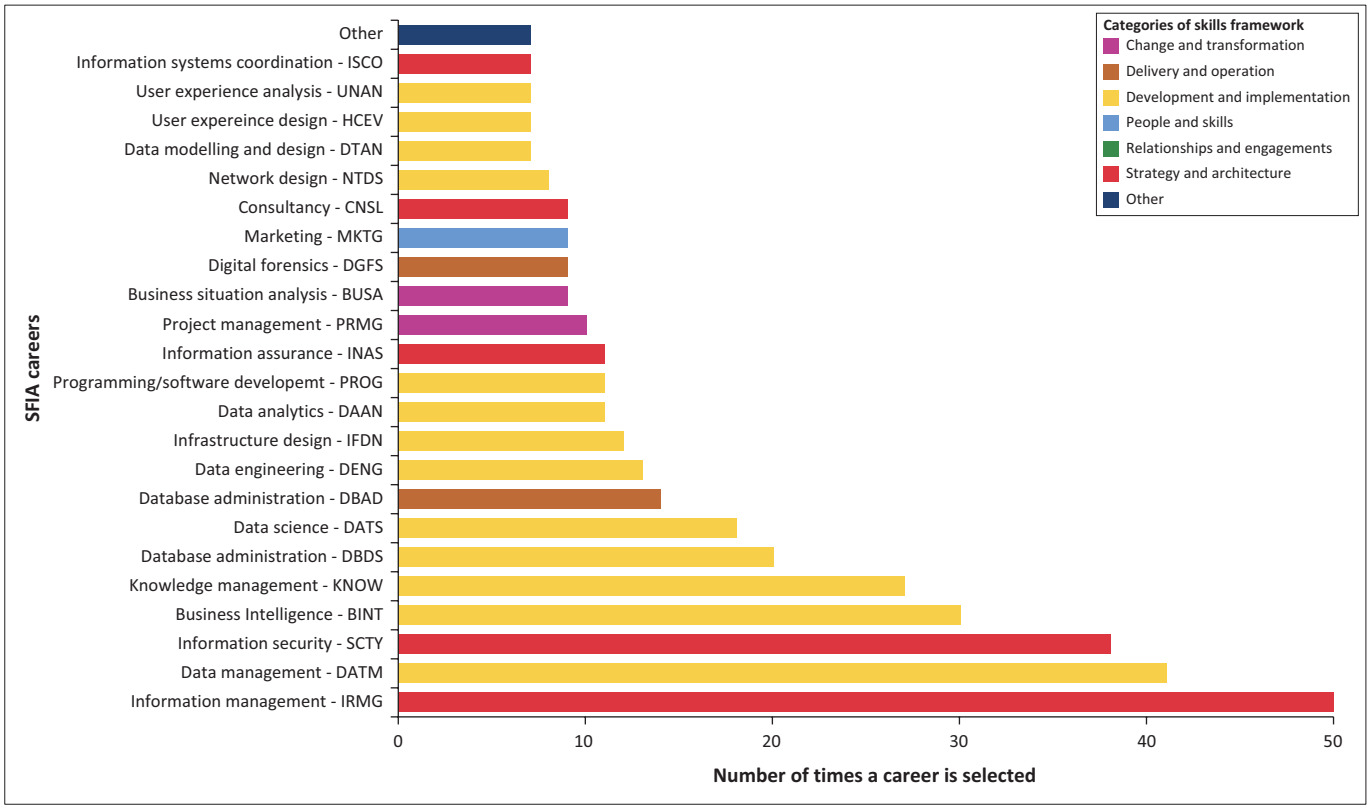


FIGURE 3: Top 24 jobs mentioned at least 7 times or more (N = 541).

they consider themselves in proactively addressing such threats or opportunities.

Students' imagined career prospects

This section focuses on the information extracted from the secondary data based on the SenseMaker® assignment. The inquiry began with a narrative prompt to gain insight into what the students regarded as topical for their future as information professionals:

> *Prompt 1: If you think about what lies on the horizon, what comes to mind. What will be the biggest opportunity or threat facing us in the future that we as information science, knowledge management and IT professionals need to consider? Please, in a few sentences, share an experience or something you've come across that shaped your thoughts? (Please do not include the real names of people or institutions in your story.)*
>
> *Prompt 2: Please write a news headline for this story.*

In the second part of the inquiry, students had the opportunity to share prospective stories, insights into what they see, what they imagine and the dream they have for their future:

> *Prompt 3: Imagine you are invited to a prestigious forum where you will be the voice of your generation and those that follow. In this role, what key changes and initiatives would you champion to proactively address the threats and opportunities on the horizon?*
>
> *Prompt 4: Taking into account the insights your entry provides about the future ahead, what is the one actionable step you feel inspired to take right now to shape a more promising future for both yourself and the generations to come?*

As indicated in the research methods and design discussion of this paper, self-analysis and signification by participants happen from the perspective of the students as an informant (Figure 1), an active voice speaking into the curriculum and as a potential co-creator. As a process geared towards the student-as-an-informant, the SenseMaker® journal serves as feedback and input for lecturers. This is two-fold, firstly to assess the students' expression against the curriculum and the intent of lecturers from both the formal and implicit curriculum. Questions such as 'Are there unexpected or unintended patterns and discourse in the perspectives, attitudes and sensibilities of the students?' can be picked up in the analysis in SenseMaker®. This can reveal patterns showing an overly dominant perspective or underrepresentation of relevant and necessary perspectives. Secondly, the narratives behind potential patterns of concern can provide input into the curriculum to shift perspectives and discourse, thereby constituting an indirect participation of the student as co-creator.

Attitudinal disposition

The attitudes expressed does not show a general concern that students feel ill-equipped for their future as information professionals. The sentiment of the majority of students is either neutral (51%) or positive (32%), with 17% of the students reporting a negative sentiment towards their entry. As shown in Figure 4, the neutral and negative feelings are proportionally higher for those who perceived their story to be about a threat and not an opportunity.

The prevalent attitude evident in triad 1 (Figure 5A) is to fight and does not reflect a tendency to freeze or run from the situation. However, those with a negative sentiment expressed a stronger inclination to freeze.

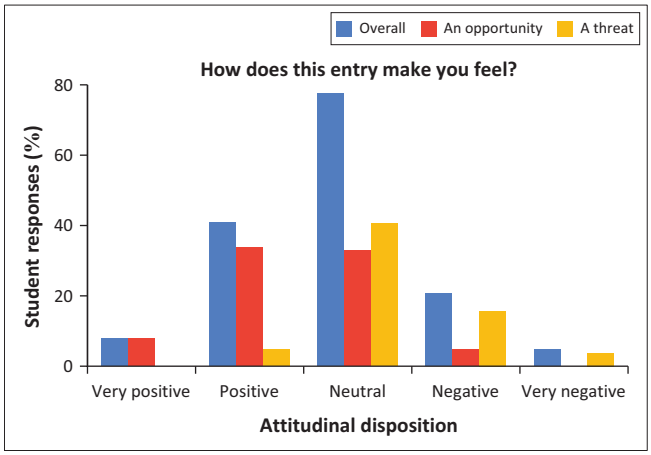


FIGURE 4: Attitudinal disposition towards the future (n = 153).

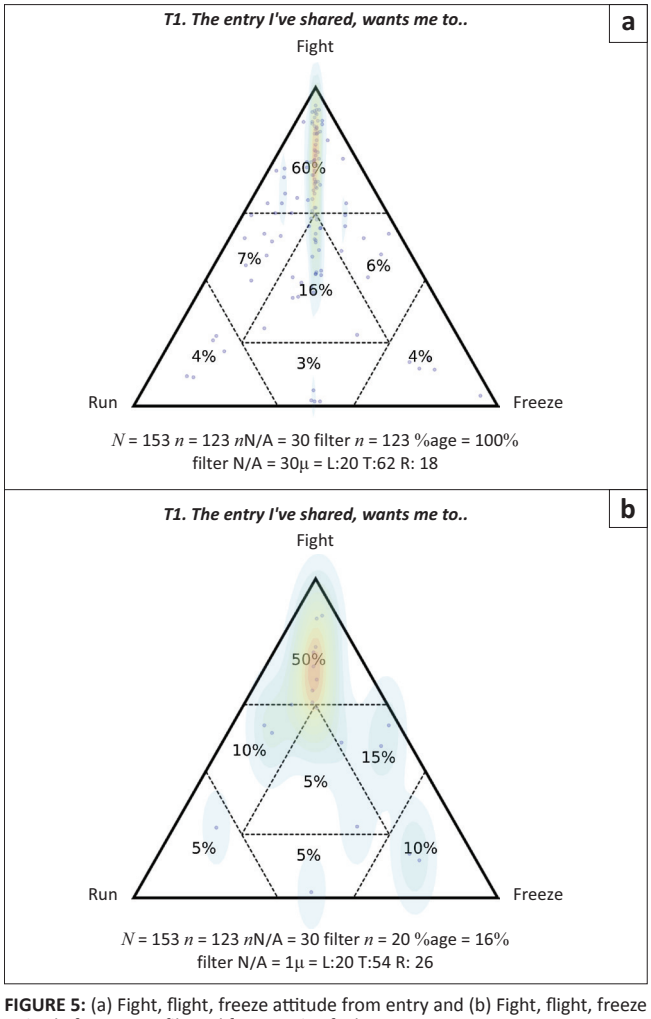


FIGURE 5: (a) Fight, flight, freeze attitude from entry and (b) Fight, flight, freeze attitude from entry filtered for negative feeling.

TABLE 1: Narratives or headline entries explaining freeze, run and fight combination responses.

Freeze	Run	Freeze-Run	Fight -Run	Fight-Freeze
Developing in an IT world	AI takes over the world!	AI Take Over in the IT industry.	The threats of Technology in the near Future.	Future of Information Professionals.
Is an Information Science degree really useful?	Online Friend	Threats and Opportunities for individuals in information management	Unlocking the Power of Data While Battling Cyber Threats	Alexa play replaceable
The digital divide	Knowledge Managers turn into AI Managers	Will AI take over the IT world?	Knowledge Management: Is It Relevant?	The way IT field makes me concerned.
Artificial Intelligence: Curse or Blessing?	What lies on the horizon	Uncertainty of the future	The future is presently in your mind. THE FUTURE!!	Dirty digital links
Degree? Beneficial or not?	-	-	-	IT specialist in collaboration with AI
When I think about what lies on the horizon, my first thought is unemployment.	-	-	-	-
I personally believe there is enough room IT professionals to grow, however, many people are coming into the IT industry which is not a big thing however, it may become oversaturated and there are people who are currently around facing retrenchments. We also have the opportunity to do various certificates to continue educating ourselves about various aspects in the IT industry.	-	-	-	-

IT, information technology; AI, artificial intelligence.

The narratives for the inclination to freeze or run are not exclusive, and similar narratives are also present in the cluster for fight. Table 1 provides an overview of the narratives or their expressed headlines for freeze, run and a few combinations for freeze-run, fight-run and fight-freeze. The narratives present in the freeze cluster suggest that students are not sure what to do, or question their agency to do something about the situation. These narratives are mainly about concerns regarding job prospects. Headlines or narratives reflect a real concern for AI as a threat to graduates' futures. Considering that the secondary data in this paper was from 2023, the novelty of AI penetration and the lack of AI-related research at the time explains the increased level of fight, run, freeze responses associated with AI as a potential threat to their job futures. Future research in repeating this same assessment with subsequent cohorts of students will present valuable insights into patterns emerging about the prospect of AI continuing as a threat or not.

From Figure 6A–6C, students' expectations are mostly influenced by their studies, as well as social media or the mainstream media, or a combination of the two (Figure 6A). The influence of studies is stronger when filtering those narratives through an expressed positive sentiment (Figure 6B). A combination of studies and social media or the mainstream media patterns emerges when the same data are filtered by negative feelings (Figure 6C). This negative sentiment also reveals a slight pattern towards a family and friends influence (Figure 6C), which is absent in the positive filter, and is reassuring that support structures of family and friends become more prevalent when negative feelings prevail.

The attitudinal disposition of the students on the expectations that will be on them as information professionals is further expressed in their responses to a series of dyad questions. In Figure 7A–7E, the mean is represented by the dotted blue line and is regarded as the measure of central tendency that represents the typical value in each of the dyads. In dyad 1 (Figure 7A), the threat or opportunity being either a remote possibility or already having an impact measures at 77 and inclines towards the threat or opportunity already having an impact. Dyad 2 (Figure 7B), with a mean value of 76, reflects a tendency to perceive the impact of the threat or opportunity in the narratives as global. A mean of 44 in dyad 3 (Figure 7C) shows an almost even spread between perceiving the future as a suspenseful thriller or action-packed adventure. The same kind of even perspective, with a mean of 43, is reflected in the response required towards acting carefully or swiftly (Figure 7D) with a slight notion towards acting carefully rather than quickly. In dyad 5 (Figure 7E), a mean of 64 suggests a stronger notion towards perceiving the future as 'incredibly hard to action', instead of a perception that it is 'easier than what it seems'.

In general, the distribution of responses for a dyad is similar for the sentiments of feelings and opportunity or challenge. Students sharing the sentiment that it will be a suspenseful thriller also feel, in general, more negative about their entry. Further triangulated correlations in dyad 4 (Figure 7D) and dyad 5 (Figure 7E) show a shared sentiment that the future as a suspenseful thriller will also be incredibly hard to act out. Included in the narratives are concerns about the ability to keep up to date with the advancements, understanding and responding to how AI is changing the nature of jobs and the potential to displace jobs. In dyad 3 (Figure 7C) and dyad 4 (Figure 7D), there is a correlation between acting carefully and hard to act, and acting quickly and easy to act.

Aboutness

In this section, the analysis includes the signifiers that relate to the aboutness of these future-oriented narratives. For the students, their story is predominantly about technological advancement, with a slight slant that also signifies society and communities as topical.

Those with a positive sentiment towards their entry are even more clustered (88%) towards technological

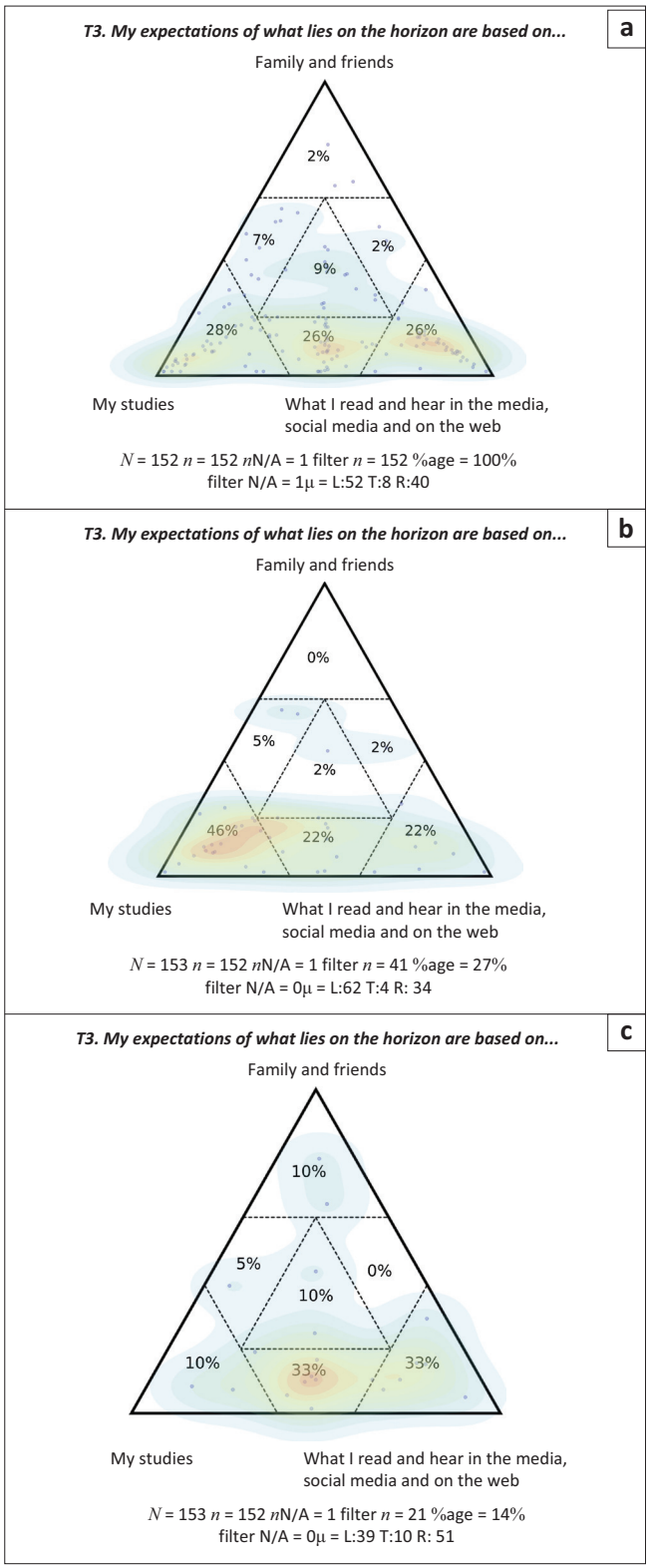


FIGURE 6: (a) Expectations influenced by family and friends, my studies or media and social media, (b) Expectations influenced by family and friends, my studies or media and social media: filtered by feeling positive and (c) Expectations influenced by family and friends, my studies or media and social media: filtered by feeling negative.

advancements (Figure 8A). When filtering the technology-advanced patterns through very positive (Figure 8B) and very negative (Figure 8C) filters, the focus remains on technology advancements, clearly indicating that the same technological advancements leave some narrators with a very positive feeling and some with a very negative one. When extracting the micro-narratives associated with the very positive and very negative sentiment (Table 2), the underlying excitement about the growing need for information professionals with AI skills, and the need to continue their education and learning about these new technologies, clearly stand out.

These patterns are mirrored with a concern in the cluster that shares a negative sentiment, namely that AI will make the jobs they are trained for obsolete. Ethical and other issues concerning AI tend to outweigh the prospects of AI in the narratives. The selected narratives also show that despite the focus on technological advancements, the perspective includes a concern for society in the need to educate society on the ethical and responsible use of these technologies. This is evident in the slight pattern changes that can be seen towards a society and community focus and a government, politics and economy focus, as seen when filtering these narratives with feelings of being very negative (Figure 8C).

In Figure 9, based on the question of who can make a difference to what lies on the horizon, implying shared accountability for the narrators' futures, there is lower acknowledgement of the influence of government and the private sector, and a stronger acknowledgement of communities or collective action. The narrative for the relatively dominant centre includes two themes. Firstly, a concern about the negative impact of AI on job prospects, and secondly, there is a need to be adequately prepared for a technology-driven future and the need for ongoing learning and education.

Narratives that underlie the patterns seen in Figure 9 are:

- *I would put into legislation a maximum number of tasks organisations are allowed to get AI to perform. This will help guarantee that not too many jobs are taken away from people. I would advocate the dangers that AI brings, but also make sure that people bring the great opportunities it can provide.*
- *I would encourage people to expand their knowledge base. To know as much about AI as possible to understand the possible threat it poses. They should also make themselves unable to be dismissed in their jobs by ensuring they have something that AI does not, whether it be creativity, an innovative mind or an emotional connection to the work.*
- *Introduce technology to all fields of study. Skills to use the technology are important. Technology should be a must for all students in high school.*
- *I plan to educate myself on AI so I can understand its capabilities and potential more. I want to be able to utilise it to the best of my ability and further educate more people on what I find out.*

Discussion

The study established that many students took a neutral stance when sharing and thinking about what lies on the horizon for them as information professionals, specifically in the dyads. While this is not necessarily unexpected or undesirable, preparing students to take a less neutral stance will strengthen

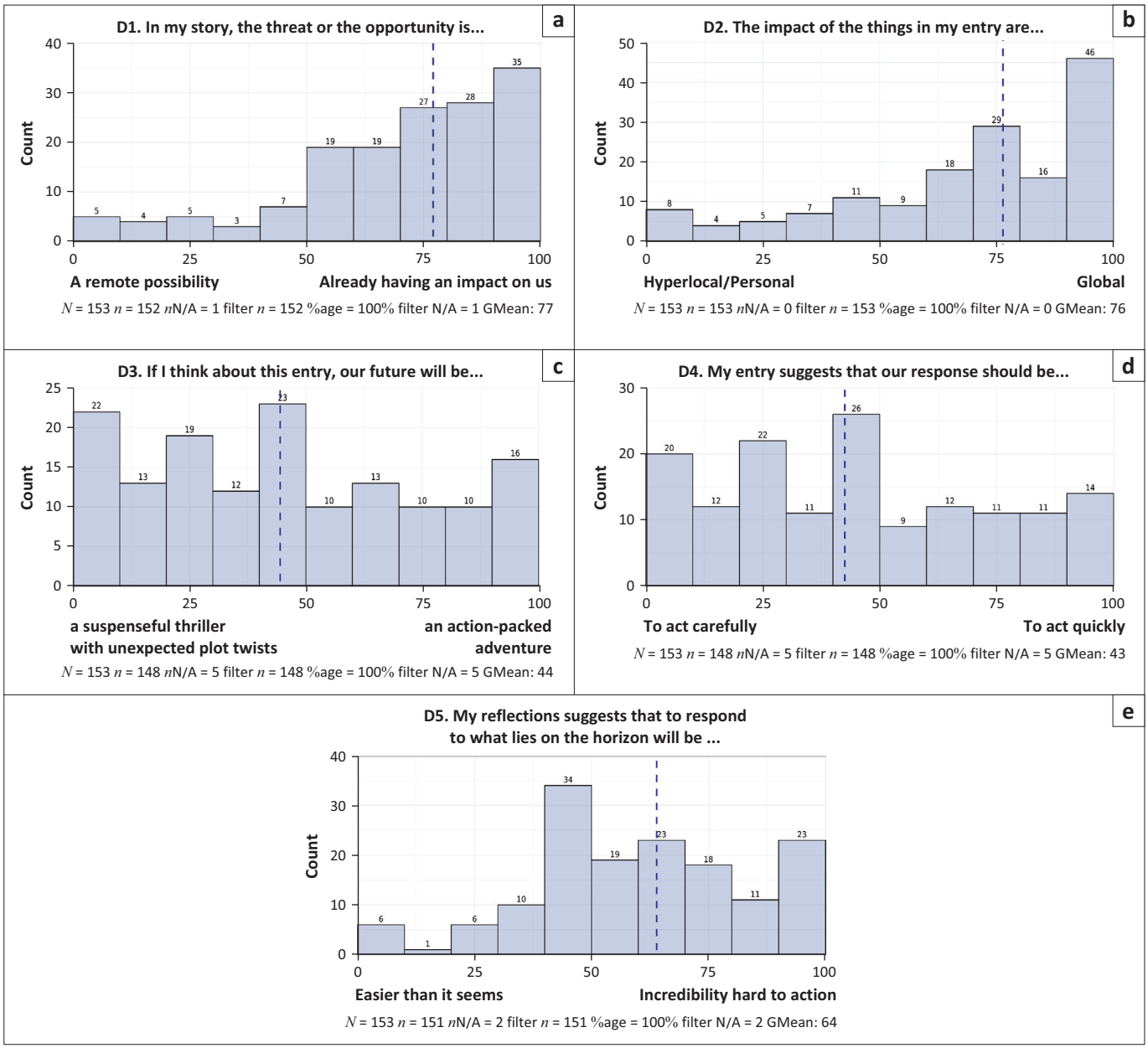


FIGURE 7: (a) Threat or opportunity being a remote possibility or already having an impact. (b) The impact of the entry is hyperlocal or personal versus global. (c) Future thoughts regarding the entry resemble a suspenseful thriller or an action-packed adventure. (d) Action in response should be careful versus quick. (E) A response to the future seems easier than expected versus incredibly hard.

their voice and ability to contribute to future-directed conversations in the workplace. Having a critical voice is both expected as an applied competency from a National Qualification Framework (NQF) level 7 graduate (SAQA 2012) and from a critical pedagogical perspective. Smith and Seal (2021) highlight approaches in critical pedagogy as emphasising the importance of democracy and equality in learning environments, stressing a co-created flexible curriculum using authentic materials, generative themes and teachable moments, and cultivating hope and symbolic resistance. The contrast in patterns for positive and negative sentiments in triad 2 (Figure 7A) and triad 3 (Figure 6A) can be utilised for generative discourse in the classroom and assignments. Self-awareness and reflexivity needs to be developed in students prone to doomsday scrolling by engaging in discussions with them and presenting these contrasts in the findings that reflect a notion of techno-utopianism or techno-scepticism. According to Dai and Hao (2018:9), techno-utopianism and techno-dystopianism diverge on the impact of technology on social progress. Students should have the opportunity to gain experience and confidence in the facilitation and participation in such conversations between different polarities and develop the skills to find realistic and balanced perspectives as professionals. This is also important to incorporate, as many students acknowledged the need for ongoing learning and education.

The ability to recognise and frame AI and other technological advancements in terms of society, government, politics and economy will bring the unique value proposition and nuance of information science to the fore in a technology-driven world. The shared responsibility and accountability of

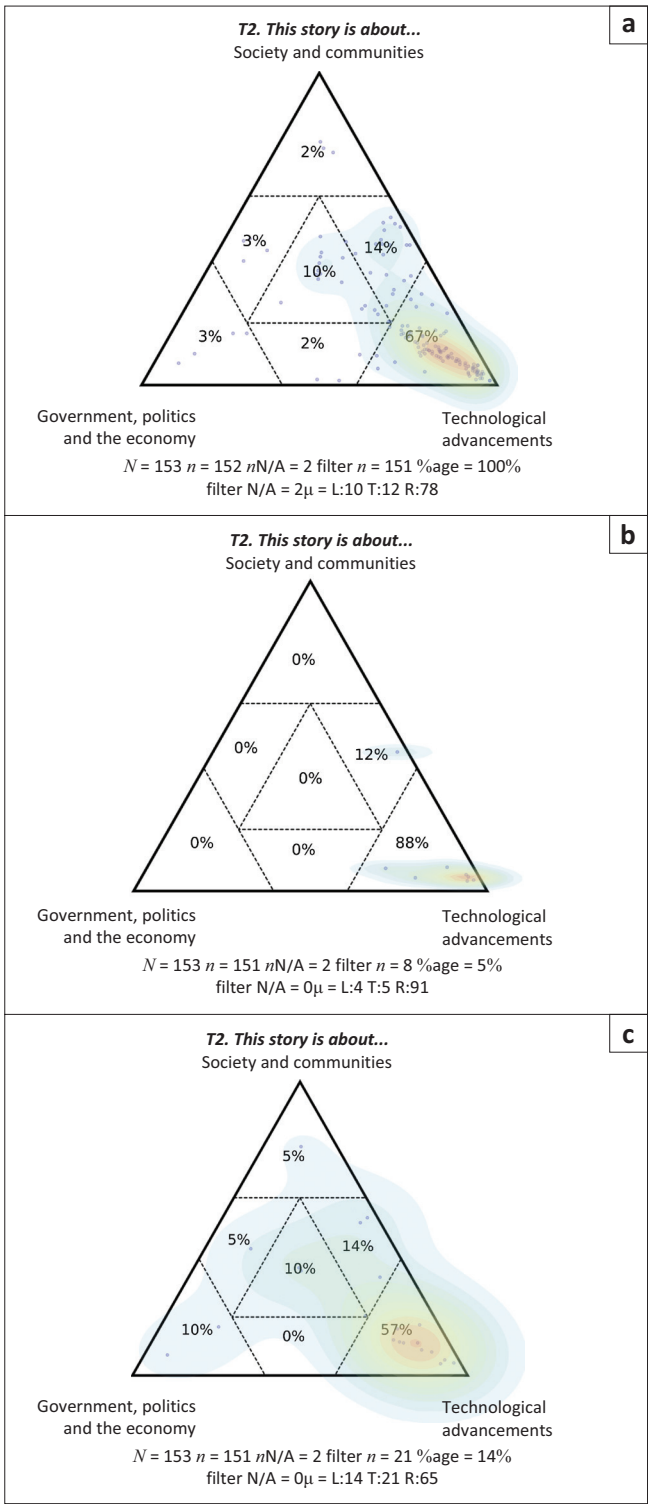


FIGURE 8: (a) The macro-environmental focus of the story, (b) the macro-environmental focus of the story: filtered by feeling very positive and (c) the macro-environmental focus of the story: filtered by feeling negative.

the private sector, government and collective action will only grow, also for issues concerning information professions. A potential understatement or underrepresentation of government and private sectors in the curriculum should be investigated. Lecturers should include such explicit and implicit outcomes to address both aspects in the curriculum and lectures. This should also influence the identification and selection of potential jobs.

The collective findings presented in this study provided lecturers, as curriculum developers and content creators, with a perspective that would not have been possible without these analyses. SenseMaker® proved to be a powerful research tool which has given everyone in the whole class a voice and placed agency back in their hands. An aspect impacting critical thinking that is often overlooked is the hidden curriculum, as lecturers are not aware of it (Rossouw & Frick 2023). The hidden curriculum reinforces a set of values and norms that are in line with the prevailing political thinking and may influence critical thinking (Hall & Smyth 2016). The analysis of the reflection on the students' future career prospects compared against the SFIA skills revealed the true nature of the student cohort in terms of where they are and where they aspire to be in the workplace, exposing this hidden curriculum in a very subtle way. SenseMaker® proved to be highly successful in addressing the third research objective of this study, namely, to find a way to include the voices of students towards appropriate curriculum content and teaching practices transformation for the careers to which they aspire.

The study, done in a cross-sectional time horizon, is limited and frozen in a snapshot moment in time. The research, therefore, needs to be conducted over a longitudinal period to reveal the shifting patterns that will come to the fore when multiple cohorts are given a voice. Further analysis of the data should also be followed up with focus group discussions to offer deeper meaning to the students' reality in a future-focused world and to investigate the possibility of transcending the role of the student from informant to design partner.

While this research touched on industry partners' voices in the form of the collaborative collective contributors to the SFIA framework (SFIA 2025), further steps should be taken to incorporate industry partners as more active voices in the co-created curriculum endeavours. The rapid developmental changes and fast-changing attitudes towards AI development deserve follow-up research to establish changes in user attitudes and behaviour, as well as changes in trust and feelings of seeing AI as a threat to students' future.

Conclusion

The perspective of the whole-class as co-creators in the curriculum gave the student a higher level of agency towards crafting their own future. By having insights into the fears and aspirations of students, a greater sense of direction can be achieved to offer solutions to challenges and develop opportunities for growth. This awareness aligns with critical pedagogy and brings equality to the learning environment. Biases and epistemic injustices are drowned out by the plurality and the multiplicity of perspectives gained, and a deliberate partnership that includes the student as a design partner can be developed.

SenseMaker® magnifies epistemic justice, casting a lens on the student as a worthy knowledge holder of their potential

TABLE 2: Micro-narratives associated with the very positive and very negative sentiment regarding technology advancements.

Very positive	Very negative
I was admitted to hospital a few months ago and I found it quite interesting that I basically did the admittance from my own cellphone after scanning a quick-response (QR) code. Even though it can be seen as a threat to admin personnel, it can be seen as an opportunity for IT professionals, because the more information systems we welcome in our lives, the more IT support we will need to service and fix these systems.	*When I think of the future, I think of a world of uncertainty and the unknown, for example, when we look at even the past year, the job of an IT professional seemed future proof; however, with the introduction of AI such as ChatGPT, it is beginning to look as if no job is safe, not even those in IT. There is a saying that goes: 'this is the worst that AI will ever be', and that saying goes to show how uncertain the future is.*
Providing myself further education about AI and how I can contribute to its development with or without highly technical skills. As well as developing those courses that may better fit and adjust to the growing technology.	*AI and automation can greatly enhance information management and knowledge. The same technology presents a threat in terms of potential job loss and can possibly create a bias in AI algorithms and privacy issues.*
I would firstly begin speaking about AI and the following topics on it: Ethical guidelines, Transparency and Accountability and Education.	*Show people that people are better at doing things than AI as we are more creative by nature.*
Hyperfocus and clarity on the topic of AI. Instead of fear mongering the threats of AI, rather recognise its potential. Educate the young and the old on how it could benefit them as long as we remain in control and do such responsibly.	*I will engage in community outreach programmes and educational initiatives to promote digital literacy among people of all ages. This involves raising awareness about issues like data privacy, online harassment and the responsible use of AI, and pushing for policies and guidelines that prioritise ethics in tech development.*

AI, artificial intelligence; IT, information technology.

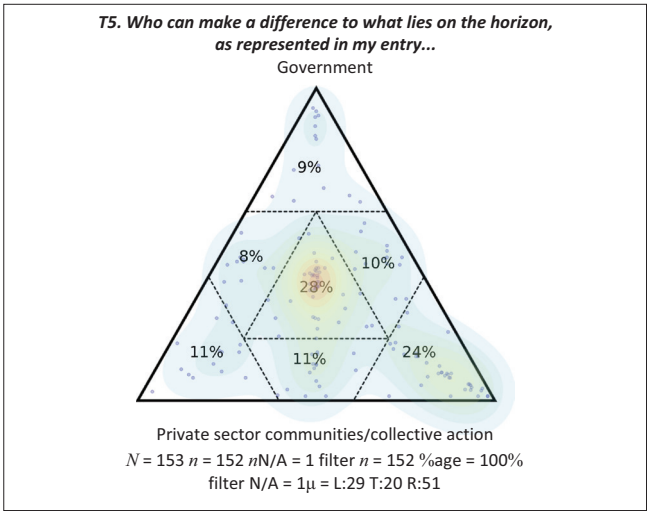


FIGURE 9: Shared accountability to make a difference in what lies on the horizon.

contribution to co-creating the curriculum. The traditional skewed power relations historically focused on lecturers as knowers and knowledge producers have shifted agency to the student as an equal partner in their personal educational journey. Not only is the student acknowledged in this way as a co-creator *in* the curriculum, but by analysing assessments of this nature as secondary data over a period of time will allow the student a co-creator role *in* the curriculum, incorporating their voice in a transformed and relevant curriculum that aligns with the skills requirements of a rapidly changing global digital world of work.

Whether attributed to Mark Twain or Grant Allen, when approaching co-creation of curriculum design in this manner, each student may rightly repeat this quote: 'I have never let my schooling interfere with my education'.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

M.A.M. is the principal researcher in this study and initiated, designed and executed the research project. E.B. is an expert in SenseMaker®, made the software available, developed the collector and conducted the analysis of the SenseMaker® data as part of a collaboration between the practical module at the university and The Cynefin Co. Both authors contributed to the writing of the article.

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Data availability

Data are not currently available as per the ethics agreement of using secondary data from assessments.

Disclaimer

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