

2030: FUTURE SCENARIOS FOR LEARNING AND TEACHING MODELS IN HIGHER EDUCATION

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ABSTRACT

Higher Education needs to be reimagined considering the exciting developments within virtual reality and artificial intelligence. As a new generation, Generation Alpha, better known as Gen Alpha,¹ is preparing for higher education, and educators are challenged to create opportunities to meet their needs. In this study, we explore an existing paradigm, scenario planning, but within an unfamiliar context – the future of higher education. We pose the question: What are the possible future scenarios within higher education that will appeal to the Gen Alpha student and a millennial parent in a post-pandemic world? As a result, we present a scenario matrix with four learning and teaching models forecast to be successful in 2030 in higher education institutions. These four learning and teaching models are based on two axes: Social connect vs social disconnect in learning and teaching and a single career option or multiple career options as the end goal for the student. Respondents of this longitudinal study are millennial parents of Gen Alpha students. Results indicate that the three main themes that will influence the learning and teaching models of the future are learning spaces and places, glass learning, and techceptance. In line with the three themes, the three major findings were that (1) millennial parents are open to hybrid learning approaches, (2) learning on screens is important, but it should be regulated and based on set standards, and lastly (3) millennial parents are accepting technology (techceptance) as a supportive tool and learning place in higher education. Overall, there was a positive shift in perspectives on higher education regardless of the impact of the pandemic. The outcomes of the research will assist higher educational institutions to strategically align the learning and teaching offerings with the needs and resources of the future student, namely Gen Alpha.

Keywords: higher education, scenario planning, Gen Alpha, millennial parents, 2030, developing country

INTRODUCTION

“The biggest threat those of us working in colleges and universities face isn’t video lectures or online tests. It’s the fact that we live in institutions perfectly adapted to an environment that no longer exists.” (Shirky 2014).

This comment by Shirky (2014) illustrates the notion of a daunting future due to the link to uncertainty, fear, and more questions than answers. In the business world, strategists are comfortable with presenting forecasts, predicting trends, and presenting future scenarios. However, trend forecasting, and scenario planning have not been integrated into higher education planning. Recent literature focuses on *coping* with current times (Núñez-Canal, De Obesso, and Pérez-Rivero 2022; Antonopoulou, Begkos, and Zhu 2023), rather than being proactive and strategic about the future of higher education. According to Janse van Rensburg and Oguttu (2022, 296), there is a need for studies that investigate the designs adopted by institutions in South Africa and on the continent in light of the rushed implementation of blended learning.

Considering the future student of 2030, we offer a scenario matrix which represents four teaching models that higher education institutions can incorporate to appeal to the Gen(eration) Alpha 2030 student. Bryan Alexander (2020) sheds light on the American higher education system and looks into the future to see what colleges and universities might look like based on changes in the world. He integrates two scientific methodologies. Firstly, he uses trend analysis to identify the drivers of the future scenario and secondly, he uses scenario planning to recognise possible future scenarios. The implementation of scenario planning in developing countries is lacking and has not yet been explored.

Using a similar approach, we present a scenario matrix which proposes four learning and teaching models that higher education institutions can incorporate to appeal to Gen Alpha 2030 students in the South African context. Insights into these scenarios could empower higher education institutions and educators to make the right decisions, mitigate risks, and reduce uncertainty in planning for the future student. Exploring scenario planning in education enables higher education institutions to react to future developments and disruptions. The scenario matrix can also assist stakeholders, such as the student, parent, and educator, to think and react more strategically.

The article is structured according to the scenario planning method of nine phases by Raymond (2020). During the nine phases, the internal and external drivers of the proposed scenarios are refined while considering the impact of a post-pandemic world. Furthermore, the implications of the proposed scenarios are discussed by means of higher education learning and teaching models. Lastly, implications for educators and higher education institutions are provided as well as areas for further study.

THE SCENARIO PLANNING PROCESS

Scenario planning is a trend foresight method in which the possible, probable and plausible future scenarios are created in consideration of the social, technological, economic, environmental and political factors (Raymond 2020). The scenario planning process consists of nine phases outlined in Figure 1.



Figure 1: Scenario Planning Process

The illustrated phases occur sequentially, but the implementation is iterative in nature. Therefore, for the purpose of this article, only the outcomes of the process will be discussed. As a result, phases 1–4 will be addressed in totality to contextualise the drivers of the study and can be compared to a traditional literature review or situational scanning process. As can be seen in Figure 2, once the question in this study was identified, the internal and external drivers were identified.

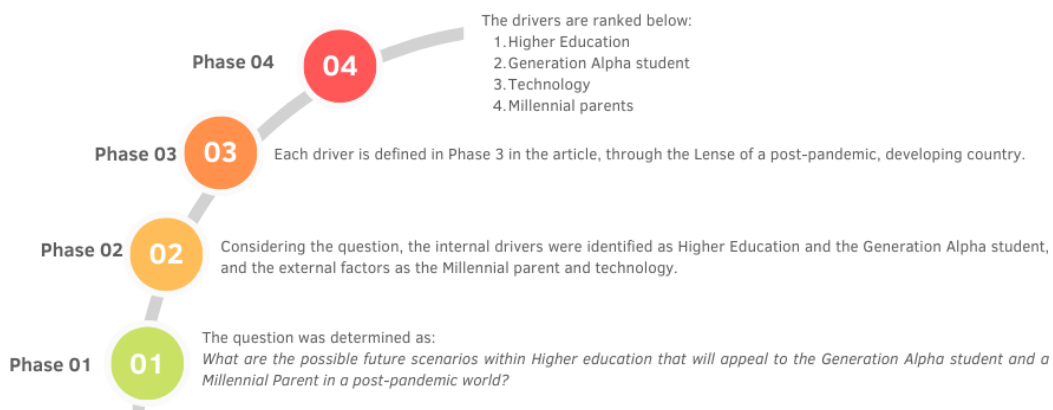


Figure 2: Summary of Phase 1–4

RESEARCH QUESTION (PHASE 1)

Technology is developing at such a fast rate that higher education institutions are struggling to

keep up with the latest innovations and consumer demands. However, at the most southern point of Africa, we are experiencing a blend of new world technologies and issues typical of developing countries. Unemployment, poverty, and lack of basic resources like water and electricity have been highlighted and escalated even more with the onset of COVID-19 and the national lockdowns (Núñez-Canal et al. 2022; Antonopoulou et al. 2023). What does this mean for the future of higher education?

The uncertainty about the juxtaposition between innovation and poverty led to the research question:

- What are the possible future scenarios within higher education that will appeal to the Gen Alpha student and a millennial parent in a post-pandemic world?

Once the research question was finalised, the drivers were determined.

DRIVERS (PHASES 2–4)

In phase two, all factors are considered, then distilled during phases three and four into only the most important drivers that will impact the future of higher education in South Africa. From the analysis conducted social changes such as generational development of Generation Alpha and Millennial parents were identified in relation to the question from phase one. Furthermore, socio-economic and technological factors such as higher education within a developing country and the development of technology within higher education were identified in relation to the question from phase one. After identifying the social, economic and technological drivers they are categorised to internal and external factors as part of the distillation phase within scenario planning.

Internal factors

Internal factors refer to those factors that directly relate to the research question (Raymond 2020) – possible future scenarios within Higher education that will appeal to Gen Alpha students. As part of phases three and four of the scenario planning process, first, higher education in a developing country and second, Gen Alpha students are described as internal factors and ranked according to their influence on future scenarios.

Higher education in a developing country

Higher education in a developing country relates to a socio-economic factor identified through the broader analysis as it is influenced by the pandemic, therefore a social and economic change. Although COVID-19 ensured a boom in online learning (Pham and Ho 2020) and education

remained a priority during the pandemic (Azzi-Huck and Shmis 2020), developing countries still face many barriers to higher education. These include financial constraints and a lack of information about available opportunities (Youth Capital 2019, 4). From the systematic review of literature identifying top articles focusing on e-learning post-COVID-19 (Fauzi 2022), we conclude that e-learning and engagement with digital platforms in education have become a top priority in higher education research.

However, literature presently focuses on reactive approaches to challenges that have occurred (Menon and Motala 2022; Maringe and Chiramba 2022; Khoza and Van der Merwe 2022; Janse van Rensburg and Oggutu 2022; Fauzi 2022), and it seems there is a lack of focus on what the future of higher education is; and what the needs of the future student might be, especially in developing countries facing economic turmoil and social inequality.

Last, recent literature focuses on a move from teacher-centred learning to student-centred learning (Zairul 2020; Islam, Sarker, and Islam 2021; Lahdenperä, Rämö, Postareff 2022). We will subsequently refer to learning and teaching (putting the student first), rather than teaching and learning.

Gen Alpha student

Generation alpha is a representation of societal change as this is a new generational group that influences demand and behaviour within society. The Gen Alpha student was born between the years 2010 to 2024 and is also known as the *glass generation* due to being born into the digital revolution (Theko 2019; McCrindle 2023). Firstly, Gen Alpha prefers working on glass screens as they have been playing on their parents' mobile devices and iPads since they were toddlers (Osmon 2020; McCrindle 2023). Gen Alpha is therefore more prone to adapt and demand the hybrid teaching and learning model which encourages both contact and online learning (Theko 2019; Osmon 2020; Jha 2020). The hybrid teaching and learning model also aligns with the generation characteristics of multi-tasking and retrieving information at a rapid pace across various information categories (Perna 2021; McCrindle 2023).

Secondly, Gen Alpha also demands a personalised learning and teaching experience (Theko 2019; Cooper 2020; Jha 2020). Personalised education creates a more connected classroom that encourages problem-solving and peer-to-peer learning (Theko 2019; Cooper 2020). Soft skills are developed through advancing the teaching and learning experience and encouraging innovation, creativity, and student readiness (Jha 2020). Innovation and creativity are achieved through integrating technological advancements such as artificial intelligence, virtual reality, satellite internet, the IoT, 5G as well as the Metaverse (Osmon 2020; Jha 2020; Lee et al. 2021).

Therefore, higher education institutions must integrate technology into curriculum development to meet the needs and expectations of future generations such as Gen Alpha and their millennial parents in a post-pandemic world.

The two internal factors of higher education in a developing country (first) and the Gen Alpha students (second) are influenced by two external drivers: firstly, Technology in higher education and millennials as parents. The external factors will influence the development of higher education and Gen Alpha as the core drivers of future scenarios from a post-pandemic perspective.

External factors

External factors refer to the social, technological, economic, environmental, and political factors that influence the direction of future development (Raymond 2020). As per phases two to four of the scenario planning process, the focus is Technology in higher education and millennials as parents.

Technology in higher education

Technology in higher education derives from the technological factor as it relates to the fifth industrial revolution development. The pandemic has caused a drastic shift from the Fourth Industrial Revolution into the Fifth Industrial Revolution, coining it as *Society 5.0* (Sarfaz et al. 2021; Thurston and Heyes 2021). *Society 5.0* encourages the integration of artificial intelligence, the Internet of Things as well as robotics (Sarfaz et al. 2021). *Society 5.0* will encourage a hybridised world where humans and machines co-exist (Thurston and Heyes 2021). At the point where mind and machine are working together, it is imperative to consider all ethical, bias and privacy barriers and address any of these constraints through the development of processes and procedures (Crompton and Song 2021).

The technological revolution will have an impact on higher education and curriculum development. Instead of focusing solely on the digitisation of educational systems, institutions should focus on developing the pedagogical system to embrace both human and digital development (Lee et al. 2021). This shift in higher education development will address the gap between Gen Alpha demands and higher education Development (Rapanta et al. 2021).

Through redesigning the pedagogical structure of higher education, students are encouraged to forecast and engage with innovative thinking. Students can engage with innovative thinking by emerging into a virtual world through the integration of virtual reality and artificial intelligence. Students will be able to create 3D designs which will represent a more realistic persona to industry expectations (Lee et al. 2021). Artificial intelligence will

support all stakeholders involved including the Gen Alpha student, the millennial parent and institutions in higher education as it creates personalised learning, assists with grading and curriculum development and encourages collaboration (Crompton and Song 2021).

Millennials as parents

Millennial parents are also recognised as the social factor within the broader analysis as this generation influences their children's (Gen Alpha) behaviour. The millennial mindset is different to those of the generations before them in many ways, especially when considering education. Millennials (born between 1981 and 1996) are prioritising education for their children, and they are embracing the digital age (Orben 2020).

Firstly, millennials have always prioritised education (WEForum 2016) and see it as a top priority for future success (Ramchurn, Roodt, and Mulaji 2021). This is still prevalent despite the numerous barriers of a developing country, such as financial constraints and a lack of information about available opportunities (Youth Capital 2019, 4). A millennial's focus is not purely on the career path as the Gen Xers before them, or on financial security as the Boomers before them (Hardika et al. 2020, 70). The millennial parent believes in studying for self-actualisation, but also in forming personality, socialising and practising problem-solving (Hardika et al. 2020, 70).

Secondly, as digital natives, millennials are more accepting of digital engagement for their children. Although the satire by Rachel Klein (in *The New Yorker* 2018) "Limit your child's fire time" (fire time = screen time) was the tendency before 2020 (Modecki et al. 2022, 1673), COVID-19 and the National Lockdowns dramatically changed the millennial's mindset on the value of technology in raising children. Millennial parents introduce their children to an environment where engaging with technology is the norm (McCrinkle and Fell 2023). Millennial parents also encourage AI and robotic interaction for their children to ensure a more nurturing experience (Theko 2019). Research has recently focused on digital parenting (Modecki et al. 2022, 1673; Yusuf et al. 2020) or balanced education in the digital age (Rahmatullah 2017); but not on millennial parents' perception on using technology in the education of their children.

FIVE POSSIBLE SCENARIOS (PHASES 5–7)

Through contextualising, ranking and ranging the internal and external drivers, five possible scenarios can be proposed as part of phases five and six of the scenario planning process. Each scenario considers the different realities that the internal and external drivers can achieve to factor in every possible future within higher education for generation Alpha (Raymond 2020,

172–177). These scenarios are then distilled into three colour scenarios in phase seven through identifying patterns within each of the basic scenarios to create a more refined future for higher education for generation Alpha (Raymond 2020, 181–188). Each scenario’s logic and narrative are then also described as per phase six of the scenario planning process to understand and contextualise the different futures expected for higher education for generation Alpha (Raymond 2020, 188–189). As part of an iterative process, the data related to the scenarios of phase six will be interpreted in phase eight of the scenario planning process (Raymond 2020, 188–189). The secondary research conducted by identifying the internal and external drivers, applying the scenario planning process and supporting the scenarios with primary data, will be contextualised into a scenario matrix as a more practical form of implementation into higher education learning and teaching models (Raymond 2020, 188–189). A summary of Phases 5–7 can be seen in Figure 3.

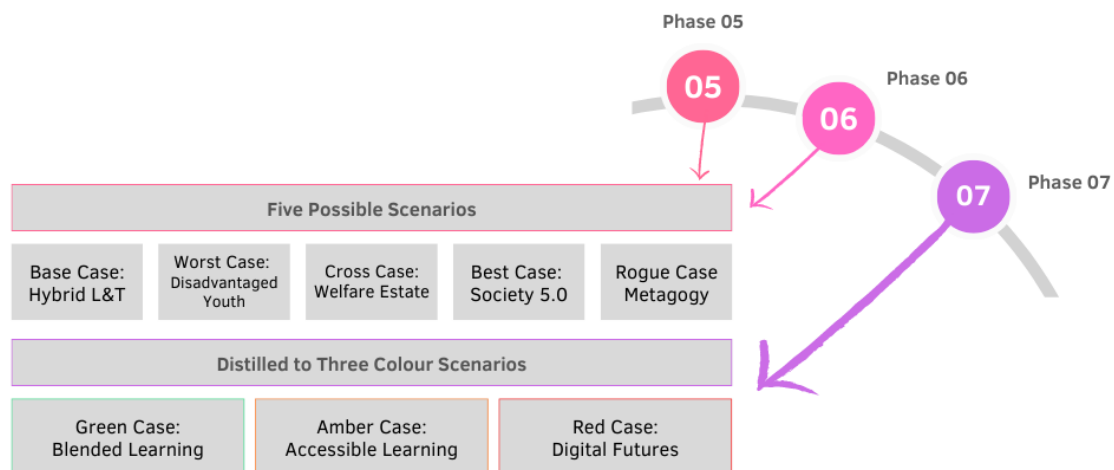


Figure 3: Summary of Phases 5 to 7

Base case scenario – Hybrid learning and teaching

The base case scenario suggests a future with little change, which aligns with the development of the present (Raymond 2020, 176). Thus, the scenario represents a future in which the future students of 2030 will remain consistent with the hybrid teaching and learning model encouraging more multi-screen engagement. This scenario aligns with that of Ahmad who identified a “human-machine collaboration” as one of the main future scenarios for higher education and digital transformation (Ahmad 2019, 225). Because of the pandemic, higher education institutions were forced to fully adopt online teaching and learning strategies ensuring an equal and strong technological structure including technologies such as video lectures, e-books, online courses, and online verification (Penrod 2023; Valeeva 2020).

Best case scenario – Disadvantaged youth

The best-case scenario suggests a future for the good of society in which the drivers continue to develop (Raymond 2020, 176). In this essence, the scenario embraces the continuous technological development within education, increased by the implications of a post-pandemic environment. The scenario will be focused on embracing Society 5.0.

As Society 5.0 represents a future where humans and machines co-exist, it will enable innovation with equity (Thurston and Heyes 2021). This could also assist in bridging the gap between education and technology by creating accessibility in higher education for underprivileged youth, such as providing computer facilities to assist in their learning.

The scenario further focuses on providing quality education through staying up to date with the advances from the fourth industrial revolution such as the integration of 5G and block chain technology (Theko 2019). Other technologies include short online learning based on Gen Alpha's desire to innovate in the world of work through fast online learning instead of higher education (Theko 2019). The increased demand for online learning will provide higher education institutions with the opportunity to develop their short-learning programme offerings to suit the needs of the post-pandemic generation (Ahmad 2019, 230). Technological developments such as block chain technologies will be embraced by the future students of 2030 and their parents. This scenario aligns with the second future scenario recognised by Ahmad (2019) where humans and machines are also forecast to co-exist.

Worst-case scenario – Welfare estate

The worst-case scenario represents a future in which social, cultural, and civic factors are threatened (Raymond 2020, 176). Thus, the scenario turns its focus to the continuation of excluding the less fortunate from education in a developing country and the youth's disadvantage towards obtaining and maintaining a life in higher education due to external threats specifically economic such as a lack of electricity, poverty, and financial constraints as well as internal threats such as families disowning their children with the slightest improvement in their education and knowledge.

Cross-case scenario – Society 5.0

The cross-case scenario considers both opportunities and threats and accepts an unpredictable future (Raymond 2020, 176). Considering both the opportunity presented in accessible and quality higher education for the future and the threats still posed to the disadvantaged youth, the fourth scenario is constructed. This scenario considers both best- and worst-case scenarios which led to the introduction of a "community engagement programme" as the cross-case

scenario. This scenario enables disadvantaged youth to have access to quality education.

Tertiary institutions can achieve accessibility by the integration of project-based learning in which students work together to solve a problem residing within their community. In this case, it creates accessible and quality education for the unprivileged student of 2030. This scenario considers the case study of Diepsloot Combined School where the objective is to create accessibility and quality education through community engagement and collaboration (Abraham 2022). The scenario, therefore, suggests an outcome in which a Fifth Industrial Revolution community centre is established with internet access, security, and commuter options. This scenario could inspire government funding if initiated in government-regulated societies.

Rogue scenario – Metagogy

The rogue scenario inspires an unimaginable outcome and requires lateral and visionary thinking (Raymond 2020, 177). The scenario suggests higher education streamed through the metaverse resulting in fully automated and virtual learning and teaching models (Wunderman Thompson 2021). Metagogy4IandU presents higher education and the future student of 2030 with the opportunity to engage with virtual realities. Realities enabled by technologies such as 5G were discussed during the external factor analysis. In this scenario, there is a machine-embraced approach, with minimal to no physical engagement with the educator or the educational space.

The next step in the scenario planning process is to distil the five scenarios into three scenarios.

THREE COLOUR SCENARIOS (PHASE 7)

As seen in Figure 3, the three scenarios are based on a colour system – green, amber, and red. The colours are allocated based on the amount of change needed for this scenario to realise in the future. Green is therefore a scenario based on existing patterns, amber based on a few changes and red based on many changes to existing patterns.

Green scenario – Blended learning

The green case scenario refers to a scenario that has little to no influence on the future outcome as *existing patterns* of the scenario are evident within the industry. The green scenario is therefore based on an integration of the base and worst-case scenario as defined in phases five to six (Raymond 2020). The green case scenario represents a blended teaching and learning model which has been introduced into the higher education curriculum and is still evolving.

Amber scenario – Accessible learning

The amber case scenario has a *medium to low risk* in the future and takes caution in the development of the scenario (Raymond 2020). The amber case scenario is therefore based on the best-case scenario as defined in phases five to six as it represents some adjustment and change to appear within the industry. The amber case scenario represents accessible learning, which is a developing initiative, especially within developing countries to close the gap between technology and higher education.

Red scenario – Digital futures

The red case scenario implicates a *high level of change* which can represent certain challenges to the development of future scenarios and anticipates all possibilities. The red case scenario is therefore based on the cross and rogue scenario which provoke change in the industry, and both are dependent on the advancements of the Fourth and Fifth Industrial Revolution technologies. The red case scenario represents digital futures in which the scenario matrix has been created that addresses the possible needs of Gen Alpha in a post-pandemic world.

VALIDATION AND REFINEMENT (PHASE 8)

The next step in the scenario planning process (Phase 8) is to collect primary data that either confirms or disproves the scenarios in Phase 7 (see Figure 4).

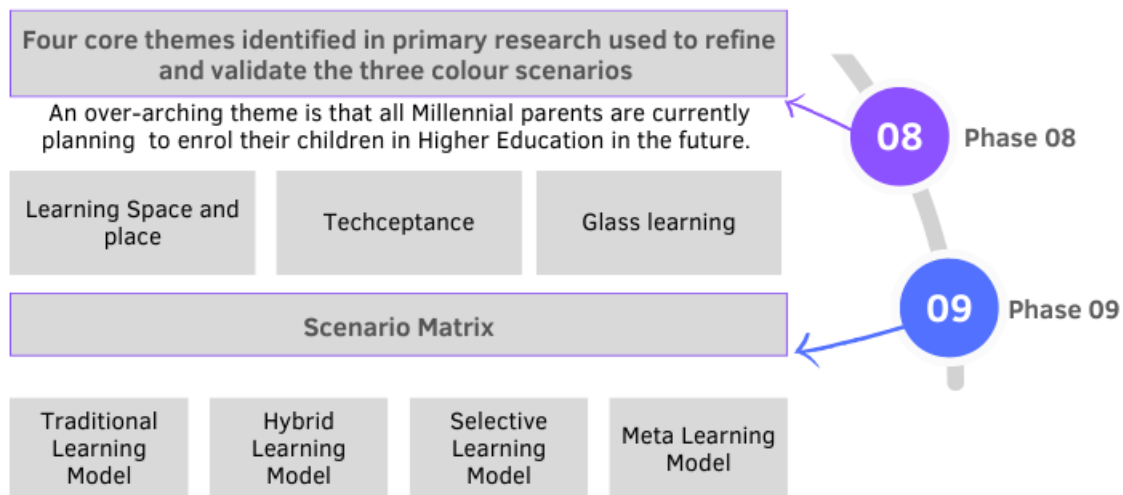


Figure 4: Scenario Planning Phase 8 and 9

The three colour scenarios are adapted and refined to inform the final forecast using primary data as discussed next.

Primary data (methods and results)

For this longitudinal study, qualitative data was collected through semi-structured interviews with a purposeful random sampling method on two testing occasions in 2021 and 2023. Respondents were chosen based on the following inclusion criteria: if they lived in the chosen urban area, were born between 1981 and 1996 and had Gen Alpha children – born from 2010 onwards. The sample included ten respondents representing different socio-economic and cultural backgrounds based on their careers and demographic information (age, domicile, occupation, marital status, education status). The respondents were the same 10 people in 2021 and in 2023. Respondents represent the millennial parent of Gen Alpha children in an urban area (population of approximately 2,8 mil people) in a developing country. Questions were focused on the parents' perception of their children's current experiences in education and their current expectations of higher education for their children. The same questions were presented to the same respondents in 2021 and 2023 to establish whether the emotions and opinions (the Zeitgeist of the pandemic) extended after the pandemic as well. The data is analysed with an interpretive focus, to understand the meanings and interpretations millennial parents gave to the external and internal drivers presented in the study. For this purpose, a thematic analysis of the two data sets was conducted. See Table 1 for an outline of the data analysis method.

Figure 5 illustrates the demographic data of the participants representing the millennial parent and Gen Alpha students.

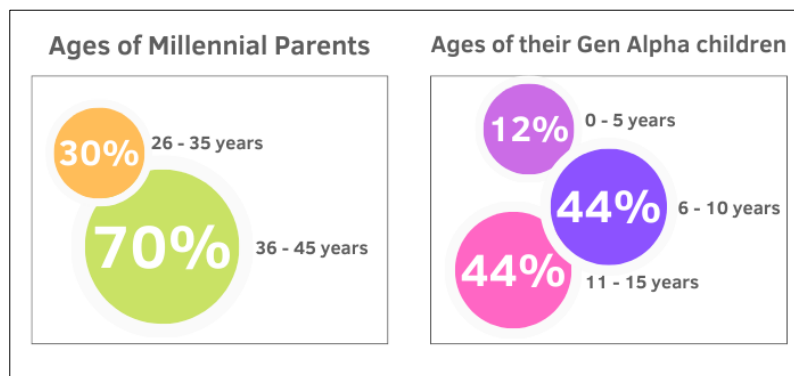


Figure 5: Ages of Respondents

Gen Alpha and the millennial parent are influencing the future direction of higher education in a post-pandemic world through their demand for a balanced digitised future. Higher education is showcasing an evident shift into a hybrid space where different technological advancements are to be considered with more than half of participants demanding a balance

Table 1: Data analysis method

Research question: What are the possible future scenarios within higher education that will appeal to the Gen Alpha student and a millennial parent in a post-pandemic world?								
Drivers	Questions (only questions relevant to this study posted here)		Respondent	Data analysis	Participant quoted	Overarching themes from responses		
Higher Education	Q3	What is your child(ren)'s current interest in future studies and careers?	10 Millennial Parents: 2021 and 2023	Thematic coding	"Higher education is not the only way to contribute to the world, but it does from a very good basis. If they can get the education that university provides together with being open-minded (such as entrepreneurs) it will be ideal." (Part 2). "With the economic climate in the country I would prefer her to go study overseas. At this point I would prefer to immigrate and let her study there." (Part 4).	Millennial parents are currently planning to enrol their children in higher education in the future		
	Q4	Are you considering higher/tertiary education for your child(ren)?						
	Q14	What is your opinion on the integration of AI and VR into your child/children's education?						
	Q16	What do you think will be best for your child in a Higher Education space-online learning or contact learning?						
	Q17	Will the future generations still study the way we used to, or did this pandemic change our expectations of Higher Education completely?						
Generation Alpha Students - 2030	Q9	How much screen time is your child/children allowed per day					"Multiple screens – video call and game at same time." (Part 1). "Multiple screens evident. P C and laptop and split screen with games." (Part 3).	Glass Learning
Post Pandemic South Africa - Lense	Q1	Explain the effect of the pandemic and the lockdowns on your child(ren)'s education					"There should be a balance between what they need to develop and to survive" (Part 2). "With his personality he needs to be socially interactive with his peers, but online is the way of the future, especially in the field we want him to follow." (Part 7). "Both as the child required personal engagement as well as digital resources to learn more efficiently." (Part 8).	Learning spaces and places – hybrid learning models
	Q13	Do you think there can be innovation with equity? (you can refer to the inequalities created by technological innovation here)						
	Q15	Do you think South Africa can implement these technologically advanced resources into the educational sector?						
Technological advancement	Q10	Does your child learn and engage with educational content via an iPad or textbook?					"There needs to be a balance. There has to be human interaction together with robot interaction. Also not only human any more – he needs the exposure to AI." (Part 5). "Encourage the integration of AI and VR. Child already interacts with these technological advances a lot." (Part 7). "Children have a robotics class." (Part 8)	Techceptance
	Q11	Do you as a parent encourage robotic interaction with your child/children's upbringing?						
Millennial Parents	Demographic questions							

between online and contact learning. The shift into a hybrid learning space will address Gen Alphas needs to engage with multi-screens and technological advancements such as AI, VR, and robotics. Millennial parents are showcasing their support in the development of their children's educational future in consideration of the economic conditions of a developing country.

One question that arose throughout the research process was whether the pandemic would have long-term effects on the opinions and future views of the respondents. Therefore, Figure 4 reflects how the perspective of the respondents has changed over time, considering the four drivers of this study.

Figures 6 to 8 represent three core themes including Learning spaces and places, Glass learning, and Techceptance.

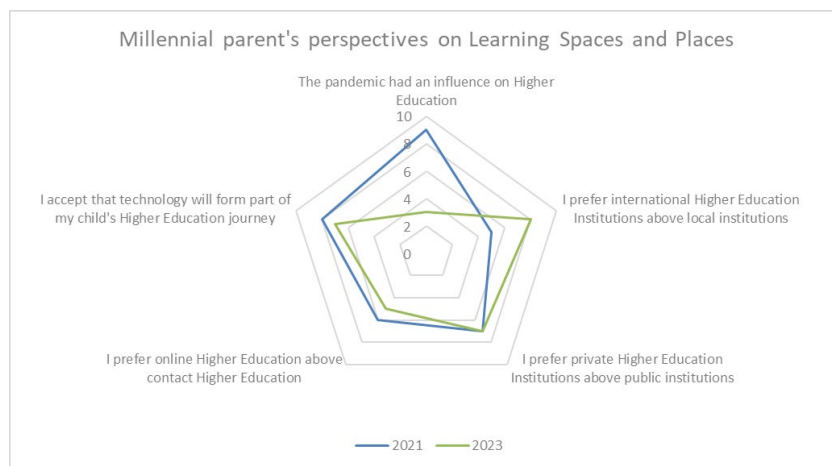


Figure 6: Learning Spaces and Places

As per Figure 6, there was a *positive shift* in perspectives on higher education and the impact of the pandemic. Initially, millennial parents believed the pandemic would impact greatly on their child's higher education journey, but now they are less concerned about the effect the pandemic may prove to have had. Parents accept technology in higher education and the integration of the hybrid learning and teaching model. Respondents still prefer international and private education due to the perception of a higher level of academic standards.

There was a shift from traditional career paths (such as mechanical engineering) to creative career paths (such as International Cricket player from 2021 to 2023). This finding was further explored in Phase 8. The amount of trust in the educational system of a developing country remains constant as economic constraints still pose a threat to the development of higher education and accessibility to future generations. Because of the effects of the pandemic

on the economic conditions of a developing country, millennial parents applied some regulations to digital interaction, such as regulating screen time to an average of 2–4 hours.

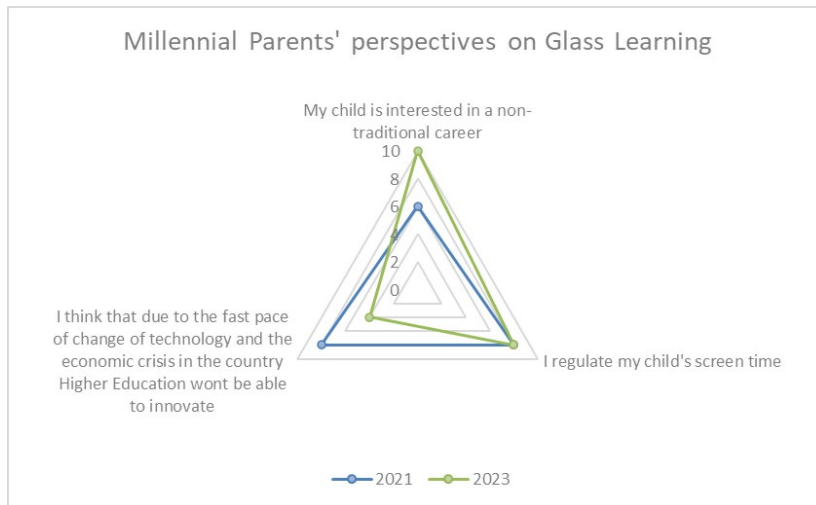


Figure 7: Glass Learning

Technological advancements remain a supporting factor in the development of education with most millennial parents encouraging robotic interaction as well as AR. However, millennial parents demand a balance between “traditional” and digitised education as well as ensuring safety regulations are implemented within the digitised educational system. Mot Gen Alpha students have access to the internet making it accessible for them to engage with technological advancements.

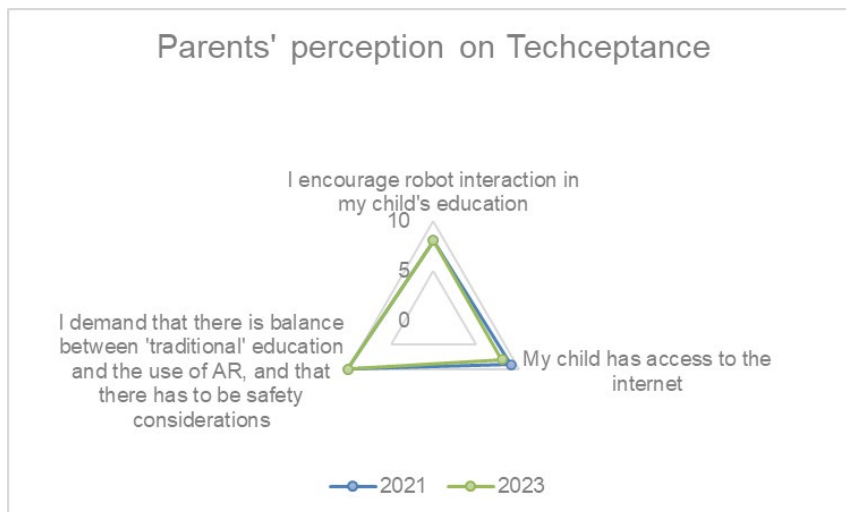


Figure 8: Techceptance

To conclude Phase 8, the primary data collected *confirmed the literature* to refine the three colour scenarios. The final scenarios are described in more detail.

Green case scenario – Validation and refinement

The green case scenario represents the hybrid learning and teaching model which considers the adoption of online learning and digitisation as well as the economic constraints of a developing country. Blended learning can further be explored in terms of flexible learning, hybrid learning or HyFlex learning, as long as structures are in place for educators to regulate the hours online or onsite (Dlamini and Reikai 2022). Results confirmed that the national lockdowns led to an increase in online engagement. However, 73 per cent of primary and secondary institutions utilise traditional textbooks showcasing the transition into the hybrid teaching and learning model. Furthermore, Gen Alpha parents support the shift to a hybrid system with 55 per cent preferring both online and contact learning. Parents demand a balance between the physical and digital worlds. Even though this shift to a digitised educational system is considered there are certain economic constraints that a developing country presents. Due to financial constraints, 20 per cent of recipients confirmed they do not have access to Wi-Fi and the national lockdowns have caused further distress as children miss school due to a lack of access to online learning. It was confirmed by 73 per cent of respondents that they still greatly depend on textbooks with 36 per cent preferring contact learning.

Amber case scenario – Validation and refinement

The amber case scenario represents accessible learning, where Gen Alpha has access to technological developments, therefore breaching the gap between higher education and technology. This gap can be addressed by providing digitised facilities that are available to students to increase accessibility to teaching and learning materials. The establishment of digitised facilities within a developing country should consider the necessary security and transportation implications. The results indicate that 80 per cent of Gen Alpha children have access to uncapped Wi-Fi and accessibility to 5G data which illustrates the advanced access to technology daily. This also highlights the digital divide caused by the incorporation of technology in learning. Data further illustrate that even though accessibility is viable, it is restricted by developing countries' educational systems with 64 per cent of respondents confirming they do not trust the developing countries' educational systems and therefore prefer international and private education. This statement is confirmed by 39 per cent of respondents preferring international education, 34 per cent preferring private education and 58 per cent stating that it depends on the accessibility of international and private education. Interestingly, even respondents from lower LSM groups indicated that they are interested in private education, as they do not trust the public school system and perceive private higher education

institutions to have higher standards.

Red case scenario – Validation and refinement

The red case scenario represents a digital future which aims to present an advanced and quality educational system that integrates the Fourth and Fifth Industrial Revolution technologies such as the Metaverse. Data collected illustrated the accessibility and development of technology with access to satellite internet, multi-screen engagement and virtual engagement. Respondents prefer both contact and online learning methods (55%) with 100 per cent acknowledging and encouraging AI and VR integration into education. Based on the data collected it is evident that different needs and expectations arise from Gen Alpha and millennial parents.

To address these needs the scenario matrix was designed consisting of four possible learning and teaching models for higher education, including the traditional learning model, the hybrid learning model, the selective learning model and the meta-learning model.

Each colour scenario from Phase 8 represents a realistic future for higher education. The scenarios all consider the drivers of higher education development, the Gen Alpha and millennial parents' needs and expectations as well as the integration of technological advancements into higher education.

In Phase 9 we explore the implementation of the most possible, probable, and plausible future scenario for the development of learning and teaching models within higher education.

SCENARIO MATRIX (PHASE 9)

Through the investigations in this study, it was found that there is no single possible future scenario for higher education learning and teaching models. Rather, a scenario matrix (Figure 9) is created with four learning and teaching models that higher education institutions can integrate to appeal to the Gen Alpha student in 2030.

The scenario matrix is based on two basic axes from the scenario planning process:

Horizontal axis – Human embraced vs Machine embraced

The two scenarios on the left side of the matrix are based on social disconnect – a learning model where students can engage with education without engaging with a human. This includes all forms of digital learning. The two scenarios on the right side of the matrix are based on social connection – a learning model where students want to engage with the educator physically or digitally, and with the institution physically.

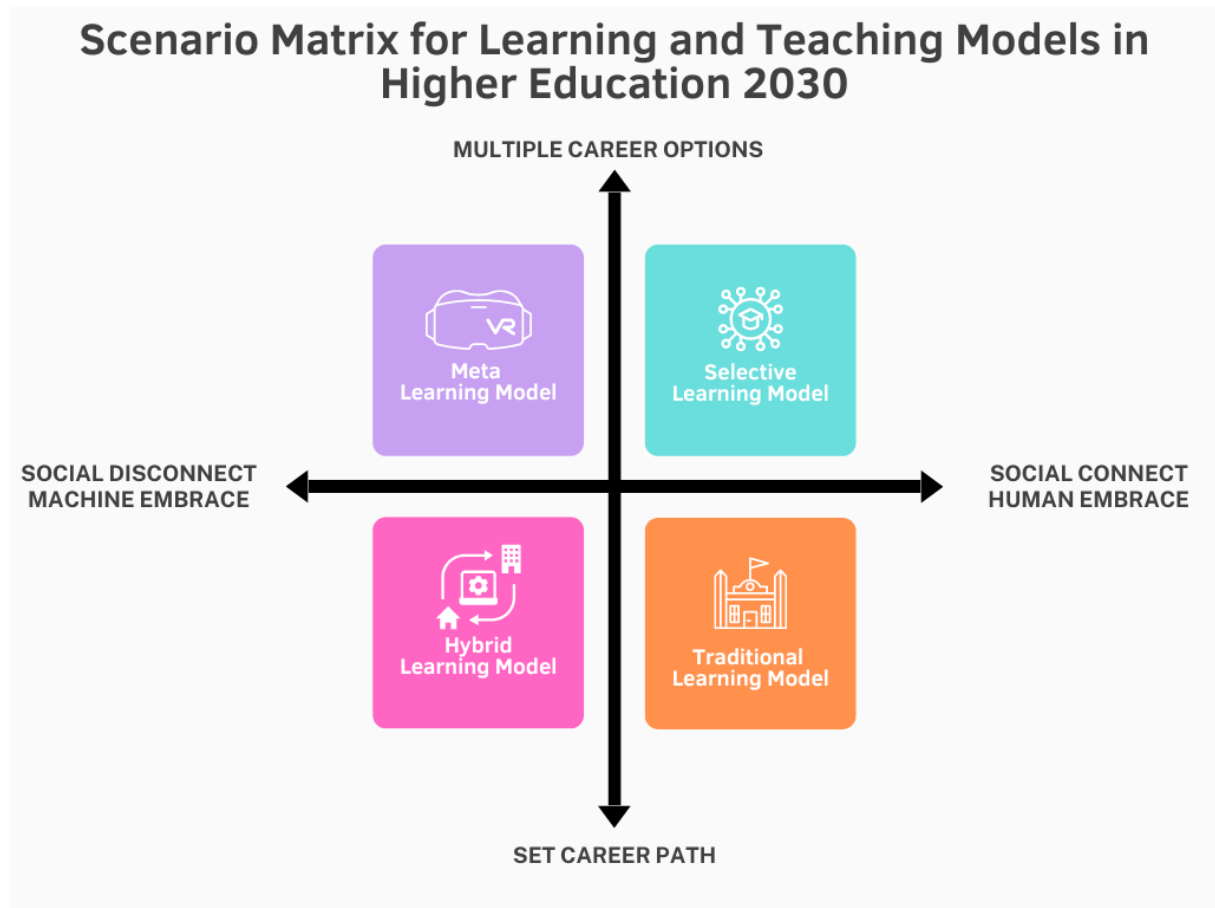


Figure 9: Scenario Matrix

Vertical axis – Multiple career options vs Single career option

The two scenarios on the top of the matrix are based on multiple career options – a learning model where students can bundle their own programmes or modules to prove competence for a variety of careers upon graduation (or badging). The two scenarios at the bottom of the matrix are based on a single career option – a learning model where the programme and modules are structured in such a way that the student is competent in a specific career, such as a medical doctor.

By placing the two axes together, we can further expand on four possible future learning and teaching models. One assumption that is core to the forecast is the *successful integration of and accessibility to 5G in developing countries*. This access will allow students and higher education institutions to operate virtual reality-based apps enabling Gen Alpha students to engage with an alternate universe where they can either explore human anatomy, astronomy or even geography by virtually travelling across the world (Mokhtar and Ahmad 2020).

The four learning and teaching models are further explored, starting from the right bottom corner of the scenario matrix.

Traditional learning and teaching model

The traditional learning model represents a standardised higher education system in which traditional career paths are encouraged by millennial parents. Forty-five per cent of millennial parents from the sample confirmed that their children would like to follow a traditional career path such as becoming a veterinarian, a mechanical engineer, a lawyer, or a scientist. Another theme from 2021 to 2023 in pop culture is Nostalgia (looking back at one's lived memory with a positive outlook), which drives millennial parents to "push" their children towards enjoying the same experiences they had in life and in their higher education journeys.

Therefore, there is still a demand for traditional learning – face-to-face interactions with illustrations and one-on-one engagement with the facilitator. In the post-pandemic world children still aspire to obtain traditional career paths due to the influence of millennial parents. The data collected showcases that after the pandemic parents have become strict regarding the future development of their children. Furthermore, higher educational institutions in developing countries reside in standardised systems due to economic constraints. Sixty-four per cent of respondents confirmed that during the pandemic children were still engaging with textbooks due to their geographical position and limited access to digital devices.

Hybrid learning and teaching model

The hybrid learning model illustrates the integration of contact and online learning within higher education institutions. Fifty-five per cent of millennial parents demand a balance between contact and online learning as illustrated in Table 1. The hybrid learning model addresses the Gen Alpha demand for digitisation and hyper-fast reality. All Gen Alpha students within the sample have access to a digital device such as a mobile phone, iPad or computer and are allowed regulated screen time. The hybrid learning model also embraces the integration of AI and VR with all millennial parents acknowledging the importance of integrating advanced technologies into education in a regulated manner. Millennial parents confirmed that even though Gen Alpha children might consider a traditional career path they would prefer completing their studies through an online course.

Selective learning and teaching model

The selective learning model encourages more accessibility towards higher education, quality teaching and learning strategies as well as embracing the Fourth and Fifth Industrial Revolution technologies. It is evident from the traditional learning model and the hybrid learning model that Gen Alpha students and millennial parents have become more flexible towards the teaching

and learning strategies related to various disciplines. Gen Alpha demands more digital learning at a fast pace as discussed in phase two of the scenario planning process. This demand creates the opportunity for short learning programmes to be introduced. Short learning programmes can be introduced for both online and contact learning and Gen Alpha students demand online learning with 73 per cent of millennial parents preferring contact learning as per the data collected.

Meta-learning and teaching model

The meta-learning model encourages metaverse education through the integration of AI and VR at a more advanced level by embracing the technologies of the Fifth Industrial Revolution. The metaverse supports multi-screen engagement and multi-world creation. The meta-learning model assists in the integration of micro-credentials and the block chain approach to learning, where credentials do not only exist in the physical world but in the digital realm as well. This approach allows students to package their modules and programmes in a manner that is flexible according to their career trajectory, but also to their skills and the changing job markets. The meta-learning model takes into consideration the traditional, hybrid and selective teaching model as it considers the influence of all drivers, namely higher education and Gen Alpha (internal) as well as technological advancements and millennial parents (external).

To conclude Phase 9, the implications of the scenario planning matrix are outlined to represent the outcomes of implementing the learning and teaching models derived from the scenario matrix into higher education development.

IMPLICATIONS FOR LEARNING AND TEACHING

The learning and teaching models introduced in phase nine (Scenario Matrix) can have the following implications on learning and teaching within higher education:

Improved learning experiences: Learning and teaching models that consider future development enhances the learning experience of both the learner and educator as the focus is more on real-world application and integration with current systems thinking. For example, implementing the hybrid learning and teaching model can enable students to engage with theoretical context in a contact learning space and to enrich their knowledge and understanding by connecting with industry experts through a virtual space.

Strategic innovation: The learning and teaching models encourage more strategic thinking regarding rapid technological development, economic implications from a recession and the change in demand from future generations. Higher education institutions can engage with

policy makers and innovators in a timely manner to address these concerns before it becomes a reality.

Addressing the digital divide and access to higher education: Higher education will become more accessible to all learners through the integration of 5G into the institution's service offerings and therefore giving access to technological advancements.

Higher quality education: There will be an increase in the quality of education as more innovative and critical thinking skills are obtained with a balanced integration of technological advancement such as augmented and virtual reality into higher education curriculum.

Alignment to world of work: There will be a strong alignment between the world-of-work environment and higher education curriculum as the curriculum will be up to date with technological demand as the learning and teaching models consider the changing demand of future generations (Gen Alpha). For example, introducing a digital literacy module that aligns with industry requirements.

Community engagement: The wider community is engaged in growth of the Higher Education institution as the proposed learning and teaching models drive accessible and balanced higher education systems by encouraging traditional and hybrid pedagogy. For example, considering the establishment of community centres with accessibility to 5IR technology.

CONCLUSION

Technological advancement and innovation within higher education present the opportunity to develop innovative learning and teaching strategies. The transformation and development of the higher education curriculum are driven by four drivers: higher education, Gen Alpha, Technological advancement, and millennial parents. The four drivers informed the proposed scenario matrix which represents four possible future scenarios derived from the scenario planning process – a series of nine phases to predict future forecasts. Applying the scenario planning process to higher education development presents the field with a variety of possible, probable, and plausible future scenarios. This enables the field to adequately prepare for future disruptions.

Considering the disruptions caused by the economic constraints of a developing country in a post-pandemic world, the research question of “What will the future of higher education look like?” is being addressed. Economic constraints such as poverty, unemployment and a lack of basic resources influence the future of higher education development. The future scenarios, therefore, address the juxtaposition between poverty and innovation towards higher education development. In support of this claim, the demands of future generations and higher education

institutions in a developing country were explored.

We focused our research on millennial parents of Gen Alpha (born between 2010 and 2024) children – the future higher education students of 2030. Through our research Gen Alpha can be seen as a highly digitised generation, representing the glass generation, which thrives on multi-tasking and personalisation – creating the need for a hybrid learning and teaching model. Millennial parents expect a balance between online and contact learning and therefore regulate Gen Alpha's screen time which has also been influenced by post-pandemic constraints. Most of the Gen Alpha has access to the internet, making it more accessible to engage with technological advancements. Millennial parents believe that private and international higher education institutions are better equipped to address the needs of Gen Alpha due to their high standards and ability to integrate technological advancements. Gen Alpha's parents encourage engagement with AI, VR and robotics within higher education as long as there is a balance and safety regulations are adhered to. The data shows that the pandemic initiated a positive shift in perspectives regarding the development of higher education institutions into a hybrid learning and teaching model. The pandemic has influenced Gen Alphas' career path from a traditional to a creative industry direction.

To address the various demands of Gen Alpha, the scenario matrix represents four possible future scenarios for higher education learning and teaching models including the traditional learning and teaching model, the hybrid learning and teaching model, the selective learning and teaching model and meta-learning and teaching model.

Further areas of research include investigating the regulations involved in the integration of technological advancements in higher education, exploring developing technologies in higher education, exploring places and spaces of higher education learning as well as understanding the next generation's needs following Gen Alpha.

The scenario planning process described in this study could be applied in other contexts and therefore, could inspire higher education institutions to consistently analyse and forecast future students' needs and expectations. It also encourages higher education institutions to embrace the Fifth Industrial Revolution technologies to push academic boundaries and encourage innovative learning and teaching strategies.

NOTE

1. The new generations are known by their abbreviated nomenclature, e.g., Gen Z or Gen Alpha. It is written out only once in this article, under the Abstract.

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