
Identity-based Innovation Teaching: Empirical evidence from students' self-reflection and the development of their own future

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Abstract: This paper examines the shift from process-oriented innovation teaching toward identity-based approaches in higher education. Drawing on literature on future skills, creativity, and innovation competence, it argues that traditional teaching methods—focused on tools and processes—fail to foster an innovative self-concept. Using a qualitative study of 28 students engaging in 21-day self-reflections and developing “hero profiles,” the research reveals that students primarily perceive themselves as stabilizers rather than innovators, emphasizing control, resilience, and structure over experimentation and risk-taking. While analytical and social skills are strong, a lack of experimentation limits innovation potential. The findings highlight a gap between innovation competence and identity, suggesting that sustainable innovation requires transformative learning processes that build creative self-beliefs, encourage reflection, and support the development of an adaptive, innovation-oriented identity in students.

Keywords: innovative identity, self-reflected learning, identity-based innovation teaching, innovation mindset, higher education

1 Innovation Teaching in Higher Education

Higher education environments are undergoing profound transformation driven by technological acceleration, globalization, and increasing societal complexity. In these turbulent contexts, innovation has become a central competence for individuals, enabling them to navigate uncertainty, respond to emerging challenges, and actively shape future developments. It is therefore extremely important for university graduates not only to acquire specialist knowledge during their studies, but also to develop confidence in their own problem-solving abilities and to be able to come up with innovative solutions to new challenges independently. (Ehlers/Eigbrecht, 2024/Burnham, 2023)

The importance of personal innovation skills in higher education has already been examined and confirmed in numerous studies. Crosling, Nair and Vaithilingam (2015) demonstrate in their work that the quality of education depends heavily on whether a creative learning ecosystem is established that enables the development of innovative identities. Rather than merely imparting knowledge, learning environments should specifically promote creativity, critical thinking and collaboration. This fosters innovative capacity and identity in individuals and in their interactions with others. (Crosling et al., 2015)

In recent years, Ehlers and Eigbrecht (2024) have conducted extensive research into future-oriented skills in higher education. They argue that, in later professional life, it is not necessarily specialist knowledge that determines one's career, but rather so-called 'future skills' – that is, the ability to act in a self-organized manner within uncertain and rapidly changing contexts. Career competence therefore means solving complex problems independently, continuously developing oneself and being able to cope with uncertainty. The focus is on cross-disciplinary skills such as self-organization, learning ability, creativity, cooperation and the reflective handling of new situations. Higher education institutions must therefore move away from the mere imparting of knowledge towards the targeted development of these skills, for example through project-based and collaborative learning. The development of an innovative identity is central to this. (Ehlers/Eigbrecht, 2024)

Cronin and Zwissig (2024) show in their work that the employability of their students in their later career depends on transferable skills. The paper explores the readiness of management students for the workplace in the context of graduates' ability to adapt to fast-paced changes and quickly acquire new skills, abandoning obsolete ones, by applying for example the learn, unlearn, and relearn concept. Focus is placed on the importance of developing transferable skills, highlighting the importance of adaptability and a creative confidence as modern management capabilities. (Cronin/Zwissig, 2024)

The approach taken by Julia Brasse et al. (2023) to identifying future skills is based on an empirical, data-driven analysis of real-world labor market requirements rather than purely theoretical models. Specifically, large volumes of job advertisements and skills requirements are systematically analyzed to reveal which skills are actually in demand and how these change over time. The key findings of the study show that digital skills (e.g. data analysis, understanding of AI), cross-disciplinary skills (such as problem-solving, communication, self-reflection) and domain-specific combined skills are particularly crucial for future employability. It is striking that hybrid profiles are becoming increasingly important – that is, the combination of specialist knowledge with cross-disciplinary skills – and that requirements are changing at an ever-faster pace, which is why a good personal approach to innovation plays a key role (Brasse et al, 2023)

The OECD Skills Outlook 2025 highlights, in particular, ‘adaptive problem solving’ – that is, the ability to devise solutions in dynamic and uncertain situations – as a key skill for the future in the context of digitalization, AI and global change. Education systems must foster an attitude towards innovation and continuous development and ensure that people are actually able to apply their skills in productive work contexts. (Borgonovi et al., 2025)

Through its Futures Literacy Initiative, UNESCO emphasizes that the ability to imagine different futures is a key competence. Futures literacy does not mean prediction, but rather the conscious use of visions of the future to make better decisions in the present. It helps us to deal with uncertainty and complexity by making alternative developments visible and open to reflection. (Sipl et al., 2023)

From these perspectives, there is a clear shift in the training profile and learning content: away from stable, narrowly defined technical qualifications towards dynamic competence profiles that focus on adaptability and innovation.

In future, university graduates will be sought after as adaptive problem-solvers who can independently navigate complex and new situations. What is expected is a positive attitude towards change, the ability to think in terms of solutions, and the capacity to act independently time and again in rapidly changing environments.

For learning content, this means a shift from a static curriculum to flexible, practical and problem-oriented formats. Content is understood less as fixed material and more as a starting point for project-based, self-reflective learning in which real-world issues are discussed. At the same time, meta-skills are becoming increasingly important, such as the ability to innovate and create alternative futures. This requires learning approaches that go beyond skills development and that focus on developing innovative and creative identities that support problem solving and new solutions on a meta-level.

2 Dominant Innovation Teaching Practices, Limitations of Current Approaches and Identity-based Innovation Teaching

In light of the arguments set out above, the current practice of teaching innovation certainly warrants scrutiny. For over two decades, university curricula have been dominated by domain-driven subject knowledge and merely process-centred formats, such as State-Gate-Models, Design Thinking, Lean Startup, and various agile methodologies. Innovation models, processes and methods along the innovation process have been in the centre of innovation teaching. While these formats successfully teach students the "mechanics" of the innovation process, a significant implementation gap remains. Innovation management systems seemed to be more important than innovative mindsets and innovation teaching focused more on the mechanical than on the personal perspective on innovation. Burnham (2023) highlights that the true value of innovation in teaching and learning is often lost when it is treated as a modular subject rather than an integrated mindset. Students graduate with a toolkit of methods but often lack the personal motivation and identity-based attitude required to navigate the high-risk, high-uncertainty environments where actual innovations are born. (Burnham, 2023)

The core of the problem lies in the "process-only" approach. As Hero, Lindfors, and Taatila (2017, p. 105) argue in their systematic review of individual innovation competence, true competence is a multifaceted construct consisting of personality traits, social skills, and cognitive flexibility, not just procedural knowledge. Innovation teaching

should not aim purely at imparting practical skills; it must integrate innovation into the students' life realities and their self-image. To move from a student who "knows" innovation to a professional who "is" an innovator, one must bridge the gap between academic exercise and personal identity. Without this internal alignment, students perceive innovation tasks as external requirements rather than a central tenet of their future professional actions (Burnham, 2023, p. 18).

The shift toward "identity-based" innovation pedagogy is a nascent but critical field. The literature increasingly recognizes that the "habits of innovation"—such as questioning, observing, and experimenting—are not just skills but behavioral patterns deeply rooted in an individual's daily life (Hassan et al., 2024). However, most academic frameworks still focus on the output of innovation rather than the internal transformation of the innovator.

Shift towards Identity-Based Innovation Pedagogy

If one follows the debate on identity-based innovation teaching, a shift becomes apparent in the way innovative capacity is developed.

Innovation competence is therefore not merely a set of skills, but requires the integration of knowledge, skills and attitudes. This explicitly emphasizes that, alongside cognitive and methodological aspects, dispositions such as openness, a willingness to take risks, creativity and self-efficacy are particularly crucial. Innovation is therefore always a question of personality and motivation, not merely the application of methods (Ovbiagbonhia, Kollöffel, Brok, 2019)

Recent competency models show that successful innovation is based on a combination of cognitive flexibility, self-regulation and resilience. Individuals with a high capacity for innovation are characterized by their ability to respond adaptively in uncertain situations, to cope with setbacks and to adapt their behavior flexibly to new contexts. Innovation is thus strongly linked to psychological resources that cannot be developed purely through process training, but are deeply rooted in one's self-concept (Ojo, Volkova, 2023).

Literature increasingly distinguishes between 'innovation competence' and 'innovation mindset'. Whilst competence models often focus on observable behavior and skills, the concept of mindset describes deeper attitudes, beliefs and aspects of identity that determine whether individuals even see themselves as potential innovators. Without this dimension of identity, innovation tasks remain external requirements with no lasting impact on professional self-perception. (Kulturel-Konak et al., 2025)

From the perspective of learning and higher education pedagogy, it is argued that the capacity for innovation can only be developed sustainably if learning processes have a transformative effect – that is, if they do not merely train behavior but also change one's perception of one's own role. This includes, in particular, qualities such as curiosity, openness to new perspectives and a willingness to question existing self-perceptions and worldviews. This deeper level is regarded as a prerequisite for the lasting internalization of innovation competence (Kulturel-Konak et al., 2025)

Students' innovative abilities develop more strongly when they are actively involved in shaping the learning process and reflect on their own perspectives. Self-reflection and participation in learning, in particular, promote the development of creative and innovative competence. Innovation arises more strongly where students reflect on and help shape their role in the learning process (Ovbiagbonhia, Kollöffel, Brok, 2019)

A key theoretical foundation for identity-based innovation teaching can be found in Carol Dweck's concept of the growth mindset. Dweck argues that individuals' beliefs about the malleability of their abilities fundamentally shape their learning behaviour, persistence, and willingness to engage with challenges. From this perspective, innovation is not primarily a fixed talent or a set of technical skills, but a capability that develops through effort, reflection, and experience. Learners who adopt a growth mindset are more likely to perceive failure as a learning opportunity, to persist in uncertain and ambiguous problem situations, and to actively seek feedback—behaviours that are central to innovative performance. Consequently, fostering an innovation mindset implies more than teaching methods or tools; it requires shaping learners' underlying self-concept as capable, evolving, and adaptive actors. In this sense, innovation education becomes an identity-forming process in which students progressively internalize the belief that they are able to act innovatively, even in unfamiliar and complex contexts. (Dweck, 2017)

Another important piece of work to understand the development of innovative identities has been written by Mark Runco about Creativity and how it evolves (Runco, 2023). Runco's work provides an important foundation for understanding how creative self-beliefs develop within individuals. He conceptualizes creativity as the production of ideas that are both original and effective, while emphasizing that this capacity exists in all people. Central to his framework is the recognition of everyday creativity, which together with divergent thinking support the development of positive creative self-beliefs. By framing creativity as a universal and developable potential, Runco states that two aspects of an innovative identity: the ability to generate creative outcomes and the belief that creativity is a part of who they are. His emphasis on supportive environments and educational practices further reinforces these beliefs, suggesting that creative self-concept is not fixed but cultivated through experience, validation, and opportunities for idea generation. (Runco, 2023)

Recent research into "Reflective Practice" suggests that self-reflection is the primary vehicle for this transformation. Harvey et al. (2025, p. 3) posit that reflective practice allows students to identify the "tensions between their current selves and their professional aspirations." By analyzing their own routines, students can uncover the behavioral barriers—such as a fear of failure or a need for extreme structure—that inhibit the "Innovator's DNA" (Christensen, Dyer, & Gregersen, 2011).

Christensen et al. (2011, p. 45) identify five discovery skills that distinguish innovators: associating, questioning, observing, networking, and experimenting. Current understanding suggests that while students can be taught these skills in a classroom setting, their effectiveness is limited if the student's personal identity is built on risk-aversion or a "regimented" life view. Thus, the development of "future hero profiles" serves as a narrative tool to help students visualize an identity that incorporates these innovation habits (Hassan et al., 2024).

3 Research Questions

Key to developing an innovative identity is therefore reflecting on one's own abilities and actions, recognizing one's own potential for innovation, and being willing to put innovations into practice.

Based in these insights the following research questions guide the analysis:

- How do students perceive their own reality, routines, and challenges as an innovator when reflecting on their daily lives over a sustained period of time?
- How do students translate these personal reflections into “hero profiles” and which specific attributes (super powers) do they prioritize as essential for their innovative selves?
- In which areas do students possess the personal qualifications for innovation and where are the most significant “identity gaps” or development needs for becoming effective innovators?

4 Methodology

This study utilizes a qualitative, empirical approach based on 21-day self-reflection protocols and hero-profile developments. 28 students analysed and documented their own innovation behaviour in their daily lives over 21 days. Each of them reflected and documented their personal challenges, their personal goals and success and their aspirations. Based on these self-reflections they developed own hero profiles and hero stories using artificial intelligence to visualize them.

The content of these self-documentations has been analysed and coded following the research questions mentioned above. Own personal realities, self-created hero profiles and innovative identities have been analysed and patterns of student behaviour, own perceptions of super powers and innovative identities have been identified.

5 Empirical Evidence

The results provide profound insight into the realities of young people's lives. When reflecting their own behaviour but also their emotions and thoughts for 21 days students give a deep insight into their daily routines and personal struggles.

RQ1: Reflected personal realities and challenges

When analyzing the challenges and described experiences day by day it becomes clear that many of the respondents are searching for structure and security in their everyday lives.

The analysis of the 21-day reflection protocols reveals a striking pattern: students perceive their everyday lives as a highly regimented system. Across the documents, there is a recurring theme of navigating between high performance expectations and a constant search for structure to ward off chaos.

One student describes his life as being driven by a "strong internal drive for perfection" and "content-related flawlessness". Similarly, another student notes her life is "clocked by goals" where she finds satisfaction in "checking off boxes on a to-do list".

Various students describe their reality as a juggling act between work, university, and private life. They perceive a high level of stress due to multi-tasking.

When students reflect on what is positive, they consistently cite social anchors (family and friends), athletic self-efficacy, and the satisfaction of solving a complex problem. These are seen as islands of stability in an otherwise taxing environment.

Negativity is rooted in a lack of boundaries (the inability to say "no") and impatience. The inner critic is a dominant figure in these reflections, often leading to procrastination on unstructured university tasks. It becomes clear that students are aiming to conform and striving for success in their professional life. Planning their career, starting successfully into their professional lives and performing in those uncertain contexts without overworking oneself is a concern that many of them share.

At the same time, it is difficult to find the motivation for existing tasks, to put off unwelcome duties, and to strike the right balance between personal and professional life. Few students are able to articulate clear personal ambitions and areas for development amidst the hustle and bustle of everyday life. Creative work and the pursuit of personal projects take a back seat. The central focus is on the struggle with day-to-day operational tasks and meeting immediate obligations. There is little or no room for pursuing innovative ambitions, and students pay no attention to this in their reflection reports.

RQ2: Derived Innovative "Hero Profiles"

When asked to develop "Hero Profiles" for their future selves, the students build on their personal reflections and tried to identify own talents, interest and aspirations that make them heroes. They did not choose disruptors or rebels. Instead, their heroes are stabilizers and clarifiers. This shows that there is a high need for stabilizing themselves in their daily life routine. It seems that they perceive their lives challenging enough to strive for stability and not innovation. The willingness to take risks, the curiosity needed for exploring new fields and the motivation to create something innovative is rather low. After having various courses of innovation and having created many innovative concepts and solutions this mindset and behaviour has not found implementation in their daily lives yet.

Three types of hero profiles can be identified across all 28 self reflections and hero profiles:

- **The Precision Architect:** This hero possesses the superpower of precision sight, able to see clarity where others see chaos. This is a direct response to the complexity they perceive in their daily work and the need for managing their different roles in life (private, study, work). They have a high ambition to perform and overachieve. They set themselves high goals and strive for perfection.
- **The Anchor / The Rock:** This hero remains calm in the storm and provides security for others. This hero was merely selected by individuals who perceive themselves self confident and capable of managing their life. They often take the role of group leaders among peers and feel confident in setting priorities, often optimizing themselves within a given framework.
- **The Light Bringer / Bridge Builder:** This hero focuses on "connecting people" and "brightening moods," utilizing empathy as a tool for harmony. They see their role primarily as creating harmonious working environments; they look after the people around them and pay close attention to their own well-being and that of those around them. It is important to them that they and others feel emotionally fulfilled and that they have a strong connection with others. Their focus is very much on relationships.

Whilst all these hero profiles are, of course, unique in their own right, these three basic profiles emerge consistently across all 28 documentaries. The key point is that all heroes

use their superpowers to protect their own energy and support others. The most frequently mentioned superpower across all documents is resilience as the ability to stay upright under pressure. This, in turn, highlights the challenge mentioned earlier of navigating the trials and tribulations of everyday life and living up to all of life's expectations. This stress experienced on a daily basis is undoubtedly one of the key features of this self-reflection.

RQ3: Innovative Identities

Mapping these findings onto the Innovator's DNA framework (Christensen et al., 2011) and the competence review by Hero et al. (2017) reveals a paradox: Students possess high observing and questioning skills (analytical depth) and a strong sense of networking (social empathy). One student described the ability to explain complex facts to create *aha*-moments is a prime example of a core innovation habit.

The greatest development gap is in experimenting. The students' strong urge for control, perfection, and structure hinders the courage to fail. Hero et al. (2017, p. 110) note that risk-taking is a central pillar of innovation competence, yet the students' reflections show that they perceive failure as a threat to their carefully constructed order rather than a learning opportunity. So far, students have developed little sense of their own identity as innovators; they see themselves as good observers and analysts, but have so far used these insights merely to solve incremental and familiar problems. Exploring new fields, engaging with entirely new topics, and experimenting with creative or innovative problems are clearly not a priority.

Their potential for innovation is currently incremental. They are excellent at making existing systems better, faster, and more stable. This also reflects their expressed need for control, security and predictability in life.

However, radical innovation requires a willingness to destroy existing structures, which conflicts with their hero identities as anchors and architects (Hassan et al., 2024).

6 Conclusion

The study provides critical empirical evidence for the necessity of "Identity-based Innovation Teaching." It shows that a student's perceived everyday reality marked by stress and a search for orientation is a direct inhibitor of radical innovation capacity.

It seems that students are caught in a safety trap that hinders them from using their full innovation potential. As long as students view their heroic self primarily as a provider of stability and a seeker of perfection, they will gravitate toward incremental improvements. This aligns with Harvey et al. (2025, p. 8), who suggest that without deep reflection, practitioners simply replicate existing patterns.

This raises a few pedagogical implications. Universities must move beyond teaching tools and start teaching ambiguity tolerance. Curricula should include unlearning exercises that intentionally disrupt student routines, forcing them to navigate unregimented spaces where to-do lists are unavailable (Hero et al., 2017).

As AI increasingly automates precision architecture (data analysis, structured implementation), the "human" value in innovation will shift toward radical exploration and complex empathy. If students remain stuck in an incremental identity, they risk becoming obsolete in the face of generative AI that can optimize existing systems more efficiently than any skilled student (Burnham, 2023/ Runco, 2025).

In conclusion, innovation teaching must become a form of identity work. It must empower students to transform their inner anchors into navigators - individuals who do not just survive the storm by standing still but who have the courage to sail into the unknown.

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