

## Chapter 6

# Human-Centred Artificial Intelligence in Progressive Education: Unravelling the Benefits and Challenges in Qatar's HEIs



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**Abstract** Algorithmically generated personas (AGPs) can provide actionable insights into the needs, preferences, and behaviours of stakeholders, including Applicants, Students, Alumni, Faculty, and Staff (ASAFS) for progressive education at higher education institutes (HEIs) in Qatar. AGPs empower data-based decision-making, and contribute to progressive education by representing stakeholders in an empathic format. This chapter sheds light on the pivotal role of alumni, showing how

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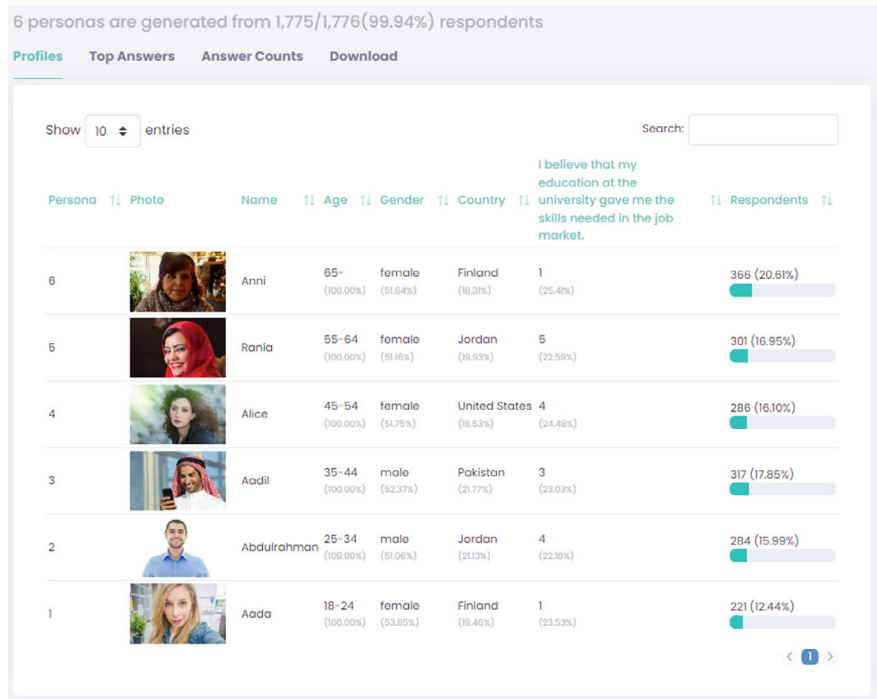
the innovative approach of using personas enables the “beyond education” concept, while providing strategic foresight for HEIs in Qatar. Machine learning models can generate AGPs as humanised representations of these key stakeholders. Building on our multi-year experience in studying AGPs, we argue that these personas can significantly aid HEI decision-makers in designing more learner-centred and inclusive curricula, pedagogy, and assessment via empathic understanding. While AGPs have been prevalent in marketing or design, their potential remains largely unexplored in HEIs.

## 6.1 Introduction

This chapter’s key themes and focus are the advocacy for applying human-centred artificial intelligence (HCAI) and data-driven persona generation in the context of progressive education within Qatari **higher education institutions** (HEIs). We focus on the potential of humanised representation of analytics data, using algorithmically generated personas (Nielsen, 2013b; Nielsen et al., 2015; Park & Kang, 2022; Pruitt & Adlin 2010) in the context of Qatar’s progressive education landscape. Rooted in student-centred learning, progressive education is a pedagogical approach to interdisciplinary instruction and developing critical thinking skills (Howlett, 2013; Levi & Marchionini, 2019; Reese, 2001; Ylimaki, 2011). The chapter examines the benefits and challenges of using **algorithmically generated personas** (AGPs) to represent key stakeholders, such as **Applicants, Students, Alumni, Faculty, and Staff** (ASAFS), and its implications for practice, policy, and future research. Despite the growing interest in progressive education, the benefits and challenges of the student-personas approach, particularly in the context of HEIs that form a strategic imperative for Qatar’s societal development, remain largely unaddressed.

This chapter attempts to fill this gap by highlighting the benefits and challenges of comprehensively studying one aspect of progressive education at HEIs in Qatar. Specifically, we focus on employing AGPs to express the experiences of key stakeholder groups (i.e., the ASAFS) at HEIs in Qatar of our proposed conceptual foundation of the progressive education journey discussed below (Alves et al., 2010; Falqueto et al., 2020; Ferrero-Ferrero et al., 2018; Logermann & Leišytė, 2015). By examining the perspectives and needs of these ASAFS groups, we can gain a deeper understanding of the effective implementation and continuous improvement of progressive education and “beyond education” that refers to areas, concepts, or ideas that extend past the scope of formal learning, encompassing broader aspects of life, society, and personal development (Cunningham, 1992; Grace & Grace, 1995; Meyerhoff, 2019) practices in Qatari HEIs. Figure 6.1 shows an AGP listing of the personas representing alumni of a Qatari HEI who responded to a survey.

Much of the foundation of this chapter is based on our extensive and world-leading research on data-driven AGPs, with our work published in esteemed outlets like the MIT Technology Review and multiple first-class ACM conferences and journals. Our expertise, initially invested in these contexts, has been catering to the unique



**Fig. 6.1** An AGP listing (i.e., cast) of personas representing alumni of a Qatari HEI who responded to a survey. The personas were generated using Survey2Persona, an AGP system developed at Qatar Computing Research Institute

needs of HEI stakeholders. We have received previous recognition for our work, including a Facebook-funded research grant to build data-driven MENA personas, and a grant in the education domain via a project funded by Hamad Bin Khalifa University (HBKU). In 2020, our work on AGPs was honoured with an “Innovation of the Year” nomination, and an award from the Qatar Foundation (QF).

In this chapter, we illustrate the use of a mixed-methods approach, combining both qualitative and quantitative data with the application of artificial intelligence (AI) and machine learning (ML) tools, to construct AGPs as humanised data representations of the key stakeholders. The mixed method combined both numerical and textual data. The AI and ML approach leverages large language models (LLMs), and sentiment and topic classification methods. These personas are invaluable tools for decision-makers in Qatari HEIs to develop and refine key performance indicators (KPIs) based on the needs, behaviours, and shortcomings expressed in the personas (Waheed et al., 2011; Wang et al., 2023).

The use of AGPs is not merely theoretical but also holds profound implications for practice, policy, and future research in the realm of progressive education in Qatar. By identifying the key factors contributing to the success of progressive education

practices in HEIs, AGPs can inform the development of effective policies and strategies that support student-centred learning and critical thinking skills (Marchionini, 2019) in Qatar, and contribute to existing knowledge on personas (Adlin et al., 2006; Adlin & Pruitt, 2010; Grudin, 2006; Pruitt & Adlin 2010). AGPs become highly relevant to the critical problems these institutions face, such as low student engagement (Ali Amer Jid Almahri et al., 2019). Through the creation of different personas of these students (Nielsen, 2013a, 2013b; Nielsen et al., 2015), our findings provide insights into how to improve students' engagement levels, ultimately affecting their performance, and reducing drop-out rates (Finn & Zimmer, 2012; Groccia, 2018; Parsons & Taylor, 2011; Trowler, 2010). Moreover, by focusing on alumni experiences (i.e., beyond education), AGPs offer a suitable lens to enable understanding of the impact of progressive education practices on postgraduate success rates, and engagement with higher education entities, while considering local cultural needs and norms.

## 6.2 Background

In the rapidly evolving higher education landscape, fostering ASAFS stakeholder success and engagement remains a paramount challenge for HEIs in Qatar and elsewhere. New technologies such as genomics and AI are now enabling HEIs to provide much enhanced diagnostics and, thus, personalised interventions that are more appropriate and effective. The emergence of student-centred approaches has shifted the focus from a one-size-fits-all educational model towards a dynamic **personalised learning experience** (Bhutoria, 2022; Patrick et al., 2013; Yang et al., 2019). This approach tailors educational experiences to students' needs, interests, and learning styles, to optimise their engagement and understanding. Within this transformative landscape, one innovative strategy is proposed: the use of AGPs. While personas are a well-established design thinking tool in marketing and user experience (UX) research, the application of personas in higher education is limited. Understanding the implications of employing such tools becomes imperative, as they have the potential to enhance student-centric approaches, ultimately leading to improved learning outcomes and overall ASAFS stakeholder satisfaction. By understanding the diverse needs, preferences, and motivations of their ASAFS stakeholders, especially students, institutions can tailor curricula, support services, and campus experiences, to cater to individual learning styles, thus nurturing a more inclusive learning environment, conducive to success.

Existing theories and models have been developed to describe the stages of student development (Patton et al., 2016) during their college years (Evans et al., 2010; Kegan, 1998). We draw upon two prominent theories in this regard, mainly Perry's intellectual and ethical development theory and Kegan's theory of self-evolution.

These theories offer invaluable insights into how college students perceive knowledge, values, and authority, and how they develop cognitive complexity and self-regulation. Perry's intellectual and ethical development theory is widely recognised and influential in understanding student development. According to Perry, college students progress through four stages (i.e., dualism, multiplicity, relativism, and commitment) that reflect their evolving perspectives on knowledge, values, and authority (Evans et al., 2010). Initially, students may hold dualistic beliefs, perceiving knowledge as absolute and authority as external. As they advance, they move towards more nuanced views, recognising the complexity and subjectivity of knowledge and developing their ethical frameworks. In turn, Kegan's theory of self-evolution complements Perry's theory by focusing on the cognitive complexity and self-regulation of college students (Kegan, 1998). Kegan proposes that students transition from a socialised mind, where they rely heavily on external validation and conform to societal expectations, to a self-authoring mind. In the self-authoring stage, students develop a more autonomous sense of self, taking responsibility for their beliefs, values, and actions.

HEIs worldwide have witnessed a transformation in their pedagogical practices, driven by the realisation that learners are not homogenous entities, but individuals with unique backgrounds, goals, and learning preferences (Garces-Bacsal et al., 2021; Gu & Lee, 2019; Hamdan Alghamdi, 2014). During the recent COVID-19 pandemic, new bewildering challenges related to learning and engagement emerged (Laato et al., 2022). As colleges and universities strive to create enriching educational experiences for their diverse stakeholder populations, the integration of personas as a strategic planning tool is gaining considerable attention. By leveraging personas, educators, and administrators can transcend traditional demographics-based segmentation, and unearth a more profound understanding of their students' needs, habits, and pain points (and those of other stakeholders), paving the way to implementing targeted interventions and personalised support systems. This chapter aims to push forward further the emerging use of personas in higher education, notably within Qatari HEIs, and provide insights into successful implementation strategies across various institutional settings. HEIs can build a strong foundation for elevating student success and enriching the overall academic experience, by harnessing personas to embrace stakeholder diversity. For example, personas help HEIs understand students' different cultural perspectives, languages, and learning preferences, allowing them to create a more inclusive and culturally sensitive learning environment.

By developing AGPs representing different ASAFS groups, Qatar's education systems can tailor educational programmes to meet each group's specific needs and goals. This personalisation can lead to more effective learning outcomes and increased stakeholder engagement. Personas can inform many aspects of the progressive education process, such as integrating technology into classrooms, and ensuring that digital tools and platforms align with students' and teachers' technological skills and preferences. By understanding the multifaceted needs and aspirations of students, teachers, and communities, Qatar can strengthen its education sector, and progress towards its long-term development objectives.

### 6.3 Defining Personas

Personas are fictional characters created often through a data-driven synthesis of qualitative and quantitative student information, representing specific student archetypes that share common characteristics, behaviours, and aspirations. These personas are ideally based on real data and research, such as surveys, interviews, and observations, to accurately reflect the targeted stakeholder group's characteristics, behaviours, and needs. As a humanised representation of the data, personas are an empathetic approach to representing segments of the target populations by presenting this data in the form that most people can relate to—another person (Jansen et al., 2020). Personas are widely developed in many domains and organisations, using various methods, including qualitative and algorithmic approaches (Volden & Wattne, 2023). Personas have been evaluated in multiple manners, including statistic evaluation for segmentation identification tasks (Salminen et al., 2020a), with various positive benefits reported in the literature (Hemzo, 2023). A persona is typically presented in a one- to two-page document called a persona profile (Pruitt & Grudin, 2003); however, personas can also be presented algorithmically in data-driven ML or AI systems (Jiang et al., 2020). Personas are used for various tasks within teams and organisations, including stakeholder communication, planning, and objective setting (Pruitt & Adlin 2010).

### 6.4 Defining Progressive Education

The term progressive education encompasses a broad range of ideas and reforms (Davies, 2002), and encompasses a range of teaching and educational approaches. Due to its vast and sometimes vague generalities (McNear, 1978), it becomes difficult to construe the precise meaning. For this reason, our focus is on progressive pedagogy and practices.

Progressive education pedagogy includes several related concepts that promote effective learning and teaching: *Action Learning* (a professional development approach that involves learning through real-world projects and reflective group discussions), *Authentic Learning* (a teaching and learning approach that integrates real-world experiences and tasks, to develop practical skills and meaningful understanding), *Interdisciplinarity* (the integration and collaboration of knowledge and methodologies from different academic disciplines, to address complex issues and challenges), *Project-based Learning* (an instructional approach where students learn by actively engaging in projects that foster critical thinking, problem-solving, and practical application of knowledge), *Reflective Learning* (a process of self-examination and thoughtful consideration of experiences, enabling the development of insights and personal growth), *Self-regulated Learning* (the ability of individuals to independently manage their own learning process, including setting goals, monitoring progress, and adapting strategies, to achieve optimal learning outcomes),

*Flipped Learning* (an educational approach where traditional in-class lectures are replaced with independent learning activities at home, while interactive discussions and problem-solving take place during class time), and many more (Tippett & Lee, 2019). Most of these progressive pedagogies are visible in HEI practices nowadays. For example, service learning is a progressive pedagogy visible in the HEI's co- and extra-curriculum. For this chapter, we will consider practices of progressive pedagogy as progressive education. These practices are fully or partially part of the Qatari HEIs.

## 6.5 The Use of Personas in Education

Using personas in education involves creating fictional representations of people who belong to specific groups within the educational context. These personas help educators, administrators, and other stakeholders to better understand and address the diverse needs and preferences of students, teachers, parents, and other educational community members. There are several benefits to creating ASAFS personas in education. First, creating personas of ASAFS groups helps provide a richer account to stakeholders. This, in turn, allows designers and developers to maintain a student-centric approach during the technology design process (Greer et al., 2015). Second, creating personas helps facilitate an understanding of the HEI context of ASAFS groups, and supports the design and development of learning tools (Lilley et al., 2012). Third, creating student personas makes personal information about ASAFS groups more accessible (Sun & Rosson, 2017). Fourth, creating personas helps better represent the ASAFS groups' profiles, and expresses students' goals, needs, learning objectives, behaviours, and challenges (Dittmar & Forbrig, 2019). Fifth, the ASAFS groups' personas could reveal similarities and differences between students (Sim et al., 2019). Sixth, creating ASAFS personas fosters a shared understanding of the stakeholder group around which the design process is built. This can help prioritise design considerations, for example, in the context of student learning (Peters et al., 2021). Seventh, creating ASAFS personas cultivates empathy, facilitating an understanding of user expectations, goals, needs, experiences, and behaviours (Ekşioğlu et al., 2018). Eighth, ASAFS personas could enable the addressing of issues for individuals with learning difficulties or other disparities, drawing attention to special learning needs.

In summary, ASAFS personas are indispensable assets within education. They enable educators and administrators to understand better their target stakeholders, design more effective and personalised learning experiences, foster inclusive practices, and make informed decisions to enhance the overall educational journey for all stakeholders involved. ASAFS personas are powerful educational tools that promote personalised learning experiences, improve curriculum design, target marketing efforts, and foster empathy and inclusion. By using AGPs personas, academic institutions can better cater to their students' and staff's diverse needs and preferences, ultimately leading to more effective and successful learning outcomes.

## 6.6 Educational Ecosystem—Qatar. The Country's Background

Qatar, officially known as the State of Qatar, is a small, prosperous country on the northeastern coast of the Arabian Peninsula in Western Asia, specifically the Middle East and North Africa (MENA) region (Zahlan, 2016). Qatar is also a member of the Gulf Cooperation Council (GCCs). It shares its only land border with Saudi Arabia to the south, while the Persian Gulf surrounds it on the remaining sides. The capital city is Doha, the country's largest city and economic hub. As of 2023, Qatar's population was around 2.8 million. Most of the population comprises expatriates, with a relatively small percentage of Qatari citizens. Arabic is the official language of Qatar, but English is widely spoken, and used for business and communication. Qatar has a hot desert climate, with scorching summers, and temperatures often exceeding 40 °C (104°F), and mild winters, with temperatures ranging from 15 °C to 25 °C (59°F to 77°F) (Asia & Lanka, 2023).

Qatar has garnered international attention (Peterson, 2006), notably through its ambitious sports initiatives (Matzarakis & Fröhlich, 2015). It hosted the FIFA World Cup in 2022, making it the first MENA country to do so. The FIFA World Cup 2022 event has driven significant infrastructure development and investment in the country. Qatar boasts one of the world's highest Gross Domestic Product (GDP) figures per capita, primarily attributed to its vast natural gas and oil reserves. The country has established itself as one of the leading exporters of liquefied natural gas, and plays a significant role in the global energy market. Additionally, the government has been actively diversifying its economy into finance, tourism, real estate, and the sports sector. Qatar has also been promoting itself as a tourist destination, attracting visitors with its modern architecture, cultural heritage, desert landscapes, and luxury shopping experiences (Asia & Lanka, 2023).

Qatar is an absolute monarchy, with the ruling Al Thani family having held power since the mid-1800s. The country's political system is centred around the Emir, who wields executive authority, appoints ministers, and governs the nation. Qatar's culture is deeply rooted in its Bedouin heritage and Islamic traditions. The country places high importance on preserving its cultural identity, while embracing modernity. Qatar has seen significant development and transformation in recent decades, and plays a prominent role in the Gulf region and the global economy (Asia & Lanka, 2023).

## 6.7 Emphasis on Education

Qatar's education system has undergone significant development and improvement (Ibnouf et al., 2013). The country has prioritised education, ambitiously aiming to transform it to align with its National Vision 2030. Qatar has consistently invested in its education sector, dedicating significant financial resources to enhance infrastructure, educational facilities, and access to quality education for all citizens (Ben



Hassen, 2021). Qatar has achieved near-universal access to primary and secondary education, ensuring that most of its population can receive a basic education. The country has seen an increasing number of internationally recognised universities and educational institutions setting up campuses in Qatar. These partnerships enhance the quality of the country's higher education and research opportunities. It has been implementing comprehensive education reforms to improve the quality of teaching and learning, including updating curricula, incorporating technology into classrooms, and promoting innovative teaching methods (Berrebi et al., 2009).

Qatar has strategically invested in research and innovation, to position itself as a regional knowledge hub (Knight, 2017). This focus on research contributes to advancements in various fields, and fosters a culture of continuous learning. Given its multicultural population, Qatar places importance on multilingual education. English and Arabic are the primary languages of instruction, with efforts to promote bilingualism among students. The country has been actively working towards empowering women in education and promoting gender equality through measures such as increasing access to education and opportunities for women and girls (Coleman, 2004; Inglehart & Norris, 2003; Mitchell et al., 2015). Qatar attracts a growing number of international students due to the reputation of its educational institutions, and the diverse learning environment it offers.

In alignment with its 2030 Qatar National Vision (QNV), Qatar has placed a strong emphasis on education, recognising its role in nurturing human capital, innovation, and economic diversification. It has invested heavily in building world-class educational institutions and facilities and has made significant strides in developing its higher education sector, transforming it into a hub of academic excellence in the MENA (Knight, 2017). Notably, Qatar boasts many prominent higher education entities that play a crucial role in shaping the Gulf's educational landscape. Its commitment to investing in higher education entities has significantly improved the country's educational landscape. The nation continues to attract top-tier faculty and students, while fostering an environment conducive to research, innovation, and academic excellence. As Qatar looks to diversify its economy and develop a knowledge-based society, higher education remains a central pillar in achieving these ambitious goals.

As of 2020, there were a total of 32 HEIs in Qatar that are recognised by the Ministry of Education and Higher Education in Qatar. Of these, ten are public, six are military, eight are QF-affiliated Universities, and nine are privates, offering over 366 educational programmes catering to a broad spectrum of academic interests. Over 41,000 students from more than 100 nationalities were registered in these HEIs in the 2020–2021 academic year.<sup>1</sup>

One of the most notable institutions in Qatar is Qatar University, which was established in 1973, and remains the country's oldest and largest public university. It offers undergraduate and graduate programmes spanning various disciplines,

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<sup>1</sup> Qatar Planning and Statistics Authority. (2021). Education Statistics Chapter 4 - 2020. [https://www.psa.gov.qa/en/statistics/Statistical%20Releases/Social/Education/2021/Education\\_Chapter\\_4\\_2021\\_AE.xlsx](https://www.psa.gov.qa/en/statistics/Statistical%20Releases/Social/Education/2021/Education_Chapter_4_2021_AE.xlsx)

including engineering, business, social sciences, and the humanities. Qatar University has been instrumental in producing skilled graduates and nurturing research initiatives, contributing to the nation's development.

Moreover, the Qatar Foundation (QF) is at the forefront of shaping the country's Education, Science, Community Development, and stimulating research (Rostron, 2009). It has established partnerships with leading international universities, creating branch campuses of reputable institutions within QF's Education City (Walsh, 2019). These branch campuses provide world-class educational opportunities to Qatari students, and attract learners from across the globe, further enhancing the country's position as an education destination. Other notable institutions of QF include Hamad Bin Khalifa University (HBKU), now over ten years old, which focuses on responding to the country's research and workforce requirements (Eggeling, 2020). HBKU primarily provides postgraduate programmes with a major emphasis on research and innovation. In addition, its research institutes and colleges have significant research programmes, aligned with Qatar's 2030 Strategic Vision. In addition, various research centres within QF's Education City conduct pioneering research and innovation. Initiatives like these enhance the education ecosystem, and enrich students' learning experiences, providing them with cutting-edge opportunities, and exposure to groundbreaking advancements.

## 6.8 Using AGPs in Qatari HEIs

The joint sponsors of QF and HBKU funded a pilot project to act as a prototype for the initial premises, and the methodologies were refined in a Facebook Research grant for creating personas for privacy. According to the QF Strategy Plan, Progressive Education is defined as *"Innovatively re-imagining and transforming education to unlock the potential of learners and prepare them for the world of tomorrow by encouraging creativity and student agency."* This is further highlighted in QF's Higher Education vision: *"Our aspiration is to build the future of Qatar by nurturing capable, well-rounded and value-driven human beings, who are committed to leading and shaping their communities. We provide them with world-class, personalized, relevant learning in an inclusive, innovative ecosystem."* AGPs support this goal, and progress in progressive education will enable Qatari HEIs to achieve their strategic objectives<sup>2</sup> and progressive education aims (Howlett, 2013; Reese, 2001; Ylimaki, 2011).

QF's Education City (EC) (Asquith, 2006; Ibnouf et al., 2013; Khodr, 2011; Weber & City, 2012) offers a wealth of information that can generate rich data sets which can be leveraged in creating AGPs with a significant impact. The student population is remarkably diverse, comprising more than 100 nationalities, reflecting the substantial expat community and international non-residential students. Furthermore, the convergence of student communities from eight universities hosted in

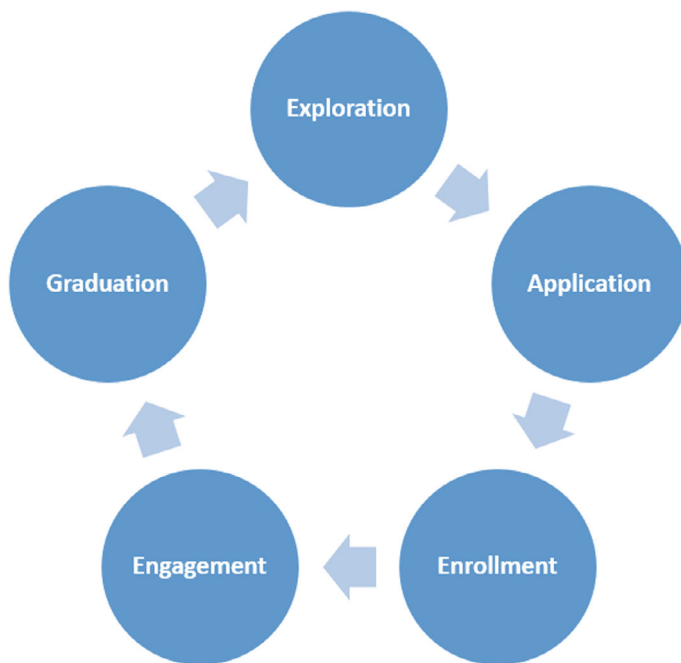
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<sup>2</sup> Cultivating Multiversity Qatar Foundation Strategy Refresh 2022-2032.

EC, pursuing different programmes yet using shared facilities such as the National Library, housing, or attending similar extra-curricular activities, can provide valuable insights into areas of interest, such as student engagement and motivation. In addition, cross-registration (i.e., a system allowing students at one university to take individual courses for credit at another institution), as well as the presence of non-academic centres, formulate unique learner experiences and create individualised student pathways, enriching the data pool that can be utilised in creating AGPs to further support decision-making. The process of leveraging in EC can then be extended to other Qatari HEIs.

Understanding student development theories provides invaluable insights for educators and policymakers into students' learning and growth processes (Marchionini, 2010, 2019). These theories provide frameworks for comprehending the students' diverse perspectives, needs, and challenges through their educational journey. Educators can leverage this knowledge to tailor their teaching approaches, curriculum design, and support systems, so as to meet student development needs. For example, Perry's theory informs curricula design and instructional strategies that promote intellectual growth and ethical reasoning. By recognising students' positions, educators can engage them in meaningful discussions, challenge their assumptions, and foster critical thinking skills. Embedding AGPs (Spiliotopoulos et al., 2020) can enhance our understanding of the complexities we face in our education systems (Ozkan et al., 2019). However, modern education approaches have yet to address the needs of the current or future workforce with diverse demographic, behavioural, experiential, and social profiles (Toldson, 2021) in different journey phases. Our method takes a novel approach by proposing a progressive education journey (see Fig. 6.1) modelled on extensive business and marketing literature research (Jansen & Schuster, 2011; Lemon & Verhoef, 2016; Tueanrat et al., 2021) applied to HEIs. The rationale behind using business and marketing literature to model the cycle of lifelong learning arises from the rationale that terminologies such as the personalisation of education are based on marketing theory and are now an emerging "movement" within the field of education. Our education cycle modifies the customer's journey phases to resemble that shown in Fig. 6.2, with stakeholders at and within each stage having unique goals and needs to be represented by personas.

- **Exploration.** Prospective students seek information about colleges and programmes to achieve their educational goals. HEIs can raise students' awareness and interest in their offerings and values.
- **Application.** Prospective students decide to apply and submit the required documents and fees, and HEIs can streamline the application process and provide clear communication and timely feedback.
- **Enrolment.** Prospective students accept admission offers and complete the necessary steps like enrolment, payment of tuition, and course registration. HEIs guide for a smooth transition.
- **Engagement.** Enrolled students participate in various academic and co-curricular activities and experiences, gaining knowledge, skills, and competencies. HEIs

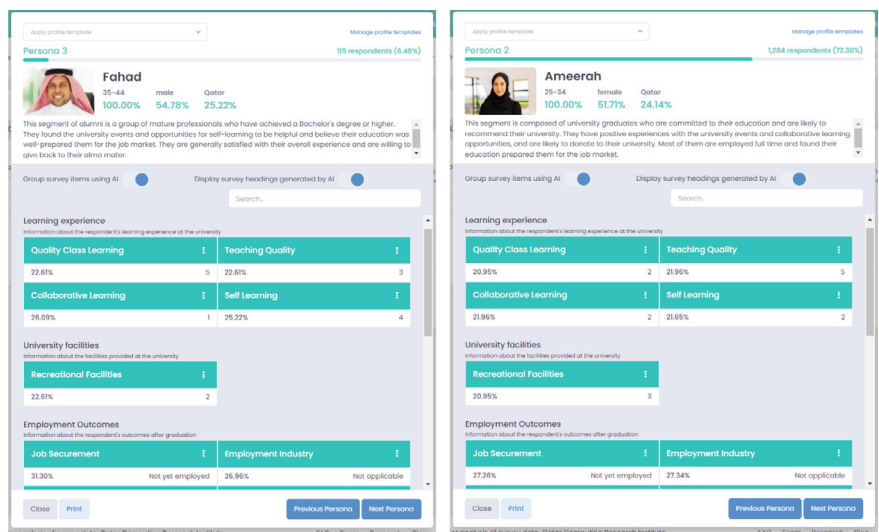


**Fig. 6.2** Theoretical model of education cycle presented as a five-stage continuous cycle of lifelong learning

help to foster a sense of belonging and community among students, and provide learning and development opportunities.

- **Graduation.** Students complete their degree requirements, celebrate their academic achievement, and become alumni, joining a network of graduates. HEIs help recognise their accomplishments, and maintain a lifelong relationship with them.

Using AGPs in progressive education can provide valuable insights into the needs and expectations of ASAFS stakeholders. Personas (Nielsen, 2011, 2013a, 2013b; Nielsen & Storgaard Hansen, 2014) are *humanised representations of data in an easily digestible form*. By developing these personas (Grudin, 2006), Qatar's progressive educational HEIs can better understand their stakeholders' diverse needs and preferences, and tailor programmes and services to meet them (Jansen et al., 2021a, 2021b; Salminen et al., 2020b; Salminen, Guan, et al., 2021a, 2021b; Salminen, Jung, et al., 2021a, 2021b; Salminen, Nielsen, et al., 2022a, 2022b). Personas can also help HEIs in Qatar to develop targeted recruitment and retention strategies. For example, personas can shed light on the factors influencing prospective students' decisions to apply and enrol in a programme, and the barriers that may prevent them from doing so. This information can enhance marketing campaigns and support services for different student populations.



**Fig. 6.3** Two AGPs from Survey2Persona of Qatari HEIs Alumni. The names and images are auto-loaded from meta-tagged data. The descriptions are created from Generative AI using survey responses. The survey questions are also grouped and labelled using AI

Similarly, personas can yield insights into the factors that influence alumni engagement, such as the types of activities and events that alumni find most meaningful and the barriers that may prevent them from staying connected with the institution. At the graduation stage, these AGPs extend to the alumni of the progressive education cycle and the related stakeholders. This information can be used to design KPIs for more effective alumni engagement strategies that foster long-term relationships and support the Qatari HEIs institutional goals. Figure 6.3 below illustrates two personas that can be created to assist Qatari HEI decision-makers.

Overall, using AGPs can aid HEIs within Qatar, in promoting more inclusive and equitable educational experiences in progressive education. By understanding different stakeholders’ goals, motivations, and behaviours, Qatar HEIs can design or refine more targeted KPIs, programmes, and services that satisfy their specific requirements and preferences, including addressing local cultural needs (Akinci, 2020; Hopkyns, 2020; Ruipérez-Valiente et al., 2020).

### 6.9 Discussion

The use of AGPs by Qatari HEIs represents a novel, original, creative, and potentially transformative approach in several profound ways.

First, AGPs positively impact progressive education, a contemporary pedagogical movement aiming to educate the whole learner, and foster critical thinking, problem-solving, social skills, and social values.

Second, AGPs employ various data sources and methods to capture key stakeholders' cognitive, affective, sensory, and behavioural attributes of the progressive education cycle stages at HEIs. This comprehensive and holistic approach transcends traditional academic performance and satisfaction measures, and it will provide deeper insights into the effectiveness of progressive education, ultimately positively affecting the designing and shaping of educational practices of HEIs in Qatar.

Third, AGPs have the power to represent the diverse and complex attributes of HEI stakeholders in Qatar, culminating in helping HEIs create and evaluate personalised policies and KPIs for progressive education. Specifically, this method informs policies and strategies supporting student-centred learning, and promotes ASAFS success, by understanding the diverse characteristics, preferences, and learning styles that shape their unique personas. By mapping these personas to specific educational contexts, such as subject matter, instructional methods, and assessment approaches, educators can tailor their teaching strategies to cater to their students' needs and learning preferences.

Fourth, the use of AGPs builds on the existing literature and theories of progressive education, persona generation, and human–AI interaction (An et al., 2018; Jansen et al., 2021a, 2021b; Salminen, Guan, et al., 2021a, 2021b; Salminen, Jung, et al., 2022a, 2022b) but also contributes fresh insights and frameworks that can advance the fields of education, computer science, and psychology. This research can potentially transform how HEIs in Qatar design and implement educational programmes to enhance stakeholder learning outcomes and overall well-being.

### 6.9.1 *Implications*

This chapter proposes and endorses an exciting opportunity to advance the field of persona usage in progressive education, by applying AI and ML techniques to generate personas of ASAFS stakeholders at HEIs in Qatar. AGPs can address stakeholders' dynamic and diverse needs, enriching policymakers with a holistic understanding of the key players' preferences in various stages of the progressive education cycle within HEIs in Qatar. This understanding empowers policymakers to set and evaluate KPIs that align with the stakeholders' needs (Chandran et al., 2023). AGPs also set several expected scientific outcomes, contributing to theory and practice by improving educational quality and designing effective policies using AGPs. These implications of using AGPs are listed below in the Expected Outcomes (EO):

- **EO1:** A comprehensive and holistic understanding of the diverse and complex stakeholders' attributes in the progressive education cycle stages at HEIs in Qatar.
- **EO2:** AGPs representing realistic HEI stakeholders in Qatar, using state-of-the-art AI and ML techniques in an HCI, human-centred representation.

- **EO3:** Insights into how AGPs of critical stakeholders can inform and design policies, pedagogy, assessment practices, and user-centric curricula for progressive education at HEIs in Qatar.
- **EO4:** A significant contribution to the theory and practice of progressive education, providing evidence-based and user-centred tools and methods for improving the quality and impact of education for learners, educators, administrators, and policymakers.

This call to action for using AGPs aligns with Qatar's vision of empowering the next generation of scientists, by providing them with progressive education for their physical, emotional, and intellectual growth, through its Research, Development and Innovation (RDI) ecosystem<sup>3</sup>. The ASAFS stakeholders are crucial to Qatari HEIs regarding financial support, recruiting, and classroom engagement. The RDI ecosystem aims to enhance Qatar's ability to address challenges and seize opportunities with innovative and progressive solutions based on innovative research and development. Developing AGPs of the stakeholders of HEIs in Qatar will significantly contribute to Qatar's RDI ecosystem by:

- **RDIC1:** Identifying the gaps in the education system and the ASAFS stakeholders' perspectives, enabling the development of personalised strategies to address these challenges.
- **RDIC2:** Providing a user-centred perspective that guides the design and development of RDI solutions, to address the needs and challenges of different sectors and domains with HEIs.
- **RDIC3:** Enhancing the communication and collaboration among RDI stakeholders across government, industry, and academia, by creating a common language and understanding of ASAFS user groups by aligning with HEI strategy planning.
- **RDIC4:** Facilitating the evaluation and improvement of RDI outcomes and impacts by measuring feedback and engagement through shared empathic and humanised representation of HEI stakeholders.
- **RDIC5:** Enabling the identification and exploration of new opportunities and markets for HEI products and services that align with the national vision and goals.

AGPs in progressive education at HEIs in Qatar present an unprecedented opportunity to understand key ASAFS stakeholders' needs, enabling evidence-based strategies for designing user-centric policies and practices. By aligning with the national priority to develop, adapt, and deploy new digital technologies to increase the growth and competitiveness of Qatar's vital economic sectors, this research presents practical solutions to national challenges.

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<sup>3</sup> <https://qrqi.org.qa/>

### 6.9.2 Policy Implications

Some critical policy implications for the use of AGPs by HEIs are:

- **Embrace Data-Driven Approaches:** HEIs in Qatar should formally integrate AGPs into their institutional policy framework. These personas can provide insights into various stakeholders' needs and behaviours, and they can become an essential tool in the strategic planning and decision-making processes, ensuring that policies are aligned with the actual needs of the ASAFS community.
- **Strengthening Alumni Engagement:** Given the emphasised role of alumni in the abstract, HEIs should create policies that bolster alumni engagement. This could involve creating alumni-centric platforms or programmes that enable continuous feedback, or setting up dedicated alumni relations departments, to maintain close ties and facilitate a “beyond education” experience.
- **Investment in Technology and Training:** Recognising the importance of AGPs suggests a need for policies prioritising investments in technology (e.g., ML and LLMs) and the training required for staff to utilise and interpret AGP insights effectively. Ensuring that personnel can harness the full potential of these tools will be crucial for their effective implementation.
- **Inclusive and Learner-Centred Curriculum Design:** As AGPs can aid in understanding the needs and challenges faced by various stakeholders, HEIs should adopt policies that encourage a curriculum design process that is more inclusive and learner-centred. This could involve regularly reviewing and updating the curriculum based on AGP insights and ensuring diverse stakeholder representation in curriculum development committees.
- **Expanding Research and Development in AGPs:** Recognising the unexplored potential of AGPs in higher education, HEIs should consider implementing policies that encourage research and development in this area. This could involve setting up dedicated research centres or funding initiatives, fostering collaborations with technology and data science departments, or encouraging interdisciplinary research that bridges the gap between pedagogy and technology.

Incorporating these policy implications would assist HEIs in Qatar in staying ahead of the curve, ensuring that they remain responsive to stakeholder needs, and provide a progressive, inclusive, forward-thinking education experience.

### 6.9.3 Conclusion

Using personas, specifically AGPs, in education, offers a powerful and transformative approach to addressing the diverse and evolving needs of learners, educators, and communities in Qatar's HEIs. By creating these fictional representations of various user groups, educational stakeholders can gain invaluable insights, fostering empathy, personalisation, and inclusivity within the education system.



The implications of utilising personas in Qatar's education sector are profound and far-reaching. By embracing this approach, Qatari educational institutions can proactively respond to their diverse student body's unique cultural, linguistic, and learning preferences, ensuring an inclusive and supportive learning environment for all. Customised educational programmes, tailored to the needs and goals of specific personas, will lead to more engaged and successful students.

Moreover, the integration of personas can guide the strategic use of educational technology, aligning it with students' and educators' technological literacy and preferences. This harmonious blending of traditional pedagogies and innovative digital tools will foster a future-ready generation prepared to navigate Qatar's technology-driven landscape.

As Qatar aspires to evolve into a knowledge-based economy and achieve its ambitious National Vision 2030, the role of personas in education becomes even more critical. By investing in continuing education and professional development, customised to meet the aspirations of educators and their personas, the nation can cultivate a proficient and empowered teaching workforce.

The implications of using personas in education extend beyond the classroom, fostering stronger connections with parents and communities. By understanding and addressing their expectations, the education system can build robust partnerships, fostering a collective commitment to the success of Qatar's students.

In conclusion, integrating personas in the education workflows of HEIs offers Qatar a roadmap to a more inclusive, adaptable, and student-centric education system. By leveraging this powerful tool, Qatar can nurture a diverse and empowered generation equipped with the skills, knowledge, and empathy to thrive in an interconnected global society. As the nation embarks on its journey towards educational excellence, embracing personas will undoubtedly contribute to realising its ambitious aspirations and transforming its education landscape.

## Bibliography

- Adlin, T., Pruitt, J., Goodwin, K., Hynes, C., McGrane, K., Rosenstein, A., & Muller, M. J. (2006). Putting personas to work. *CHI'06 Extended Abstracts on Human Factors in Computing Systems*, 13–16.
- Adlin, T., & Pruitt, J. (2010). *The essential persona lifecycle: Your guide to building and using personas*. Morgan Kaufmann.
- Akinci, I. (2020). Culture in the 'politics of identity': Conceptions of national identity and citizenship among second-generation non-Gulf Arab migrants in Dubai. *Journal of Ethnic and Migration Studies*, 46(11), 2309–2325.
- Ali Amer Jid Almahri, F., Bell, D., & Arzoky, M. (2019). Personas design for conversational systems in education. *Informatics*, 6 (4), 46.
- Alves, H., Mainardes, E. W., & Raposo, M. (2010). A relationship approach to higher education institution stakeholder management. *Tertiary Education and Management*, 16, 159–181.
- An, J., Kwak, H., Jung, S., Salminen, J., Admad, M., & Jansen, B. (2018). Imaginary people representing real numbers: Generating personas from online social media data. *ACM Transactions on the Web (TWEB)*, 12(4), 1–26.

- Asia, S., & Lanka, S. (2023). *The World Fact Book*. Central Intelligence Agency.
- Asquith, C. (2006). Accepted into education city. *Diverse Issues in Higher Education*, 23(8), 22.
- Ben Hassen, T. (2021). The state of the knowledge-based economy in the Arab world: Cases of Qatar and Lebanon. *EuroMed Journal of Business*, 16(2), 129–153.
- Berrebi, C., Martorell, F., & Tanner, J. C. (2009). Qatar's labor markets at a crucial crossroad. *The Middle East Journal*, 63(3), 421–442.
- Bhutoria, A. (2022). Personalized education and artificial intelligence in the United States, China, and India: A systematic review using a human-in-the-loop model. *Computers and Education: Artificial Intelligence*, 3, 100068.
- Chandran, V., Fadia, A., Isherwood, T., Shah, N., & Soni, K. (2023). *The state of AI in GCC countries—and how to overcome adoption challenges* | McKinsey. <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-state-of-ai-in-gcc-countries-and-how-to-overcome-adoption-challenges>
- Coleman, I. (2004). The payoff from women's rights. *Foreign Affairs*, 83, 80.
- Cunningham, D. J. (1992). Beyond educational psychology: Steps toward an educational semiotic. *Educational Psychology Review*, 4, 165–194.
- Davies, S. (2002). The paradox of progressive education: a frame analysis. *Sociology of Education*, 269–286.
- Dittmar, A., & Forbrig, P. (2019). Integrating Personas and Use Case Models. In D. Lamas, F. Loizides, L. Nacke, H. Petrie, M. Winckler, & P. Zaphiris (Eds.), *Human–Computer Interaction—INTERACT 2019* (Vol. 11746, pp. 666–686). Springer International Publishing. [https://doi.org/10.1007/978-3-030-29381-9\\_40](https://doi.org/10.1007/978-3-030-29381-9_40)
- Eggeling, K. A. (2020). Cultural diplomacy in Qatar: between 'virtual enlargement', national identity construction and elite legitimization. In *Cultural Diplomacy and International Cultural Relations: Volume I* (pp. 59–73). Routledge.
- Ekşiöğlu, M., Güler, H., Terzi, F., Yıldırım, H. S., & Yücel, B. (2018). UXD for a prototype campus information Kiosk. In: *proceedings of the 2nd International Conference on Computer-Human Interaction Research and Applications*, 176–182. <https://doi.org/10.5220/0007229801760182>
- Evans, N., Forney, D., Guido, F., Patton, L., & Renn, K. (2010). Perry's theory of intellectual and ethical development. In: *Student Development in College: Theory, Research, and Practice*, 82–98.
- Falqueto, J. M. Z., Hoffmann, V. E., Gomes, R. C., & Onoyama Mori, S. S. (2020). Strategic planning in higher education institutions: What are the stakeholders' roles in the process? *Higher Education*, 79, 1039–1056.
- Ferrero-Ferrero, I., Fernández-Izquierdo, M. Á., Muñoz-Torres, M. J., & Bellés-Colomer, L. (2018). Stakeholder engagement in sustainability reporting in higher education: An analysis of key internal stakeholders' expectations. *International Journal of Sustainability in Higher Education*, 19(2), 313–336.
- Finn, J. D., & Zimmer, K. S. (2012). Student engagement: What is it? Why does it matter? *Handbook of Research on Student Engagement*, 97–131.
- Garces-Bacsal, R. M., Tupas, R., Alhosani, N. M., & Elhoweris, H. (2021). Teachers' perceptions of diversity and 'others' in United Arab Emirates (UAE) Schools. *Pedagogy, Culture & Society*, 1–19. <https://doi.org/10.1080/14681366.2021.2011774>
- Grace, G. R., & Grace, G. (1995). *School leadership: Beyond education management: An essay in policy scholarship*. Psychology Press.
- Greer, J. E., Frost, S., Banow, R., Thompson, C., Kuleza, S., Wilson, K., & Koehn, G. (2015). The student advice recommender agent: SARA. *International Workshop on Personalization Approaches in Learning Environments*.
- Groccia, J. E. (2018). What is student engagement? *New Directions for Teaching and Learning*, 2018(154), 11–20.
- Grudin, J. (2006). *Why Personas Work: the Psychological Evidence. The persona lifecycle: keeping people in mind throughout the product design*. Morgan Kaufmann.

- Gu, M. M., & Lee, J.C.-K. (2019). “They lost internationalization in pursuit of internationalization”: Students’ language practices and identity construction in a cross-disciplinary EMI program in a university in China. *Higher Education*, 78, 389–405.
- Hamdan Alghamdi, A. K. (2014). The road to culturally relevant pedagogy: Expatriate teachers’ pedagogical practices in the cultural context of Saudi Arabian higher education. *McGill Journal of Education*, 49(1), 201–226.
- Hemzo, M. A. (2023). Defining the Persona: Segmentation and Targeting. In *Marketing Luxury Services: Concepts, Strategy, and Practice* (pp. 75–94). Springer.
- Hopkins, S. (2020). *The impact of global English on cultural identities in the United Arab Emirates: Wanted not welcome*. Routledge.
- Howlett, J. (2013). *Progressive education: a critical introduction*. A & C Black.
- Ibnouf, A., Dou, L., & Knight, J. (2013). The evolution of Qatar as an education hub: moving to a knowledge-based economy. In *International education hubs: Student, talent, knowledge-innovation models* (pp. 43–61). Springer.
- Inglehart, R., & Norris, P. (2003). *Rising tide: gender equality and cultural change around the world*. Cambridge University Press. <https://books.google.com/books?hl=en&lr=&id=Gzvt11ztO71C&oi=fnd&pg=PR7&dq=Qatar+has+been+actively+working+towards+empowering+women+in+education+and+promoting+gender+equality+through+measures+such+as+increasing+access+to+education+and+opportunities+for+women+and+girls&ots=oe2KKdSB8M&sig=Jfu8ahe48rgyY7O7oAkUwR9-LF8>
- Jansen, B. J., Jung, S., & Salminen, J. (2021). Making better decisions with big data personas | MIT Technology Review. *MIT Technology Review*. <https://www.technologyreview.com/2021/03/11/1020207/making-better-decisions-with-big-data-personas/>
- Jansen, B. J., Salminen, J. O., & Jung, S. (2020). Data-driven personas for enhanced user understanding: Combining empathy with rationality for better insights to analytics. *Data and Information Management*, 4(1), 1–17. <https://doi.org/10.2478/dim-2020-0005>
- Jansen, B., Salminen, J., Jung, S., & Guan, K. (2021b). Data-driven personas. *Synthesis Lectures on Human-Centered Informatics*, 14(1), i–317.
- Jansen, B. J., & Schuster, S. (2011). Bidding on the buying funnel for sponsored search and keyword advertising. *Journal of Electronic Commerce Research*, 12(1), 1.
- Jiang, B., Zhou, W., Yang, J., Yang, C., Wang, S., Pang, L., Scott, D., Bel, N., & Zong, C. (2020). Pednet: a persona enhanced dual alternating learning network for conversational response generation. *Proceedings of the 28th International Conference on Computational Linguistics*, 4089–4099. <https://doi.org/10.18653/v1/2020.coling-main.361>
- Kegan, R. (1998). *In over our heads: The mental demands of modern life*. Harvard University Press.
- Khodr, H. (2011). The dynamics of international education in Qatar: Exploring the policy drivers behind the development of Education City. *Journal of Emerging Trends in Educational Research and Policy Studies*, 2(6), 514–525.
- Knight, J. (2017). Education hubs: international, regional and local dimensions of scale and scope. In *Space, Place and Scale in the Study of Education* (pp. 118–131). Routledge.
- Laato, S., Farooq, A., Vilppu, H., Airola, A., & Murtonen, M. (2022). Higher education during lockdown: Literature review and implications on technology design. *Education Research International*, 2022, e7201043. <https://doi.org/10.1155/2022/7201043>
- Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *Journal of Marketing*, 80(6), 69–96.
- Levi, M. D., & Marchionini, G. (2019). Fruitful collaborations: integrating research and practice. In *Human-Centered Computing* (pp. 799–803). CRC Press.
- Lilley, M., Pyper, A., & Attwood, S. (2012). Understanding the Student Experience through the Use of Personas. *Innovation in Teaching and Learning in Information and Computer Sciences*, 11 (1), 4–13. <https://doi.org/10.11120/ital.2012.11010004>
- Logermann, F., & Leišytė, L. (2015). Students as Stakeholders in the policy context of the European Standards and Guidelines for Quality Assurance in Higher Education Institutions. *The European Higher Education Area: Between Critical Reflections and Future Policies*, 685–701.

- Marchionini, G. (2010). The many meanings of information. In *Information Concepts: From Books to Cyberspace Identities* (pp. 1–9). Springer.
- Marchionini, G. (2019). Search, sense making and learning: Closing gaps. *Information and Learning Sciences*, 120(1/2), 74–86.
- Matzarakis, A., & Fröhlich, D. (2015). Sport events and climate for visitors—The case of FIFA World Cup in Qatar 2022. *International Journal of Biometeorology*, 59, 481–486.
- McNear, D. B. (1978). A critical examination of definitions for progressive education. *The Clearing House*, 52(1), 37–40.
- Meyerhoff, E. (2019). *Beyond education: Radical studying for another world*. U of Minnesota Press.
- Mitchell, J. S., Paschyn, C., Mir, S., Pike, K., & Kane, T. (2015). In majaalis al-hareem: The complex professional and personal choices of Qatari women. *DIFI Family Research and Proceedings*, 4, 1–12.
- Nielsen, L. (2011). Personas in co-creation and co-design. *Proceedings of the 11th Danish Human-Computer Interaction Research Symposium (DHRS2011)*, 38–40.
- Nielsen, L. (2013b). *Personas—user focused design* (Vol. 1373). Springer.
- Nielsen, L. (2013a). Personas. *The Encyclopedia of Human-Computer Interaction*, 2.
- Nielsen, L., & Storgaard Hansen, K. (2014). Personas is applicable: A study on the use of personas in Denmark. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 1665–1674.
- Nielsen, L., Hansen, K. S., Stage, J., & Billestrup, J. (2015). A template for design personas: Analysis of 47 persona descriptions from Danish industries and organizations. *International Journal of Sociotechnology and Knowledge Development (IJSKD)*, 7(1), 45–61.
- Ozkan, D. S., Reeping, D., McNair, L. D., Martin, T. L., Harrison, S., Lester, L., Knapp, B., Wisnioski, M., Patrick, A., & Baum, L. (2019). Using personas as curricular design tools: Engaging the boundaries of engineering culture. *IEEE Frontiers in Education Conference (FIE)*, 2019, 1–7.
- Park, D., & Kang, J. (2022). Constructing data-driven personas through an analysis of mobile application store data. *Applied Sciences*, 12(6), 2869.
- Parsons, J., & Taylor, L. (2011). Improving student engagement. *Current Issues in Education*, 14 (1).
- Patrick, S., Kennedy, K., & Powell, A. (2013). Mean what you say: defining and integrating personalized, blended and competency education. *International Association for K-12 Online Learning*. <https://eric.ed.gov/?id=ED561301>
- Patton, L. D., Renn, K. A., Guido, F. M., & Quaye, S. J. (2016). *Student development in college: Theory, research, and practice*. John Wiley & Sons.
- Peters, M., Simo, L. P., Amatller, A. M., Linan, L. C., & Kreitz, P. B. (2021). Toward a user-centred design approach for AR technologies in online higher education. In *2021 7th International Conference of the Immersive Learning Research Network (iLRN)*, 1–8. <https://doi.org/10.23919/iLRN52045.2021.9459409>
- Peterson, J. E. (2006). Qatar and the world: branding for a micro-state. *The Middle East Journal*, 732–748.
- Pruitt, J., & Grudin, J. (2003). Personas: practice and theory. *Proceedings of the 2003 Conference on Designing for User Experiences*, 1–15. <https://doi.org/10.1145/997078.997089>
- Pruitt, J., & Adlin, T. (2010). *The persona lifecycle: Keeping people in mind throughout product design*. Elsevier.
- Reese, W. J. (2001). The origins of progressive education. *History of Education Quarterly*, 41(1), 1–24.
- Rostron, M. (2009). Liberal arts education in Qatar: Intercultural perspectives. *Intercultural Education*, 20(3), 219–229.
- Ruipérez-Valiente, J. A., Halawa, S., Slama, R., & Reich, J. (2020). Using multi-platform learning analytics to compare regional and global MOOC learning in the Arab world. *Computers & Education*, 146, 103776.

- Salminen, J., Jung, S., Chowdhury, S., Sengün, S., & Jansen, B. J. (2020b). Personas and analytics: a comparative user study of efficiency and effectiveness for a user identification task. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, 1–13.
- Salminen, J., Jung, S., Chowdhury, S., Sengün, S., & Jansen, B. J. (2020a). Personas and analytics: a comparative user study of efficiency and effectiveness for a user identification task. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, 1–13.
- Salminen, J., Guan, K., Jung, S.-G., & Jansen, B. J. (2021). A survey of 15 years of data-driven persona development. *International Journal of Human–Computer Interaction*, 37(18), 1685–1708.
- Salminen, J., Jung, S.-G., & Jansen, B. (2022). Developing persona analytics towards persona science. In *27th International Conference on Intelligent User Interfaces*, 323–344.
- Salminen, J., Nielsen, L., Bahloul, M., Jørgensen, R. G., Santos, J. M., Jung, S.-G., & Jansen, B. J. (2022). Persona preparedness: a survey instrument for measuring the organizational readiness for deploying personas. *Information Technology and Management*, 1–26.
- Salminen, J., Jung, S.-G., Chowdhury, S., Robillos, D. R., & Jansen, B. (2021b). The ability of personas: An empirical evaluation of altering incorrect preconceptions about users. *International Journal of Human–Computer Studies*, 153, 102645.
- Sim, G., Shrivastava, A., Horton, M., Agarwal, S., Haasini, P. S., Kondeti, C. S., & McKnight, L. (2019). Child-Generated Personas to Aid Design Across Cultures. In D. Lamas, F. Loizides, L. Nacke, H. Petrie, M. Winckler, & P. Zaphiris (Eds.), *Human–Computer Interaction—INTERACT 2019* (Vol. 11748, pp. 112–131). Springer International Publishing. [https://doi.org/10.1007/978-3-030-29387-1\\_7](https://doi.org/10.1007/978-3-030-29387-1_7)
- Spiliotopoulos, D., Margaritis, D., & Vassilakis, C. (2020). Data-assisted persona construction using social media data. *Big Data and Cognitive Computing*, 4(3), 21.
- Sun, N., & Rosson, M. B. (2017). Connection Enablers in Online Learning Community: from Informative Online Personae to Meaningful Social Space. In *Companion of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing*, 315–318. <https://doi.org/10.1145/3022198.3026348>
- Tippett, T. P., & Lee, J. J. (2019). Looking back to move forward: understanding progressive education in the 21st century. *Journal of Applied Learning in Higher Education*, 8, 79–98.
- Toldson, I. (2021). *The Post-Reform Education Era: Mitigating Institutional Racism in Education at the Human-Technology Frontier*. The QEM Network, Washington, D.C. <https://qem.org/events/mitigating-institutional-racism-in-education-at-the-human-technology-frontier/>
- Trowler, V. (2010). Student engagement literature review. *The Higher Education Academy*, 11(1), 1–15.
- Tueanrat, Y., Papagiannidis, S., & Alamanos, E. (2021). Going on a journey: A review of the customer journey literature. *Journal of Business Research*, 125, 336–353.
- Volden, F., & Wattne, O. E. (2023). Wayfinding and navigation in the outdoors: quantitative and data driven development of personas and requirements for wayfinding in nature. In *International Conference on Human–Computer Interaction*, 199–210.
- Waheed, B., Khan, F. I., & Veitch, B. (2011). Developing a quantitative tool for sustainability assessment of HEIs. In *International Journal of Sustainability in Higher Education*.
- Walsh, P. (2019). Establishment of an American Branch-campus model of higher education: Qatar's early goals, rationales, and challenges. *Athens Journal of Education*, 64(4), 271–289.
- Wang, K., Li, B., Tian, T., Zakuan, N., & Rani, P. (2023). Evaluate the drivers for digital transformation in higher education institutions in the era of industry 4.0 based on decision-making method. *Journal of Innovation & Knowledge*, 8 (3), 100364.
- Weber, A. S., & City, E. (2012). Inclusive education in the gulf cooperation council. *Journal of Educational and Instructional Studies in the World*, 2(2), 85–97.
- Yang, S., Tian, H., Sun, L., & Yu, X. (2019). From one-size-fits-all teaching to adaptive learning: the crisis and solution of education in the era of AI. *Journal of Physics: Conference Series*, 1237 (4), 042039. <https://iopscience.iop.org/article/https://doi.org/10.1088/1742-6596/1237/4/042039/meta>

- Ylimaki, R. M. (2011). *Critical curriculum leadership: A framework for progressive education*. Routledge.
- Zahlan, R. S. (2016). *The creation of Qatar*. Routledge.

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