Future-shaping themes: digital age foresight in Turkish university strategic plans

Oğuzhan Aytar
Karamanaoglu Mehmetbey University, Faculty of Economics and Administrative Sciences, Karaman, Turkey
https://orcid.org/0000-0003-3799-0952

Rukiye Arslan
Karamanaoglu Mehmetbey University, Institute of Social Sciences, Karaman, Turkey
https://orcid.org/0000-0002-1681-3394

Abstract
Background: Universities affect their communities and ecosystems both directly and indirectly. The strategic plans of all Turkish universities with Higher Education Council accreditation were thoroughly examined within this context. An ecosystem where digital technologies are used more efficiently and extensively is necessary for the ideal of a more sustainable environment and a world with happy people.
Purpose: This study's main aim was to discover how universities in Türkiye predict the digital age via the emphasis they place on digital themes in their future plans.
Study design/methodology/approach: The content analysis technique utilised within the scope of document analysis was chosen as the best method to satisfy this study's objectives.
Findings/conclusions: The study found five main themes regarding the future of higher education based on codes obtained from university strategic plans. Digital transformation, digital campus, digital education, digital infrastructure, and future-focused units were these themes. We analysed the content of these five areas in connection with four types of universities around the country to see if there was a significant difference in attitude towards the digital age. Only future-focused units significantly distinguished these four types of universities, it was found.
Limitations/future research: The research primarily examined the digital age themes that are evident in the strategic plans of universities. Academic studies for future research may involve an examination of the content of strategic plans in relation with different themes and categorizations. The collected results might be subjected to comparisons in order to assess the effectiveness of strategic plans.

Keywords
strategic plans, universities, digital age, digital transformation, content analysis

Introduction

Companies, public institutions, health institutions, and universities must reorganise and take positions in response to the world's global technological transformation (Fukuda, 2020). Higher education institutions have repositioned themselves and reconsidered their goals in light of the notion that the only way to survive is to acquire the capacity for environmental adaptation (Abad-Segura, González-Zamar, Infante-Moro & Ruipérez García, 2020; Murphy & Costa, 2019). During this time, universities, academics, and students are contemplating how to make better use of the opportunities they have (Taşkıran, 2017). In accordance with the expectations and needs of stakeholders, they are attempting to create a digital ecosystem and develop a variety of solutions in this context by employing technological approaches rather than conventional ones (Aavik, 2019;

Sandkuhl & Lehmann, 2017). Future higher education will require more than the implementation of the current trend of digitising academic materials. In addition, it is crucial to establish a technological infrastructure capable of meeting future demands.

There are direct and indirect effects of universities on the communities and environments in which they are situated. They have a tremendous capacity to contribute to the cultural, scientific, and economic growth of the societies in which they operate (Hanssen & Solvoll, 2015; Schoellman & Smirnyagin, 2021; Taebi, Hoven & Bird, 2019). It has been noted that countries with the most successful universities in the world also enjoy social and economic prosperity (Lukovics & Zuti, 2017). The ecosystem of higher education is evolving and changing. In light of recent advancements in sectors such as computing, networking, artificial intelligence, and virtual realities, educational technologies continue to evolve and advance at a rapid rate (Bonfield, Salter, Longmuir, Benson & Adachi, 2020; Cheung, Kwok, Phusavat & Yang, 2021).

The variables that cause change in higher education can be categorised into three broad groups: global, national, and institutional (Odabaşı, 2006). The diffusion and utilisation effect of technology places global norms and practises on the agenda and further accelerates the shift. The growing potential of internet technology in particular offers new aspects to educational processes. To professionalise schools of the future, contemporary higher education institutions place a great emphasis on strategic planning (Fumasoli, Barbato & Turri, 2020; Mampaey, Huisman & Seeber, 2015). The extent of an institution's understanding significance of strategic planning as reflected in digital publications, compared to traditional official explanations, is viewed as a fascinating topic of inquiry. The main goal of the present research was to establish how institutions of higher education interpret digital age forecasts and how they prioritise digital subjects in their future plans.

This study aimed to determine both how universities in Türkiye reference elements of the digital age and what their future intentions for these elements are. In this regard, the strategic plans of all universities in Türkiye were evaluated in terms of digital age topics mentioned. The focus was on the digitalization features and components that universities emphasised in their strategic plans, as well as the perspective of the digital age taken

according to the type of university. The foresight of universities and the viewpoints of their graduates have the power to shape the environment. Universities, which are the most significant elements of Turkey's higher education system, have the power to help steer the process of digitisation.

1. Digital age ecosystem

The current age, in which the social, economic, and cultural world changes its dimensions by becoming virtual as a result of the Internet, is known as the digital age (Saykili, 2019). It is observed that this age is founded on different living principles from previous eras, and its principles are heavily influenced by the Internet and an ever-proliferating information technology environment (Ismagilova, Hughes, Dwivedi & Raman, 2019; Levin & Mamlok, 2021; Sharma & Behl, 2023). With the so-called knowledge economy – the most accessible, most generated, most stored, and most valued element of this age – the role of information in human life has expanded (Erceg & Zoranović, 2022; Karabulut, 2015; Sillence, Dawson, McKellar & Neave, 2022).

Integration of digital transformations from technologies such as the Internet of Things (IoT), artificial intelligence (AI), and robotics technology inspire fundamentally new approaches in both public and private sectors and their operations (Newman, Mintrom & O'Neill, 2022). Technologies involved in education processes in our digital age, including cloud computing, massive open online courses, games and gamification, virtual reality, and mobile technology are cited as forces that can expedite business life (Hashim, 2018). Therefore, like in other organisations, digitalisation has become one of the most important priorities of higher education institutions (Moldagali, Sultanova, Akhtayeva, Suleimenova & Akimbekova, 2022; Kuzu, 2020). These institutions can help lead the revolution that is occurring in our digital age due to their unique characteristics. Higher education institutions must arguably take on more responsibility as a result of this goal and adopt a far more consistent and forward-looking outlook.

With their assets and intellectual resources, universities are seen to have a significant potential to digitally transform (Rof, Bikfalvi & Marquès, 2020). Peer teaching material and technological advancements offer tremendous chances and possibilities. In the light of the prospects presented by the future and the technology available now, it

is evident that the digital transformation of higher education institutions is inevitable (Kuzu, 2020; Parlak, 2017). This transformation presents opportunities for universities and academics to provide more effective and productive education than in times prior (Taşkıran, 2017).

2. Strategic plan phenomenon

In addition to being a mystery for everyone, the future is a phenomenon that necessitates accurate forecasts that evaluate new opportunities for future success. A strategy's primary objective is to contribute analytically to an accurate estimation procedure. Strategy is the process of occupying a unique position in which various combinations are attempted along an axis of being distinct (Drucker, 1996; Porter, 1996; Huang & Rust, 2021). The word *strategy* has entered the literature of business and other sciences from both its Greek origin and military literature (Davies, 2000). Due to the growth of the American economy, particularly after the Second World War, strategizing has become a principal action. Chandler (1969) noted that there are numerous duties and levels in administrative management procedures pertaining to strategy, and that there are various management options. Consequently, the objective of strategic plans is to raise organisational performance to higher, and measurable levels (George, Walker & Monster, 2019). Due to the rising complexity of the global trade environment, modern firms have begun to embrace strategic management as the safest and most scientific method for understanding environments (Wheelen, Hunger, Hoffman & Bamford, 2015).

The notion of strategic planning was created in the mid-1960s in response to conventional ways of identifying new approaches (Whittington, 2019). It was initially conceptualised in such a way that it could play an essential role in the planning and acceleration of an organisation. Strategic planning refers to the process of making future decisions based on a logical and analytical examination of an external environment (Saruhan & Yıldız, 2017). Strategic plans are one of the most functional and preferred management tools for organisational continuity today (Herbane, 2019; Wolf & Floyd, 2017). Prior to determining a strategic plan, the strategic status of an institution and the selection of to-be-implemented new activities must be defined. Strategic planning is often a state- and nation-wide endeavour, not merely an activity for a single institution (Zagame, 1993). Strategic planning is a process that describes the what, why, and where of

a company's future endeavours. In other words, the process determines what the organisation's primary activities will be and which of the organisation's primary policies will be followed in carrying out these tasks (Şimşek & Çelik, 2016). Moreover, strategic planning is the process of making decisions in a methodical manner, based on the most up-to-date information about the situations that might be encountered in the future, while assuming risks in the current situation; it is a continuous operation of comparing outcomes of decisions made with expectations through rules and feedback (Bryson, 1988).

The significance of strategic planning at universities has been heightened due to various factors, including global public policies, the process of globalisation, advancements in technology, changes in the working environment, reduced public funding, and the influence of students on the higher education system. The increasing emphasis on the quality agenda in higher education, which centres on the utilisation of quantitative performance indicators and institutional rankings, necessitates that institutions revise their methods to plan development and implementation (Horner, Jayawarna, Giordano & Jones, 2019; Shah, 2013).

3. Method

For our focus on the digital age, universities were selected both because their strategic plans were available to view and because of the leadership role they play in shaping modern societies. The full count approach, which enables an evaluation of all units in a population, was employed in the process of defining our sample in this study. With this framework, we conducted an in-depth examination of the strategic plans of all Turkish universities accredited with the Higher Education Council. One hundred and ninety-five out of 212 universities in Turkey have developed individual institutional strategic plans. These 195 universities' strategic plans were analysed in this study.

The aim of this study was to examine the strategic plans of universities in Turkey in terms of the digital age themes addressed therein, which would allow us to make a comparative analysis between predetermined groups. In this context, a series of important digital themes from the strategic plans were revealed, and we investigated whether there was a difference between the determined groups. The content analysis technique carried out within the scope of document analysis was used as an appropriate method to serve this

study's purposes. A content analysis technique can generally deal with written documents, photographs, sound recordings, and different communication symbols in human communication forms (Bal, 2013; Lune & Berg, 2017; Renz, Carrington & Badger, 2018).

Content analysis refers to the organisation of information into categories within the scope of the basic questions of an empirical investigation; it is a research technique that aims to capture objective and regular information, usually drawn from textual artefacts (Bowen, 2009; Kıral, 2020). In addition, although there are various definitions of content analysis (Creswell, 2007), there are two notable issues that all definitions emphasise: The method benefits from "systematic" and "objective" features (Koçak & Arun, 2006). Microsoft Excel and NVivo programmes were utilised throughout the study's scope to code the universities' strategic plans, define the groups, and analyse the data.

3.1. Research process

In order to both identify the concepts that hold particular meanings from the texts and develop themes that explain these notions holistically, an inductive approach was used. In this framework, each university's strategic plan was concentrated on the future and future-related themes, and the content of the documents' titles was analysed, too. The concepts linked with the future were identified in the contents of each document's title, and these concepts were examined and highlighted throughout the entire strategic plan. Each notion was coded uniquely for each university, and the motifs expressing the codes were determined. In this procedure, the codes obtained for the digital age aspects relevant to the future forecast in all university strategic plans and the themes that described these codes holistically were determined. Figure 1 shows the procedure used in this situation.
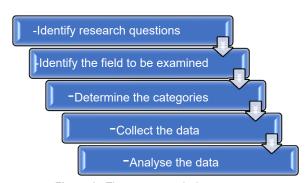

Figure 1   The content analysis process

Source: Adapted from Aytar, 2022; Aytar, 2019; Chun, 2017; Harris, 2001; Krippendorff, 2018; Popping, 2000; Weber, 1990.

3.1.1. Identify research questions

To ensure the validity of our research findings, the first step in our content analysis process was the determination of the study topic and research questions. At this stage, the basic and related questions that both suited the study's objective and would aid the discovery of key phenomena were required. In general, strategic plans exhibit longitudinal coherence by reflecting the organisation's past, current status, and future vision. The concepts found within the study's scope and the themes generated by these concepts were designed to allow for multiple analyses of collected data. The following study design-related research questions were posed:

Q1: Which future-related concepts (code) and themes are included in the strategic plans of universities within the context of the digital age?

Q2: Which concepts (code) comprise which content of the themes included in the strategic plans of universities within the context of the digital age?

Q3: Which specific units are integrated in the strategic plans of universities within the context of the digital age?

Q4: Do the concepts (code) and themes related to the digital age that universities specify in their strategic plans show any difference or similarity in terms of predetermined university groups?

Answers to these questions were to be found during the analysis of collected data, and our analysis also included defining the overall vision for the future of universities in Turkey as well as the potential of universities' strategic plans to accurately forecast the digital age.

3.1.2. Identifying the field to be examined

A strategic plan is a formal commitment that outlines both the present position of an institution under specific conditions and their future actions. The plan's structure and direction are heavily dependent on individual managers. The present research focused on the strategic plans of all Turkish universities in its higher education system. In this framework, the universities' publicly shared strategic plans were examined. University strategic plans are public pledges in which the current situation and future plans are outlined in detail. This research specifically focused on the digital age topics in the strategic plans of Turkish universities.

Turkey has 208 universities, 129 of which are state universities and 79 are educational foundations. It was established that 195 of these

universities had an up-to-date strategic plan, and analyses were conducted on these strategic plans. Again, strategic planning is a component of strategic management. Long-term planning serves as the foundation of strategic planning. It comprises two fundamental components: The term "strategic" is synonymous with "of great significance" for the future (Nickols, 2016). Long-term planning relates to both far-off and long-term issues. The term planning is a top managerial function that attempts to determine the preferred means for achieving a business's desired objective.

As per the scope of this study, reference was made to the publicly available strategic plans of all Turkish universities engaged in education and training. Current university-wide strategic plans were the focus of the investigation of available resources. These materials were collected both from university strategy development departments and official university websites.

3.1.3. Determine the categories

The strategic plans investigated within the scope of this study were categorised using the websites of Higher Education Council (YOK, 2021) and Scientific and Technological Research Council of Turkey (TUBITAK, 2021). The data of state universities and foundation universities were gathered from the YOK website, and the data of research universities selected annually by YOK are discussed. The data acquired from YOK for this study are from the year 2021. On the other hand, the TUBITAK (2021) annual index of entrepreneurial and innovative universities was queried.

This study also made use of the 2021 Entrepreneurial and innovative university index. All universities in Turkey with a strategic plan were analysed, and comparisons were made between state universities, foundation universities,

entrepreneurial and innovative research universities, and foundation research universities.

3.1.4. Data collection and analysis

To find answers to the questions presented at the outset of our research process, concepts relevant to future plans were scanned for in each strategic plan, and the findings of these scans were tabulated.

Figure 2   University Groups
Sources: TUBITAK, 2021; YOK, 2021

The primary objective of this procedure was to determine which themes were emphasised in universities' strategic plans. As a result of our scans, concepts were categorised and themes identified. The aforementioned concepts and themes were organised in Table 1 by matching each code with its proper theme, which was validated by two social scientists and two information and technology (IT) scientists, in addition to the researchers. This method, known as Kappa analysis, is used to examine the reliability of qualitative research procedures; the focus of Kappa analysis is to determine the similarity of observation results from multiple investigators assessing the same subject (Bıkmaz Bilgen & Doğan, 2017; Ertem Vehid & Eral, 2014).

Table 1 Digital age themes and codes in university strategic plans

Concepts (Codes)	Themes
Society 5.0, Industry 4.0, digital content, digital environment, digital resources, digital support, digital attendance, digital literacy, advanced technology, innovation, nanotechnology, new technology	(1) Digital transformation components
smart city, smart building, smart campus, smart class, smart class charts, smart access, smart transport, mobile technology, smart systems	(2) Digital campus
e-learning, e-application, e library, e-book, e-journal, virtual class, virtual reality, web-based training, web portal, information technologies, software	(3) Digital education

technology infrastructure, network infrastructure, artificial intelligence, cyber security systems, wireless, cloud computing systems, database, data security, data processing and storage, internet services, big data analysis, internet of things.	(4) Digital infrastructure
Technology Transfer Office, Digital Transformation Office, Technology Development Zone, Distance Education Centre, Continuing Education Centre, Scientific and Technological Research Application and Research Centre, National Academic Network and Information Centre, Research and Development, Techno-city, Technopark, University-Industry Cooperation, Incubation Centre	(5) Future-focused units

Source: the authors

As per our coding guidebook, the data collection phase was based on our scanning procedure. To ensure that this method was conducted objectively and consistently, it was repeated for each determined-theme group size, and data were collected to enable effective comparison, counting, computation, and evaluation. At the conclusion of this procedure, however, it was possible to discern which university groups shared similarities versus which groups differed.

Table 2 shows the percentages and frequency with which universities in the Turkish higher education system included codes representing digital age themes in their strategic plans.

4. Results

Table 2 Digital age code usage rates

Themes	Codes	%			N
Digital transformation components	Society 5.0	2			4
	Industry 4.0	18			35
	digital content	13			25
	digital environment	53			103
	digital resources	57			111
	digital support	18			35
	digital engagement	5			10
	digital literacy	11			21
	advanced technology	41			80
	innovation	90			176
	nanotechnology	33			64
	new technology	56			109
	robot technologies	21			41
Digital campus	smart city	7			14
	smart building	3			6
	smart campus	14			27
	smart class	21			41
	smart class charts	1			2
	smart access	62			121
	smart transport	7			14
	mobile technology	37			72
	smart systems	21			41

Digital education	e-learning	28		55
	e-application	50		98
	e library	19		37
	e-book	38		74
	e-journal	27		53
	virtual class	19		37
	virtual reality	12		23
	web based training	78		152
	web portal	25		49
	information technologies	78		152
	software	79		154
Digital infrastructure	big data analysis	12		23
	internet of things	11		21
	technology infrastructure	85		166
	network infrastructure	55		107
	artificial intelligence	20		39
	cyber security systems	30		59
	wireless	47		92
	cloud computing systems	10		20
	database	81		158
	data security	16		31
	data processing and storage	19		37
	internet services	81		158
Future-focused units	Technology Transfer Office	75		146
	Digital Transformation Office	3		6
	Technology Development Zone	50		98
	Distance Education Centre	86		168
	Continuing Education Centre	81		158
	BILTEM*	2		4
	ULAKNET**	48		94
	Research and Development	92		179
	Technocity	48		94
	Technopark	57		111

Source: the authors

Topic 1: Digital transformation components

Digital transformation is viewed as a business model development and technology transformation process using distinctive tools, as opposed to the utilisation of technology in business activities; many technologies that drive digital transformation provide new business process paradigms (Fukuyama, 2018; Plekhanov, Franke & Netland, 2022; Tang, 2021). This paradigm challenges the new generation of universities to higher developmental levels by emphasising efficiency and production, with an emphasis on technology and the Internet (Bygstad, Øvrelid, Ludvigsen & Dæhlen, 2022; Li, 2020). It has been discovered that universities' strategic plans place increasingly greater emphasis on the concept of "innovation," which is a component of digital transformation while communicating their future predictions and goals. In the scope of the present study, 175 (90%) of the 195 universities whose strategic plans were analysed mentioned innovation directly. Therefore, this study found that the majority of universities in the Turkish higher education system were mindful

of the economic and scientific potential of the innovation concept and employ it in their future plans. And still, it was discovered that "digital source" and "new technology" were the second and third most prevalent codes in the analysed strategic plans. According to these plans, the Turkish higher education system addressed the issue of digital transformation through innovation-oriented studies, the expansion of digital resources, and the implementation of new technology.

Topic 2: Digital campus

Digital campus refers to the educational complex that enables all higher education-related physical procedures to be performed using internet-based technologies (Liu et al., 2017). This complex includes the digital environment that potentially integrates various teaching and learning systems in order to optimize education, training, and research processes (Huang, Zhang, Hu & Yang, 2012). Of the 195 colleges analysed, 62% (n = 121) whose strategic plans were reviewed as part of the study kept "smart access" – a digital campus component – on their calendars. The emphasis on smart access as a prerequisite for the achievement of the digital campus ideal is regarded as an important discovery, in terms of the frequency with which this concept appeared in plans. Hence, the majority of universities within the Turkish higher education system appeared cognisant of the fact that the mobility elements of the idea of smart access will lead to distinction in higher education. Hence, the concept of smart access is regarded as one of the most functional digital campus components that colleges can use and implement in their future plans.

Topic 3: Digital education

Although the field of digital education, which offers the opportunity to learn independently of time and space, is subject to many criticisms from different angles (e.g., Gourlay, 2021; Komljenovic, 2021), it seems the most functional solution proposal of educational institutions against developments that limit individuals (Belousova, Belousov & Narkevich, 2021; Decuypere, Grimaldi & Landri, 2021). The strategic plans studied here placed great emphasis on the digital education components of "software," "information technologies," and "web-based education" when communicating their future projections and aspirations. Of the 195 universities assessed, 79% (n = 155) of strategic plans mentioned "software"; and 78% (n = 152) contained references to

"information technologies" and "web-based education." As a result, it was found that Turkish universities were typically aware of the interactive potential of software, ITs, and web-based education, and they incorporated these concepts into their future plans.

Topic 4. Digital infrastructure elements

Digital infrastructure refers to the competence and capacity to process, store, and show the data required for a healthy and efficient use of digital tools and processes (Otto, Foreman & Verra, 2008). Components of an organisation's digital infrastructure increase its operating capacity in the digital world. Of the 195 strategic plans reviewed, the concepts "technological infrastructure" (85%), "database" (81%), and "internet services" (81%) appeared in universities' future plans for digital infrastructure implementation. Thus, the majority of universities in the Turkish higher education system appeared cognisant of the digital revolution and planned to exploit the potential of technology infrastructure, database, and internet service concepts. Among the investigated strategic plans, "cloud information systems," "Internet of Things," and "big data analysis" were the least prominent digital infrastructure themes mentioned. The strategic plans of only 19 universities included mentions of cloud computing systems, IoT, and big data analysis.

Topic 5. Future-focused units

There were specific work units referenced in the future plans of universities that are directly related to the digital era. Due to the specific skills that individuals in these units possess and the unique tasks they do, these units were identified with the future. Of the 195 university strategic plans examined, 92% (n = 179) designated a research and development (R&D) unit; 88% (n = 171) referenced a unit of university-industry cooperation; 86% (n = 186) mentioned Distance Education Centre (UZEM); while 81% (n = 159) identified concepts such as Continuing Education Centre (SEGEM) with the digital age.

In the future plans of these units, a direct connection was voiced with the digitalisation processes. Therefore, it was determined that the majority of universities in the Turkish higher education system were/are aware of the economic and scientific potential of R&D, university-industry cooperation, UZEM, and SEGEM, and that these concepts were used concretely in their plans for the future. Again, it was determined that

75% of the examined strategic plans referred to the concepts of Technology Transfer Office (TTO), 57% cited Technopark, and 50% of them reported Technology Development Zone (TGB) in their strategic plans, and the studied universities developed plans, policies, and strategies related to these concepts.

5. Comparisons between universities

As a result of the analyses conducted on publicly available university information, Table 3 shows the theme frequencies of the university groups for the predetermined dimensions. Table 3 displays which university group placed greater emphasis on which themes within each digital age dimension.

Table 3 Comparison of interuniversity theme content

Themes / Universities	State	Foundation	Research	Entrepreneurial and innovative
Digital transformation components	innovation (%91)	innovation (%86)	Innovation (%94)	innovation (%94)
Digital campus	smart access (%66)	smart access (%54)	smart access (%56)	smart access (%52)
Digital education	software & IT (%87)	web based training (%70)	software (%96)	software (%81)
Digital infrastructure	technology infrastructure (%91)	database (%91)	technology infrastructure /database (%91)	technology infrastructure /database (%91)
Future-focused units	research and development (%91)	continuing education centre (%91)	technology transfer office (%91)	research and development (%91)

Source: the authors

Discussion

This study's findings suggest that the digital transformation components of the strategic plans of Turkish universities did not differ by university group. "Innovation" was the most frequent digital transformation term referenced by Turkish universities in their strategic plans. The scientific infrastructure and transformation potential of the innovation notion make it acceptable as the foundational concept of digital transformation in this country's universities.

The "smart access" theme, which was a component of the ideal "digital campus," was the most prevalent topic among university groupings. Smart access technology is required for both the effective usage of mobile devices and the extensive deployment of IoT technologies on campus. The fundamental requirement of the digital campus ideal is smart access. Turkish universities appeared aware of this concept's potential to facilitate the future operation of numerous procedures.

Apparently, Türkiye's universities use software, web-based education, and IT in their digital education components. In terms of these components, per the most prevalent concepts mentioned, "software" was emphasised in the strategic plans of research and entrepreneurial universities; "software" and "information technologies" in state universities' plans; and "web-based education" in foundation universities' strategic plans. Also, it was evident that

"technology infrastructure" and "database" were emphasised in the strategic plans of all universities' digital infrastructure development. It was observed that there was no substantial difference in the strategic plans of the university groups regarding their technological infrastructure proposals.

It was also observed that the proportion of digital transformation-focused "units" in universities' strategic plans varied by university group. It was evident that research universities valued the "technology transfer office" subject more than other universities, and this theme was the most prevalent theme in strategic plans created by research universities. The "continuing education centre" unit was where foundation universities appeared to focus their attention, per their strategic plans. Finally, it was determined that state and entrepreneurial university organisations delegated more responsibilities to their R&D units.

Last, it was evident that studied universities were focused on supporting the quality of education with advanced technology and increasingly effective education solutions in their future plans. It was seen that the frequency of concepts such as "data," "information," "research," and "internet" from our collective text analyses was high. However, it was seen that universities appeared to undertake important tasks in their efforts to reach both their central and unit targets, and the expectations for these units were high.

Conclusion

In today's environment, where technology is continually changing, digital transformation appears inevitable. This shift is accelerated by the impact of technology (which is supposed to make our lives easier) on our lifestyle and institutions' organisational structures. Technology has tended to have a favourable impact on the creation and dissemination of knowledge. Industry 4.0, AI, big data, IoT, robots etc. are evolving quickly as a result of technology, particularly with the development of the Internet to increase mobility and ongoing digitalisation processes. It is obvious that physical constraints, such as the time and space needed to obtain information, have been substantially reduced.

The themes and concepts identified in the research findings are not merely trendy popular phrases but also encompass aims that have been highlighted by the Presidency of Turkey Digital Transformation Office and the Presidency of Strategy and Budget which conducts audits of strategic plans. Senior management places significant emphasis on implementing specific practises and processes to operationalize these notions.

The education industry is unquestionably one of the sectors most affected by digital age developments. The growth of IT ideally helps education become more efficient and creative, for example with AI, virtual reality, 3D printers, and more. With technological advances, education has reached new levels of sophistication. These advances increase the efficacy and prevalence of online education alternatives. Indeed, all facets of education are now directly affected by technological advancements. Expectations for the integration of education and technology have increased by the simple fact that the student population entering university these days is a generation born into technology.

Within the scope of the study, five fundamental themes derived from codes relating to the future of university education in Turkish strategic plans were identified. These themes included elements of digital transformation, a digital campus, digital education, digital infrastructure, and future-focused units. The substance of these five topics was reviewed in relation to four distinct university groups across the nation, and it was determined whether there was a substantial variation in the approach to our digital age based on university type. It was discovered that only future-focused units distinguished these four types of universities considerably.

We hope that our study's methodology and findings will inspire both future scientific research and improved strategic planning of universities. The ideal of a more liveable environment and society filled with content individuals necessitates an ecosystem in which digital technologies are utilised effectively, ethically, and broadly. Universities are attempting to make the future brighter by devising techniques to teach students – our human resource – how to accomplish this objective.

References

Aavik, K. (2019). Crafting neoliberal futures in the strategic plans of Estonian univesities. *Futures*, 111, 148-158. https://doi.org/10.1016/j.futures.2018.10.003

Abad-Segura, E., González-Zamar, M. D., Infante-Moro, J. C., & Ruipérez García, G. (2020). Sustainable management of digital transformation in higher education: global research trends. *Sustainability*, 12(5), 2107. https://doi.org/10.3390/su12052107

Aytar, O. (2019). Do the ethical declarations of companies consist of similar stereotypical concepts and topics? Or are they original commitments? *Business & Management Studies: An International Journal*, 7(4), 1944–1966. https://doi.org/10.15295/bmij.v7i4.1188

Aytar, O. (2022). Is digital visual isomorphism inevitable in successful companies? A Comparison of the colours used on global companies' websites. *Global Business Review*. https://doi.org/10.1177/09721509221126024

Bal, H. (2013). *Nitel Araştırma Yöntemleri*. Isparta: Fakülte Kitabevi.

Belousova, M. N., Belousov, V. A., & Narkevich, L. V. (2021). Digital Transformation of the Educational Process in University in the Context of Globalization. In Socio-economic Systems: Paradigms for the Future (pp. 1267-1277). Cham: Springer International Publishing.

Bıkmaz Bilgen, O., & Doğan, N. (2017). The comparison of interrater reliability estimating techniques. *Journal of Measurement and Evaluation in Education and Psychology-Epod*, 8(1), 63-78. https://doi.org/10.21031/epod.294847

Bonfield, C. A., Salter, M., Longmuir, A., Benson, M., & Adachi, C. (2020). Transformation or evolution?: Education 4.0, teaching and learning in the digital age. *Higher education pedagogies*, 5(1), 223-246. https://doi.org/10.1080/23752696.2020.1816847

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative research journal*. 9 (2), 27-40. https://doi.org/10.3316/QRJ0902027

Bryson, J. M. (1988). A strategic planning process for public and non-profit organizations. Long range planning, 21(1), 73-81. https://doi.org/10.1016/0024-6301(88)90061-1

Bygstad, B., Øvrelid, E., Ludvigsen, S., & Dæhlen, M. (2022). From dual digitalization to digital learning space: exploring the digital transformation of higher education. *Computers & Education*, 182, 104463. https://doi.org/10.1016/j.compedu.2022.104463

Chandler, Jr, A. D. (1969). Strategy and structure: chapters in the history of the American industrial enterprise (Vol. 120). Massachusetts: MIT press.

Cheung, S. K., Kwok, L. F., Phusavat, K., & Yang, H. H. (2021). Shaping the future learning environments with smart elements: challenges and opportunities. *International Journal of Educational Technology in Higher Education*, 18, 1-9. https://doi.org/10.1186/s41239-021-00254-1

Chun, R. (2017). How virtuous global firms say they are: a content analysis of ethical values. *Journal of Business Ethics*, 155, 1–17. https://doi.org/10.1007/s10551-017-3525-3

Creswell, J. W. (2007). Qualitative inquiry and research design. Thousand Oaks: Sage.

Davies, W. (2000). Understanding strategy. *Strategy & Leadership*, *28*(5), 25-30. https://doi.org/10.1108/10878570010379428

Decuypere, M., Grimaldi, E., & Landri, P. (2021). Introduction: critical studies of digital education platforms. *Critical Studies in Education, 62*(1), 1-16. https://doi.org/10.1080/17508487.2020.1866050

Drucker, P. (1996). *The frontiers of management*. London: Routledge.

Erceg, V., & Zoranović, T. (2022). Knowledge management and digital business transformation. *Strategic Management-International Journal of Strategic Management and Decision Support Systems in Strategic Management*, *27*(2), 57-63. https://doi.org/10.5937/StraMan2200007E

Ertem Vehid, H., & Eral, G. (2014). Statistical methods used in the evaluation of qualitative data. *Çocuk Dergisi*, *14*(2), 60-61. https://doi:10.5222/j.child.2014.060

Fukuda, K. (2020). Science, technology and innovation ecosystem transformation toward society 5.0. *International journal of production economics*, *220*, 107460. https://doi.org/10.1016/j.ijpe.2019.07.033

Fukuyama, M. (2018). Society 5.0: aiming for a new human-centered society. *Japan Spotlight*, *27*(5), 47-50.

Fumasoli, T., Barbato, G., & Turri, M. (2020). The determinants of university strategic positioning: a reappraisal of the organisation. *Higher Education*, *80*, 305-334. https://doi.org/10.1007/s10734-019-00481-6

George, B., Walker, R. M., & Monster, J. (2019). Does strategic planning improve organizational performance? A meta-analysis. *Public Administration Review, 79*(6), 810-819. https://doi.org/10.1111/puar.13104

Gourlay, L. (2021). There is no "virtual learning": the materiality of digital education. *Journal of New Approaches in Educational Research*, *10*(1), 57-66. https://doi.org/10.7821/naer.2021.1.649

Harris, H. (2001). Content analysis of secondary data: a study of courage in managerial decision making. *Journal of Business Ethics*, 34, 191–208. https://doi.org/10.1023/A:1012534014727

Hashim, H. (2018). Application of technology in the digital era education. *International Journal of Research in Counseling and Education*, *2*(1), 1-5. https://doi.org/10.24036/002za0002

Hanssen, T.-E.S. & Solvoll, G. (2015). The importance of university facilities for student satisfaction at a Norwegian University, *Facilities*, *33*(13/14), 744-759. https://doi.org/10.1108/F-11-2014-0081

Herbane, B. (2019). Rethinking organizational resilience and strategic renewal in SMEs. *Entrepreneurship & Regional Development, 31*(5-6), 476-495. https://doi.org/10.1080/08985626.2018.1541594

Horner, S., Jayawarna, D., Giordano, B., & Jones, O. (2019). Strategic choice in universities: managerial agency and effective technology transfer. *Research Policy, 48*(5), 1297-1309. https://doi.org/10.1016/j.respol.2019.01.015

Huang, MH., Rust, R.T. A strategic framework for artificial intelligence in marketing. *J. of the Acad. Mark. Sci. 49*, 30–50 (2021). https://doi.org/10.1007/s11747-020-00749-9

Huang, R., Zhang, J., Hu, Y., & Yang, J. (2012). Smart campus: the developing trends of digital campus. *Open Education Research*, *18*(4), 12–17.

Ismagilova, E., Hughes, L., Dwivedi, Y. K., & Raman, K. R. (2019). Smart cities: Advances in research — an information systems perspective. *International journal of information management*, 47, 88-100. https://doi.org/10.1016/j.ijinfomgt.2019.01.004

Karabulut, B. (2015). Bilgi Toplumu Çağında Dijital Yerliler, Göçmenler ve Melezler. *Pamukkale Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 21, 11-23.

Kıral, B. (2020). Nitel bir veri analizi yöntemi olarak doküman analizi. *Siirt Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *8*(15), 170-189.

Komljenovic, J. (2021). The rise of education rentiers: digital platforms, digital data and rents. *Learning Media and Technology, 4*6(3), 320-332. https://doi.org/10.1080/17439884.2021.1891422

Koçak, A., & Arun, Ö. (2006). İçerik Analizi Çalışmalarında Örneklem Sorunu. *Selçuk İletişim*, 22-28.

Krippendorff, K. (2018). *Content analysis: An introduction to its methodology*. SAGE Publications. https://doi.org/10.4135/9781071878781

Kuzu, Ö.H. (2020). Digital transformation in higher education: a case study on strategic plans. *Higher Education in Russia*. 29(3), 9-23. https://doi.org/10.31992/0869-3617-2019-29-3-9-23

Levin, I., & Mamlok, D. (2021). Culture and society in the digital age. Information, *12*(2), 1-13. https://doi.org/10.3390/info12020068

Li, F. (2020). The digital transformation of business models in the creative industries: a holistic framework and emerging trends. *Technovation*, 92, 102012. https://doi.org/10.1016/j.technovation.2017.12.004

Liu, D., Huang, R., Wosinski, M., Liu, D., Huang, R., & Wosinski, M. (2017). Smart learning in digital campus. *Smart Learning in Smart Cities*, 51-90. https://doi.org/10.1007/978-981-10-4343-7_4

Lukovics, M. & Zuti, B. (2017). New Functions of Universities in Century XXI Towards "Fourth Generation" Universities (October 4, 2017). academia.edu 9: Paper ID: 20371078. San Francisco, California.

Lune, H. & Berg, B. L. (2017). *Qualitative Research Methods for the Social Sciences*. Harlow: Pearson.

Mampaey, J., Huisman, J., & Seeber, M. (2015). Branding of Flemish higher education institutions: a strategic balance perspective. *Higher Education Research & Development, 34*(6), 1178-1191. https://doi.org/10.1080/07294360.2015.1024634

Moldagali, B., Sultanova, B., Akhtayeva, N., Suleimenova, A., & Akimbekova, S. (2022). Innovative technologies: digitalisation of education. *Journal of Social Studies Education Research*, 13(4), 209-224.

Murphy, M. & Costa, C. (2019). Digital scholarship, higher education and the future of the public intellectuel. *Futures*, 111, 205-212. https://doi.org/10.1016/j.futures.2018.04.011

Newman, J., Mintrom, M., & O'Neill, D. (2022). Digital technologies, artificial intelligence, and bureaucratic transformation. *Futures*, 136, 102886. https://doi.org/10.1016/j.futures.2021.102886

Nickols, F. (2016). Strategy, strategic management, strategic planning and strategic thinking. *Management Journal, 1*(1), 4-7.

Odabaşı, Y. (2006). Değişimin ve Dönüşümün Aracı Olarak Girişimci Üniversite. Girişimcilik ve Kalkınma Dergisi, 1(1), 87-104.

Otto, G., Foreman, R., & Verra, G. (2008). FIELD OF THE FUTURE digital infrastructure and IT architecture. Paper presented at the *Intelligent Energy Conference and Exhibition,* Amsterdam, The Netherlands. https://doi.org/10.2118/112149-MS

Parlak, B. (2017). Education In digital age: an analysis on opportunities and applications. *Suleyman Demirel University The Journal of Faculty of Economics and Administrative Sciences*, 22, 1741-1759.

Plekhanov, D., Franke, H., & Netland, T. H. (2022). Digital transformation: a review and research agenda. *European Management Journal*. https://doi.org/10.1016/j.emj.2022.09.007

Popping, R. (2000). Network text analysis. In Popping R. (Ed.), *Computer-Assisted Text Analysis* (pp. 97–128). SAGE Publications. https://doi.org/10.4135/9781849208741.n6

Porter, M. E. (1996). What is strategy? *Harvard Business Review*, November-December.

Renz, S.M., Carrington, J.M.,& Badger, T.A. (2018). Two strategies for qualitative content analysis: an intramethod approach to triangulation. *Qualitative Health Research, 28*(5), 824-831. https://doi:10.1177/1049732317753586

Rof, A., Bikfalvi, A., & Marquès, P. (2020). Digital transformation for business model innovation in higher education: overcoming the tensions. *Sustainability, 12*(12), 4980. https://doi.org/10.3390/su12124980

Sandkuhl, K., & Lehmann, H. (2017). *Digital Transformation in Higher Education – The Role of Enterprise Architectures and Portals*. Alexander Rossmann, Alfred Zimmermann (eds.), 49-60, Bonn: Digital Enterprise Computing.

Saruhan, S. C. & Yıldız, M. L. (2017). *Çağdaş Yönetim Bilimi*. İstanbul: Beta Basım Yayım.

Saykili, A. (2019). Higher education in the digital age: the impact of digital connective technologies. *Journal of Educational Technology & Online Learning, 2*(1), 1-15. https://doi.org/10.31681/jetol.516971

Shah, M. (2013). Renewing strategic planning in universities at a time of uncertainty. *Perspectives: Policy and Practice in Higher Education, 17*(1), 24-29. http://dx.doi.org/10.1080/13603108.2012.679753

Sharma, S., & Behl, R. (2023). Strategic alignment of information technology in public and private organizations in India: a comparative study. *Global Business Review*, 24(2), 335-352. https://doi.org/10.1177/0972150919893839

Sillence, E., Dawson, J. A., McKellar, K., & Neave, N. (2022). How do students use digital technology to manage their university-based data: strategies, accumulation difficulties and feelings of overload?. *Behaviour & Information Technology*, 1-10. https://doi.org/10.1080/0144929X.2022.2126948

Schoellman, T. & Smirnyagin, V. (2021). The growing importance of universities for patenting and innovation, SSRN, 1-48. http://dx.doi.org/10.2139/ssrn.3911375

Şimşek, M. Ş., & Çelik, A. (2016). *Yönetim ve Organizasyon* . Konya: Eğitim Yayınevi.

Tang, D. (2021). What is digital transformation?. *EDPACS*, 64(1), 9-13. https://doi.org/10.1080/07366981.2020.1847813

Taebi, B., van den Hoven, J., & Bird, S. J. (2019). The importance of ethics in modern universities of technology. *Science and Engineering Ethics*, *25*, 1625-1632. https://doi.org/10.1007/s11948-019-00164-6

Taşkıran, A. (2017). Dijital Çağda Yükseköğretim. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi* , 3(1), 96-109.

TUBITAK (2021). Türkiye Bilimsel ve Teknolojik Araştırma Kurumu, Girişimci ve Yenilikçi Üniversite Endeksi. Retrieved July 15, 2022 from https://www.tubitak.gov.tr/tr/icerik-girisimci-ve-yenilikci-universite-endeksi.

Weber, R. P. (1990). *Basic Content Analysis*. Sage University Paper Series on Quantitative Applications in the Social Sciences. 49. https://doi.org/10.4135/9781412983488

Wheelen, T. L., Hunger, J. D., Hoffman, A. N., & Bamford, C. E. (2015). *Strategic management and business policy globalization, innovation, and sustainability*. Boston: Pearson Education, Inc.

Whittington, R. (2019). *Opening Strategy: Professional Strategists and Practice Change, 1960 to Today*. Oxford: Oxford University Press. https://doi.org/10.1093/oso/9780198738893.001.0001

Wolf, C., & Floyd, S. W. (2017). Strategic planning research: Toward a theory-driven agenda. *Journal of management*, *43*(6), 1754-1788 https://doi.org/10.1177/0149206313478185

YOK (2021). Yükseköğretim Kurulu, Üniversitelerimiz. Retrieved August 20, 2022, from https://www.yok.gov.tr/universiteler/universitelerimiz

Zagame, P. (1993). Planification stratégique: Quelques réflexions pour une transposition à la planification nationale. *Revue Economique*, *44*, 13-55. https://doi.org/10.2307/3502390

✉ **Correspondence**

Oğuzhan Aytar

Karamanaoglu Mehmetbey University, Faculty of Economics and Administrative Sciences,
Urgan Mah, Karaman 70100, Türkiye

E-mail: oguzhanaytar@kmu.edu.tr