Tactile Collaboration and Backcasting to Design Meaningful Futures and Strategies

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Abstract. *This paper introduces a novel framework integrating backcasting with LEGO® Serious Play to foster radical innovation of meanings within organisations, specifically in higher education. Backcasting, by starting with a desired future state, provides a powerful lens for strategic planning. Combining it with the tangible and imaginative nature of LEGO® Serious Play enhances cognition and ownership, enabling participants to map their values onto the strategic vision. The framework's effectiveness was validated through three participatory workshops. Findings demonstrate the approach can reframe assumptions and stimulate innovative strategic pathways, presenting a human-centred focus to enhance the robustness, adaptability, and future-readiness of organisational strategies.*

Keywords. Design thinking, backcasting, strategy, future of higher education.

1 Introduction

Today's world is characterised by technological disruptions, geopolitical shifts, and evolving societal values, the need for adaptable strategic thinking has never been greater for organisations (Vuorinen et al., 2017). As Greenberg et al., (2024) suggests, we stand at a crossroads between economic stagnation and productivity-driven abundance, making it crucial for organisations to proactively shape their future rather than merely reacting to external forces. One of the key challenges highlighted by van Vliet & Kok (2013) is the need for strategies that can withstand uncertainty and embrace a multitude of potential futures.

Traditional strategic planning models, often rooted in predicting a single, definitive future, prove inadequate in this context (Millar et al., 2018). Instead, organisations need to adopt a more agile and dynamic approach to strategy, one that acknowledges the inherent unpredictability of the future and emphasizes continuous learning and adaptation (Garavan et al., 2024). This shift necessitates a move away from static, long-term plans towards more flexible frameworks that allow for adjustments as the environment evolves. Vuorinen et al., (2017) suggests that organisations should maintain a portfolio of strategic options, each designed to address different potential future scenarios. This approach, often referred to as scenario planning, encourages organisations to envision a range of plausible futures and develop corresponding strategies, ensuring they are prepared to adapt to a variety of potential outcomes. Furthermore, Lee (2018) emphasizes the importance of integrating foresight into strategic thinking, enabling organisations to anticipate potential disruptions and opportunities, and proactively shape their future rather than simply reacting to it.

This is where backcasting becomes particularly relevant. Backcasting, as described in Bibri, (2018) and van Vliet & Kok, (2013), is a planning methodology that starts with defining a desired future state and then works backward to identify the steps needed to achieve that vision. By grounding strategic thinking in a clearly articulated desired future, organisations can make more informed decisions today, ensuring their actions align with their long-term aspirations. Strategy can learn from backcasting the importance of intentionality and a long-term perspective, moving beyond simply reacting to current circumstances and instead actively shaping a more desirable future.

Navigating uncertainty and ambiguity in strategic decision-making is not ideal. When faced with a lack of clarity about the future, organisations need access to rich information and diverse perspectives to make informed choices (Thorén & Vendel, 2018). Workshops provide a valuable platform for gathering such information. By bringing together individuals with different backgrounds, experiences, and

viewpoints, organisations can foster a more comprehensive understanding of the challenges and opportunities that lie ahead. Through facilitated discussions, brainstorming sessions, and collaborative activities, workshops can help uncover blind spots, challenge assumptions, and generate innovative solutions that might not emerge from individual contemplation.

LEGO® Serious Play® (LSP), as discussed in Hadida (2013), offers a particularly engaging and effective approach to facilitating such workshops. By using LEGO® bricks as a shared language, participants can express their ideas and perspectives in a tangible, three-dimensional form. This hands-on, playful approach helps to break down barriers, encourage creative thinking, and foster a more inclusive and collaborative environment where all voices can be heard. Jerome et al. (2024) emphasizes the importance of creating a level playing field in collaborative settings, ensuring that all participants feel comfortable sharing their insights and perspectives. LSP achieves this by shifting the focus away from verbal communication, which can sometimes be dominated by a few vocal individuals, towards a more visual and tactile form of expression.

LSP excels in fostering a deeper understanding of complex topics, particularly in the context of envisioning future scenarios. Magnanini et al., (2021) Fischer & Marquardt (2022) and Manogue et al. (2014) highlight the power of tangible metaphors in facilitating this understanding. When participants construct physical models representing abstract concepts or future scenarios using LEGO® bricks, they engage in a process of externalizing their thoughts and assumptions, making them visible and shareable. This tangible representation allows for a more intuitive and multi-sensory engagement with complex ideas, fostering a deeper level of understanding and shared meaning among participants. The act of building and manipulating physical models helps to break down complex concepts into smaller, more manageable chunks, making them easier to grasp and discuss.

While LSP provides a dynamic medium for collaborative exploration, the true power of this approach lies in its ability to facilitate rich information exchange and collective envisioning. By grounding strategic conversations in a tangible, shared understanding of aspirations, we move beyond the limitations of traditional strategy models, often confined to incremental advancements and reactive responses to current realities. This shift towards a future-oriented, value-driven approach aligns with the principles of meaningful innovation (Verganti, 2016). By starting with a shared vision of a desirable future, we unlock the potential for transformative change, driven not by short-term gains but by enduring human values.

Radical innovation of meanings, as described in (Verganti & Öberg, 2013), goes beyond incremental improvements to existing products or services. It seeks to redefine the very meaning of those offerings, creating new value propositions that resonate with deep-seated human needs and aspirations. This often involves disrupting established industries, shifting paradigms, and creating new markets driven by novel understandings of what is **desirable and meaningful**. Radical Innovation of Meanings is also referred as the fourth type of design thinking, characterized by critique and reflection (Dell'Era et al., 2020).

Similarly, preferable futures are not mere extrapolations of current trends. They represent a conscious departure from the status quo, envisioning a world where societal challenges are addressed, and human well-being is prioritized. This requires a willingness to question existing systems, structures, and beliefs, and to imagine alternative realities that embody desired values and principles. Therefore, both radical innovation of meanings and preferable futures demand a fundamental shift in perspective. By challenging existing paradigms and exploring new design spaces, we can create innovations that are not only technologically advanced but also socially responsible and deeply meaningful.

In contrast to incremental innovation that primarily focuses on optimizing existing products and processes, Norman & Verganti (2013) argue for a more radical approach that challenges fundamental assumptions and explores fundamentally new design spaces.

Dell'Era et al. (2020) and Verganti et al. (2020) highlight the transformative potential of design thinking in the age of artificial intelligence (AI). By placing human needs and values at the centre of the innovation process, organisations can leverage the power of AI to create solutions that are not only technologically sophisticated but also socially responsible and human-centred. Building upon this foundation, Norman (2023) proposed the humanity-centric approach, emphasising the importance of embedding sustainability in its widest definition—ensuring that resources are not compromised and that environmental, social, and economic factors are all considered. This approach necessitates a fundamental shift in perspective, moving beyond a purely market-driven model of innovation towards one grounded in a deep understanding of human values and aspirations. Such a paradigm aligns with the Sustainable Development Goals (SDGs), which advocate for practices that promote environmental stewardship, social equity, and economic viability. Furthermore, the humanity-centric approach incorporates ethical considerations, inclusive design, and long-term impact assessment. By doing so, it ensures that technological advancements contribute positively to society and the planet, fostering innovations that are resilient, equitable, and sustainable for future generations.

2 The Case

2.1 Future of Higher Education Institutions

This interconnectedness of future thinking, backcasting and radical innovation of meanings, provides a powerful framework for navigating the complexities of the 21st century. By embracing a future-oriented, value-driven approach, organisations can move beyond incrementalism and embrace transformative change. This involves engaging in critical reflection on existing paradigms, envisioning desirable futures grounded in human values, and leveraging design thinking principles to translate those visions into tangible solutions.

Addressing the future of higher education (HE) demands more than just responding to short-term issues. As noted by Alexander (2020), proactive planning and strategic foresight are crucial. Trend analysis helps to recognise and comprehend the driving forces behind future developments, such as technological innovations, demographic changes, and economic trends. Building on this, scenario planning creates credible narratives about potential future outcomes.

In the HE context, the imperative for future-proof strategies, grounded in frameworks that emphasize backcasting and collaborative innovation, which allow higher education institutions (HEIs) to anticipate and proactively address these challenges, is particularly pronounced. By fostering a culture of continuous adaptation and leveraging interactive, technology-driven teaching methods, HEIs can enhance their resilience and sustain their crucial role in societal development.

2.2 Contextual Background

Historically, HEIs have been regarded as fundamental drivers of social progress. However, in contemporary times, the sector has become increasingly susceptible to global shifts in technology, pedagogy, and policy, requiring a more adaptive and responsive approach to sustain their pivotal role in societal development.

HEIs are undergoing significant transformations due to various factors. Technological advancements have enabled educational platforms to reach a larger number of students at considerably lower costs, or even for free, as demonstrated by the expansion of Massive Open Online Courses (MOOCs). The COVID-19 pandemic further accelerated the adoption of flexible and digital learning models, allowing MOOCs to mature and gain substantial traction within the education sector.

Simultaneously, the term 'university' has seen a dilution of its traditional meaning. Increasingly, companies and organisations are adopting the term to describe internal training and development programmes aimed at upskilling their workforce or educating the public about their platforms.

To add to the complexity, students' brains present unique challenges for educators due to their shorter attention spans and tendencies toward boredom (Schmitt & Lancaster, 2019). These characteristics are attributed to their constant immersion in digital environments. As a result, Gen Z students often struggle with traditional teaching methods, such as lectures and reading, and instead prefer more visual and interactive learning approaches (Schmitt & Lancaster, 2019).

More than 40% of Gen Z adults spend from 1-3 hours per day in social media, while almost 30% spend from 3-5 hours each day (Creatopy, 2022), leading to what Simon (1971, p.40) described as "a wealth of information creates a poverty of attention". Decades later the information has become ubiquitous and produced in mass. Furthermore, the COVID-19 pandemic has exacerbated these challenges by significantly increasing anxiety levels among university students.

At a more regional level, Post-Brexit, the UK has experienced a significant decline in EU student enrolment. This decline has exacerbated financial pressures on universities, particularly with domestic tuition fees frozen since 2012 despite rising inflation (Coughlan, 2022). Hence, UK universities are caught in a "triangle of sadness" between students burdened with debt, a stretched government, and beleaguered staff, noting that these pressures are likely to worsen as the funding crisis deepens.

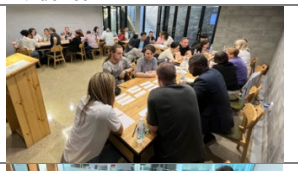
2.3 Research Problem

This methodology was intended to enrich the strategic development process, ensuring that the resulting strategies were robust, adaptable, and reflective of the collective aspirations of the diverse group involved. Additionally, the workshops aimed to contribute to the broader strategic management literature by demonstrating the effectiveness of combining backcasting with tactile collaboration, thereby offering a novel approach for organisations, particularly HEIs, to navigate future challenges and seize emerging opportunities with greater resilience and foresight.

By conducting these participatory workshops in diverse geographical locations—South Korea, the United Kingdom, Slovenia and Chile—and involving participants from twelve institutions and eighteen nationalities, the study aimed to test the framework's applicability across different cultural and institutional contexts. These workshops were designed to facilitate interactive strategic planning sessions focused on the future of HE. Through the hands-on, creative process of building LEGO® models, participants were encouraged to articulate their visions of a desirable future for their institutions and collaboratively work backward to identify the necessary actions to achieve these visions (Table 1). This approach not only

enhanced stakeholder engagement but also promoted creative problem-solving by leveraging the diverse perspectives and expertise of the participants.

Table 1. Visual Summary of the 4 Workshops.

Place	Participants	Evidence
South Korea, 2024	15 Professors, 5 Postgraduate Students, 2 Administrative Staff.	
United Kingdom, 2024	10 Professors, 6 Postgraduate Students, 2 Administrative Staff.	
Slovenia, 2024	8 Professors, 2 Postgraduate Students, 1 Administrative Staff.	
Chile, 2024	7 Professors, 3 Postgraduate Students, 2 Administrative Staff.	

3 Methodology

3.1 Research design and data collection

This study adopts a qualitative research design, utilizing a case study approach to explore and validate the proposed future-proof strategy framework. The qualitative nature allows for an in-depth understanding of participants' perspectives and the nuanced dynamics of strategic planning within HEIs. A case study approach is particularly appropriate for this research as it facilitates a comprehensive examination of the integrated backcasting and tactile collaboration methodologies within real-world settings. By focusing on specific instances of workshop implementation in South Korea, the UK, Slovenia, and Chile, the study captures the contextual variations and cultural nuances that influence strategic development in HE. This approach enables the researchers to gather rich, detailed data and generate insights that are both contextually grounded and transferable to similar organisational environments.

The workshops used primarily the LSP approach which was rooted on Constructivism and Constructionism. Constructivism, as posited by Piaget, focuses on how individuals construct their own understanding through experiences. In the context of LSP, participants built personal models that reflected their individual understandings of what HE could become. This is highly relevant because each participant's background and experience shaped their unique contributions. On the other hand, Constructionism (Papert, 1993) extends this by suggesting that learning happens most effectively when people are actively involved in constructing external artefacts in the world—such as through building models. In this study, LSP allowed participants to physically manifest their ideas about the future, thus facilitating deeper reflection and group discussions. Constructionism in this study means that participants not only construct physical models but co-construct shared meanings of what the future of HE can look like.

Kishita et al. (2024) proposed a comprehensive design framework aimed at guiding researchers and practitioners in the effective planning and operationalisation of backcasting methodologies. This framework systematically addresses the critical questions of When, Which, How, and What to facilitate the successful implementation of backcasting in various contexts. The framework is structured into four primary sections: Usage, Types, Application, and outcomes, each corresponding to the questions and providing a structured approach to backcasting.

South Korea, the UK, Slovenia, and Chile were deliberately chosen for this study due to their complementary profiles and diverse geographical and cultural contexts. South Korea's advanced integration of technology in education, coupled with its highly competitive academic environment, provides valuable insights into innovation and excellence. The United Kingdom, with its longstanding academic tradition and internationalisation, offers a robust framework for research and policy development. Slovenia represents an emerging HE market with a strong emphasis on sustainability and regional collaboration, highlighting progressive approaches to educational reform. Meanwhile, Chile's significant expansion and focus on innovation and entrepreneurship in HE illustrates effective strategies for increasing access and fostering economic relevance. This diverse sample aligns with the United Nations' Sustainable Development Goals, particularly in promoting quality education and sustainable development, thereby enhancing the relevance and impact of the research on an international scale.

Using a purposive sampling approach, the participant selection for this study prioritised individuals with insider knowledge and critical perspectives on HE to ensure targeted data collection, enriching the study's understanding of global educational trends and best practices. Thus, the authors' personal networks were leveraged to obtain the balance of professors of varying seniority, academic staff, and postgraduate students, and the required experience. While workshops took place across different countries, at least half of the participants in each location were from the host country. International participants represented a

diverse range of countries, including Kenya, Chile, Slovenia, Ireland, the UK, South Korea, Poland, North Macedonia, and Estonia.

Data was collected throughout the workshops using multiple qualitative methods, including recordings and transcriptions. A combination of conversations, discussions, and reflections arising from the activities was systematically gathered. Each session was meticulously recorded, and detailed notes were taken to capture both the interactive discussions and the tangible outputs generated through LSP. This comprehensive data collection approach ensured the capture of all relevant information for subsequent analysis. The data included the description of their physical models – created by participants to represent their ideas.

In this qualitative study, the primary data came from participatory workshops using LSP – an innovative facilitation technique that encourages participants to construct physical models representing their visions and ideas, expert interviews, and scenario-building exercises. The focus was on gathering rich, interpretative data that reflects participants' perspectives, imagination, and co-created meanings of the future of HE.

The workshops were structured around an adapted backcasting framework from Kishita et al., (2024), and on average lasted around three and a half hours, where the participants first got to know each other better and then were guided through the steps of the framework. The facilitator remained the same in all workshops to maintain consistency and was always present during the participants' discussions and LEGO® creations to provide support and guidance. Table A1 in the Appendix shows the summary of application of the framework in the project. This strategic planning method was tailored to focus more on conceptual strategy rather than the delegation and implementation of the vision, allowing participants to concentrate on the overarching goals and transformative ideas. The adaptation incorporated elements from Balagatas (2024), ensuring the process was comprehensive and adaptable to the study's specific time constraints and conditions.

In addition to LSP, expert interviews were conducted with educational professionals, policymakers, and thought leaders to supplement the workshop data with authoritative insights and diverse perspectives. Scenario-building exercises were utilised to create narrative pathways from the present state of HE to envisioned future scenarios, enabling participants to explore various potential developments and their implications.

3.2 Data Analysis

The study employed Thematic Analysis (TA) as the primary method for analysing the collected qualitative data. More than 30 hours of recorded conversations and interactions collected throughout the workshops was transcribed and analysed. TA is a flexible and widely used approach that facilitates the identification, analysis, and reporting of patterns (themes) within the data (Braun & Clarke, 2006). This method was chosen for its ability to handle complex and multifaceted data, making it suitable for exploring participants' diverse perspectives on the future of HE.

Following Braun and Clarke's (2006) six-phase framework, the data analysis process began with familiarisation, where researchers transcribed and immersed themselves in the workshop recordings and notes. Initial codes were generated by systematically identifying significant statements and labelling them accordingly. These codes were then collated into potential themes by examining their interconnections and relevance to the research objectives. The themes were reviewed and refined to ensure they accurately represented the underlying data, resulting in a coherent thematic structure. Table 2 shows an extract of the emerging themes from the analysis.

Table 2. Thematic Analysis

Themes	Codes	Extracts from the Transcripts
1. Mind wandering	Unstructured Thought	" When we allow a few moments of unstructured thought, students often make surprising connections that deepen their understanding of the subject matter". S5CH
	Free Exploration	"…By giving both [students and staff] the freedom to explore topics without the constraints of rigid curricula, we naturally spark curiosity and more intentional engagement". S1SLV
Discouraging self-organisation	Group Dynamics	"We're witnessing less and less organic self-organisation, where they [students] form groups around shared interests". S9CH
Coaching	Non-traditional teaching	"The flexibility for both students and staff to design their own sessions has created a natural synergy that truly reflects our collective interests".S6SK
Empowering Originality	Bold ideas	"[as a smaller institution] … It doesn't make sense anymore to focus on chasing trends from bigger and more established universities; we need to have the confidence to make bold decisions that reinforce the importance of making choices that reflect our reality". S11CH
Acknowledging digital disruption	Digital Affectations	"Reducing the use of devices [laptops, tablets and phones] in the classroom must be a priority. Students don't engage deeply when they are overwhelmed by digital distractions." S9SK

	Observed benefits of Digital	"When we implement measures to cut down on unnecessary digital usage, students become more present and reflective during discussions". S8SLV
Prioritizing Staff Wellbeing	Student satisfaction	"For me, staff comes at the centre also […] focusing on our wellbeing isn't just beneficial for us, it has a direct, positive impact on student satisfaction, as we are the human face of the institution and serve as guides on their educational journey". S7NWC "I don't like going above and beyond to treat my students as customers, we are not service providers, we are educators". S2SLV "The university focus in student's experience feels transactional". S2SLV

4 Findings

The study highlights the critical role that fostering mind-wandering and curiosity can play in increasing attention spans within the classroom. By creating environments where both students and professors can self-organise around their interests, free from the constraints of rigid curricula and excessive assessment pressures, there is a natural impetus towards exploring ideas in innovative and unstructured ways. This shift from a prescriptive educational model to one that values organic intellectual exploration supports not only deeper engagement with the subject matter but also encourages the development of intrinsic motivation. As a result, both students and staff are empowered to pursue originality over imitation, thereby cultivating confidence in their visions, decisions, and actions rather than merely chasing trends.

The use of Tactile collaboration transcended mere model-building; it became a language of metaphors. Participants didn't just describe concepts like stakeholder collaboration or pathways to success—they built them, using bridges to represent connections, networks to symbolize interdependence, and even dragons to embody challenges overcome through knowledge. This tactile, metaphorical process demonstrably sparked multifaceted discussions, moving beyond abstract ideas to shared interpretations grounded in physical creations.

The "Geppetto Effect," as discussed in Valencia and Pearce's study (2019), refers to designers' propensity to focus intensively on perfecting a product, often to the detriment of broader business considerations. A similar perspective can be applied to strategy, which should be understood as a dynamic and iterative process requiring craftsmanship, continuous refinement, and ongoing adaptation. Tactile collaboration offers a means for teams to visualise strategic progress, develop prototypes, incorporate feedback, and refine their strategic vision through tangible interactions. By embedding these principles into their strategic frameworks, organisations can cultivate greater flexibility, resilience, and long-term success across diverse sectors.

The results of the interventions reflect six key thematic directions that HEIs could adopt to shape a new, more meaningful future, while outlining potential pathways for further exploration and learning derived from each scenario:

1. Increase of the attention span: Stimulation of mind wandering and curiosity to improve intention and attention in the classroom.
   - Scenario: It is the year 2035, and universities no longer operate under rigid curricula that dictate the learning process. At university, students begin each semester by enrolling in Curiosity Labs, an initiative designed to stimulate exploration through structured mind-wandering. Instead of traditional lectures, professors act as facilitators, presenting weekly exploration themes that invite students to engage in associative thinking and inquiry-driven discussions.
   - Proposed further exploration can be aimed at validating the pedagogical effectiveness of structured mind-wandering, exploring its impact on cognitive flexibility, creativity, and HE problem-solving, and employing longitudinal studies about how self-directed inquiry and associative thinking influence students' ability to engage with complex and interdisciplinary problems.
2. Students and professors self-organise around interest: Structure follows functions and interests and there is freedom to explore ideas without curricula
   - Scenario: In 2035, universities no longer dictate rigid degree pathways. Instead, students and faculty form Knowledge Guilds, dynamic learning communities that self-organise around evolving academic and industry challenges. Rather than passively attending pre-planned courses, students play an active role in shaping their learning journey.
   - Proposed further exploration can employ ethnographic studies of self-organised student groups to examine the emergence of collaborative governance and learning norms and develop comparative case studies of HEIS implementing student-led course design initiatives.
3. Leading to change not to chase: Improve students and staff originality over imitation, stimulating confidence in visions, decisions, and actions.
   - Scenario: In 2035, universities have shifted from being institutions that merely prepare

students for existing job markets to becoming innovation hubs that nurture original thinking and visionary leadership. Students no longer follow prescriptive career pathways but instead engage in "Vision Labs", programmes designed to help them formulate, test, and refine their own unique ideas rather than imitating existing solutions.

- Proposed further exploration can assess the effectiveness of structured ideation and hypothesis-driven thinking in preparing students for future uncertainties and focus on experimental studies evaluating student decision-making abilities.

4. Digital discipline: Reduce screen time to stimulate independent thinking.
   - Scenario: In 2035, students and faculty participate in Digital Detox Days, a weekly initiative designed to counteract the cognitive overload of constant digital engagement. By implementing intentional screen-free moments, universities create an environment where students can reclaim their ability to think independently, free from the constant demands of digital consumption.
   - Proposed further exploration can involve randomised controlled trials measuring cognitive load, attention span, and retention rates in students who participate in Digital Detox Days as well as neuroscientific studies using fMRI or EEG to analyse brain activity differences in screen-based as opposed to screen-free learning.
5. Concentration on staff wellbeing to boost student satisfaction: Highlight professor as the main touch point for student's interactions.
   - Scenario: In 2035, universities have implemented a faculty wellbeing programme that ensures professors have protected time for deep work, research, and professional development. Administrative burdens have been reduced, allowing faculty to focus on meaningful engagement with students. Instead of rushed interactions, they engage in long-form dialogue, exploring ideas in depth.
   - Proposed further exploration can benefit from mixed-methods studies assessing correlations between faculty workload balance, wellbeing metrics, and student satisfaction scores and meta-analyses of faculty retention rates and their relationship to wellbeing interventions.
6. Seeking social impact instead of customer-student impact.
   - Scenario: In 2035, a consortium of European institutions has pioneered a new evaluation model, where universities are judged by their contribution to society rather than customer-driven metrics. Institutions are evaluated based on their engagement with local communities, the launch of social enterprises, and research that benefits the public good.
   - Proposed further exploration can use longitudinal studies tracking university alumni contributions to societal innovation, policy changes, and entrepreneurship and perform comparative institutional analysis of universities that have shifted from customer-based metrics to societal impact indicators.

At a prototype level, these scenarios offer valuable insights into their practical application, potential roadblocks, anticipated benefits, and possible drawbacks. By examining these speculative futures, institutions can better understand the challenges and opportunities associated with their implementation, ultimately informing more effective and sustainable strategic decisions in HE.

Fig. 1 provides an overview of the findings and priorities that stem from these six thematic directions on a matrix of an impact-effort relationship.

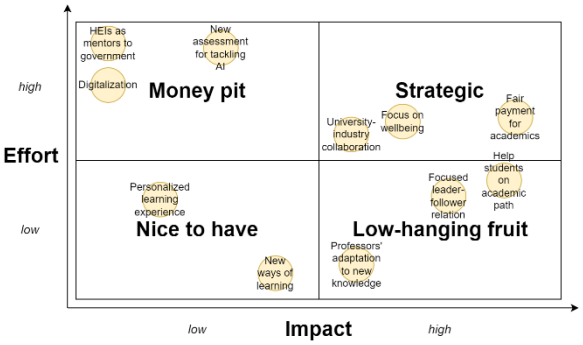


Figure 1. Impact-effort matrix of priorities from identified six thematic directions

5 Discussion

The findings underscore how a participatory, future-oriented framework can enrich HE strategy by bridging foresight and collaborative design. In practice, combining backcasting with LSP enables stakeholders to co-create visionary strategic narratives rather than remain confined to reactive, incremental planning.

Real-world examples illustrate the potential of such frameworks. Kalra et al. (2024) described various participatory backcasting applications, among which in university settings, where lecturers and students engage in envisioning the future of HE. Similarly, LSP has been used in academic contexts for purposes ranging from improving group dynamics to planning curricula (Wheeler, 2023), evidencing its versatility and positive impact on engagement.

Applying this framework in diverse institutional contexts can yield significant benefits for pedagogy, organizational culture, and strategic capacity. Pedagogically, the constructivist underpinnings of the LSP method may inspire a shift toward more experiential and student-cantered learning. When university stakeholders actively "build" future

scenarios, they internalize principles of active learning that could translate into more innovative teaching practices and curricula (Wheeler, 2023). Institutions that embrace such playful, creative exercises might see a cultural shift toward a more open, innovative organizational culture that values collaboration and imaginative thinking (Jerome et al., 2024). Over time, these cultural changes can enhance an institution's strategic capacity. By normalizing foresight activities and creative ideation, universities build internal capability to anticipate and adapt to change. (Ziegler & Porto-de-Oliveira, 2022).

However, we note some research constraints to these implications. First, there may be some potential biases in participant selection and representation. Second, generalizing the results across different cultural and institutional environments is challenging. So, we intentionally spanned workshops across four countries and indeed observed that context matters. The method's playful format, while generally an asset, might be perceived as lacking seriousness by some participants or decision-makers, potentially undermining buy-in. Participants unfamiliar with LEGO® or uncomfortable with creative play may initially struggle, which could limit their initial engagement.

6 Conclusions

Future studies have recently emerged as a valuable source of inspiration for policymaking and strategy development. Depending on the context, future studies adopt different names and scopes; however, the underlying processes and tools remain largely consistent. This study aimed to integrate frameworks drawn from various disciplines to create an amalgamation of tools designed to help organisations learn from what is possible and envision what is preferable.

The combination of tactile collaboration and future thinking benefits from the deliberately slower pace of the intervention, allowing participants time to think carefully and reflect on their responses. In an international setting, anecdotal evidence from this study suggests that this approach can help overcome language barriers by enabling non-native speakers to use tangible metaphors to express complex ideas.

The collaborative story-making process played a central role in shaping future visions during each session. Workshops moved beyond the construction of static models, encouraging participants to weave narratives around their creations. This process of storytelling, prompted by the shared act of building and manipulating LEGO® structures, facilitated the exploration of potential pathways from the present to desired futures. The data generated—particularly the transcribed narratives—appears to contain rich insights into the specific steps, milestones, and potential challenges identified through the sessions.

Future research will expand on these preliminary scenarios, developing them into comprehensive visions and narrative-based scenarios that illustrate possible trajectories for the future of HE. It will also seek to identify the empirical studies and theoretical analyses required to assess the feasibility, desirability, and viability of these envisioned futures.

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Appendix

Table A1. Application of the Design Framework for Backcasting (Kishita et al., 2024) to this study.

Section	Item	Description	This study
A. When is backcasting used?	**Goals**	Define long-term and highly significant goals.	Define long-term strategic planning for HEIs within the global network belonging to the GETM4 project to address future challenges by 2034. To create the vision of the future that later on it could be translated to goals and objectives, a couple of questions were explored – What is the most meaningful gift that Universities give to students? And What is the most meaningful gift that Students give to society?
	Objectives	Define project objectives, including shared visions, managing conflicts, and developing models.	Develop shared visions for the future of HEIs, gain clarity to combat ambiguity and enhance resilience through human value prioritisations.
	Time Horizon	Specify the timeframe for backcasting projects: short-term (up to 10 years), mid-term (10-30 years), or long-term (over 30 years).	Mid-term 10 years.
	Scale	Determine the scale of the project.	Global scale, involving multiple international HEIs from countries like South Korea, Slovenia, Poland, Ireland, North Macedonia, Estonia, Chile, and Kenya.
	Domain/ Topic	Identify the sectors or topics covered.	HE Strategy, Sustainability, Technological Integration, and Pedagogical Innovations.
	Core Partners and Target Groups	Identify key stakeholders and partners, including researchers, policymakers, and corporate strategists, depending on the interdisciplinary nature of the project.	Researchers, administrative staff, professors and students belonging to the research conglomerate GETM4 representing 14 nationalities.
B. Which type of backcasting is chosen?	**Goal-Oriented or Path-Oriented**	Choose between goal-oriented backcasting (focusing on achieving predefined goals) and path-oriented backcasting (exploring how future scenarios might develop from current trends).	Goal-Oriented Backcasting to establish clear changes necessary to adapt to emerging circumstances in HE. Create a shared vision among the participants.
	Degree of Participation	Determine the level of stakeholder involvement, ranging from non-participatory to highly participatory approaches involving various stakeholders such as citizens, policymakers, and industry experts.	Highly Participatory, involving stakeholders through three international workshops using LSP and other participatory methods.
	Qualitative or Quantitative	Decide whether the backcasting will use qualitative data, quantitative data, or a combination of both based on the project's focus.	Qualitative data from workshops participants.
C. How is backcasting applied?	**Process**	Outline the sequence of steps and activities, including problem framing, scenario development, and pathway exploration, aligned with the project's objectives.	Use of LSP to create shared visions within the participants. Followed by a Backcasting exercise to create a roadmap of actions to build a desirable future.
	Methods and Tools	Select appropriate methods and tools such as design techniques, analytical models, participatory workshops, interviews, questionnaires, logic trees, road mapping, and simulation models to support the backcasting process.	Problem identification, Problem Framing, Interactive Problem Solving and Visualisation using LSP, activity Prioritisation Matrix and Human Value prioritisation.
D. What are the results and outcomes?	**Content Results - Conclusions**	Generate design elements like visions, pathways, proposals, and interventions; analytical findings; knowledge regarding policy and sustainability; models and simulations; and refined methods and tools.	The development of six thematic directions that synthesise the topics and reflections gathered from the four workshops.