On Purpose. Design Principles for Interventions that encourage Students' sense of Meaning in Life in Higher Education

Kris Holkenborg
4 - 6 - 2024
21,005 words

Master Educational Science and Technology
Faculty of Behavioural, Management, and Social Sciences
University of Twente

Examination committee
Dr. A. M. van Dijk
Dr. P. M. Papadopoulos

In collaboration with
Education Innovation Hub
Saxion University of Applied Sciences
Dr. M. Cents & Dr. E. H. Eshuis

Acknowledgement

For two years, I worked on two thesis projects—one that was disregarded halfway through and one that succeeded until the end. In my application letter for the University of Twente, I wrote that my passion lies with meaningful education. I happily reflect on my decision to start a new thesis project and achieve my master's degree with a project about a topic I hold dear. This thesis project has contributed to my critical thinking and articulating perspectives on designing meaningful education.

First, I would like to thank Miriam and Elise, who uplifted me when I was drifting away after putting aside my first thesis project. Their trust in who I am and my capabilities as a researcher helped me restart, get going, be disciplined, and stay motivated throughout the project. Their support helped me tremendously during this journey. Furthermore, I want to thank my Saxion colleagues at the Education Innovation Hub, the Quality & Assurance Office, and other departments for their curiosity and for listening to me rambling about my thesis. Their encouragement helped me to put things into perspective and carry on.

Second, I would like to thank Pantelis for his willingness to step in as my first supervisor at the beginning of my thesis project and, through his questions, guide my thinking process. Moreover, later, as my second supervisor helping me finish my thesis successfully. I did think about the *practicalities* a lot while writing. Also, I want to thank Alieke, who took over the first supervisor role and guided me through the most significant chunk of the research and writing process. I will never forget your feedback, "It sometimes feels like you are writing a textbook for beginning students", as to say to write more concisely. I enjoyed that one. My skills in writing concisely remain to be further developed. Thank you both for your constructive feedback and support during this project.

Third, I would like to thank the respondents who participated in this study. Finally, I thank my family and friends for supporting me throughout the project.

Thanks.

Kris

Abstract

To support students in doubt about their degree program and at risk of dropping out, meaning in life interventions offer a promising approach to promote intrinsic motivation and engagement. Despite previous educational programs, there is little clarity about design factors contributing to adolescents' meaning in life. The Purpose-driven Learning project at Saxion University of Applied Science aims to promote students' sense of meaning in life, and design principles were required for further program development. To develop design principles for meaning in life interventions in higher education, design-based research was executed to answer the need in literature and practice.

In the first phase, a framework for design characteristics was developed based on theory. The interventions in Saxion's Purpose-driven Learning project were investigated through interviews with a teacher, a designer, and a researcher. Results were compared to the theory-derived design characteristics to develop implications for the next phase. Three implications were derived as boundary conditions for the next phase: design characteristics should 1) be refined with multiple procedures and arguments, 2) include didactical approaches and teacher behaviours, and 3) cover the coherence, purpose, and significance dimensions of meaning in life.

In the second phase, two focus group interviews were conducted to gather practice knowledge and refine the design characteristics with procedures and arguments to principles. This resulted in multiple design principles for the framework of design characteristics. Some design characteristics addressed multiple dimensions of meaning in life, such as promoting students' autonomy and providing collaboration opportunities. In addition, the design principles indicate that each dimension has its particular focus. In the coherence dimension, the principles suggest that a design should trigger thinking processes about one's behaviour; in the purpose dimension, promoting taking initiative, setting goals and monitoring processes; in the significance dimension, supporting adolescents through expressing confidence and encouragement. Consequently, multiple dimensions may be addressed when designing meaning in life interventions based on these design principles.

In the final phase, four expert appraisals were conducted to evaluate the expected value of the design principles developed in this study. Experts reviewed the design principles' soundness and feasibility before being interviewed. Although results revealed that design principles were practically justified and feasible for students and teachers, they require adaptations to improve the value of the future users of the design principles. Concerns relate to the high number of principles, the conceptualisation of significance in education, and the framing of the principles. Directions to resolve these concerns were provided, and future research should focus on designing and implementing educational interventions to study the principles' validity.

These findings add to understanding design factors contributing to adolescents' sense of meaning in life in higher education. To implement interventions based on design principles, attention should be paid to creating a shared understanding of meaning in life among teachers and how meaning in life can be shaped in education and train teachers in enacting this type of intervention. This study's design principles contribute to the theoretical design development of meaning in life in education and support the further development of the Purpose-driven Learning project. Ultimately, to help students find the most suitable degree program for their future lives and careers.

Keywords: Meaning in life, Coherence, Purpose, Significance, Design principles, Higher Education

Table of Content

1 Introduction

Since 2010, approximately 35% of first-year higher education students dropped out from or switched degree programs (Lodewijk & Cuppen, 2023). In 2021-2022, 15% of University of Applied Sciences students dropped out and 19% switched programs. Many of these students have limited life experience, making it challenging to develop a realistic picture of a future role and a degree program. Leest et al. (2022) concluded that educational professionals' guidance is one of the crucial measures to prevent switching and drop-out of students. Guidance should be geared towards increasing students' motivation for and commitment to higher education through goal setting and social and academic engagement. Meaning in life (MIL) is considered a promising approach in this regard, as it aims to support students in finding intrinsic reasons for their studies by making meaning of their identities, gaining direction by developing goals they want to achieve in life, and executing plans towards these goals (Steger et al., 2021).

MIL emerges "from the web of connections, interpretations, aspirations, and evaluations that (1) make our experiences comprehensible, (2) direct our efforts toward desired futures, and (3) provide a sense that our lives matter and are worthwhile" (Martela & Steger, 2016, p. 538). The formation of MIL is linked to identity processes during adolescence (Vignoles et al., 2006; Vignoles, 2011) through the dimensions of coherence, purpose, and significance. If developed successfully, adolescents experience higher levels of intrinsic motivation (e.g., Yeager & Bundick, 2009) and academic performance (e.g., Bailey & Philips, 2016). These benefits are not easily attainable as articulating MIL can be complicated for adolescents (e.g., Ratner et al., 2019). Not finding MIL can increase adolescents' dissatisfaction with themselves and their relationships (Steger et al., 2009; Steger et al., 2008b). Scholars, therefore, suggest interventions to support students experiencing MIL in educational curricula (Bundick, 2009; Schippers & Ziegler, 2019).

Several school-based programs and interventions have been implemented and monitored to promote MIL of adolescents directly or indirectly (Steger et al., 2021). Programs steered towards coherence promotion require students to share stories and discuss and execute tasks on the topics of positive emotions, engagement, accomplishment, purpose, relationships, and health, which results in indirect pathways that promote MIL in education (Au & Kennedy, 2018; Shoshani et al., 2016). Purpose programs require students to understand their identity and culture and develop self-efficacy and metacognition (Dik et al., 2011; Kosine et al., 2008). Students reported higher levels of meaning, insights, and direction toward their careers and improved readiness for the future. Despite the MIL dimensions being a primary focus in various programs, there remains a lack of clarity in the intervention literature about the design factors contributing to the sense of MIL in higher education (Steger et al., 2021).

To prevent students from dropping out and guide those who switch degree programs, initiatives have been executed to encourage students' sense of MIL at Saxion University of Applied Science (from now on, Saxion). Design principles are required to disseminate the initiatives' results and upscale to an insert program. To understand ways to encourage the sense of MIL among Saxion students, design-based research is executed. Design principles answer both the question within Saxion and the lack of clarity in the literature on promoting MIL in education. Therefore, this study aims to develop design principles for interventions teachers can utilise to encourage students' sense of MIL in higher education.

2 Theoretical Framework

2.1 Meaning in Life

Meaning in life (MIL) is the experience of meaning through various means, such as striving for significant objectives or constructing a coherent life story (Steger et al., 2006). Through an integrative analysis of meaning and purpose, various scholars developed multifaceted conceptualisations for MIL, of which the work of Martela and Steger (2016) received much support (e.g., Leontiev, 2017; Van Tongeren et al., 2018; Womick et al., 2019). This trichotomy for MIL constitutes dimensions of coherence, purpose, and significance.

2.1.1 Coherence

Coherence refers to the cognitive dimension of people making sense of their lives, involving understanding their identity, worldview, and engagement with the world (Heintzelman & King, 2014; Martela & Steger, 2023; Shin & Steger, 2014). It extends beyond mere perception, requiring the construction of a cohesive mental map that assigns meaning to experiences (Heintzelman & King, 2014; Martela & Steger, 2016). Coherence necessitates pattern recognition, consistency detection, and significance synthesis in life experiences, distilling them into personally important factors (Steger, 2009; Steger et al., 2021). When disruptions or unexpected events occur, people instinctively seek understanding to maintain predictability and stability in their world (Heine et al., 2006; Heintzelman & King, 2014; Steger et al., 2021). Creating coherence thus involves structuring fragmented daily experiences, integrating new encounters, and unifying lived experiences into a cohesive narrative, allowing for adaptive behaviour prediction and control (Shin & Steger, 2014; Steger, 2009). The feelings of stability derived from this process contribute to one's MIL (Heintzelman & King, 2014).

2.1.2 Purpose

Purpose refers to the motivational dimension of core aims and goals that give life direction (Martela & Steger, 2016; McKnight & Kashdan, 2009). It serves as a self-concordant, long-term, stable, overarching mission that is central to a person’s life narrative and actions in life (Damon et al., 2003; McKnight & Kashdan, 2009; George & Park, 2016; Martela & Steger, 2016). A purpose operates across life domains, shapes people’s identities, and lasts a lifetime (Damen et al., 2003; Martela & Steger, 2016; McKnight & Kashdan, 2009). It defines an overarching objective that, in turn, creates a hierarchy for multiple levels of goals, decisions, and actions (Bundick, 2009; Damon et al., 2003; George & Park, 2013; 2016). Unlike goals, purpose does not demand a specific outcome but motivates goal-oriented behaviour (McKnight & Kashdan, 2009). Purpose can be self-oriented or extend to altruistic strivings that benefit others and the world, fostering a more profound sense of

MIL (Yeager & Bundick, 2009; Yeager et al., 2012). Living in alignment with one's purpose provides someone with a self-sustaining source of MIL (McKnight & Kashdan, 2009; Shin & Steger, 2014).

2.1.3 Significance

Significance represents the perception that life is inherently valuable and worth living, evaluating one's past, present, and future (Costin & Vignoles, 2020; George & Park, 2016; Martela & Steger, 2016; 2022). This evaluation goes beyond feelings; it involves assessing life through values, expectations, and standards, considering how one conforms to these criteria given their circumstances (Martela & Steger, 2016). Significance emphasises the value, worth, and importance derived from life's evaluation, including the feeling of mattering in the world and making lasting contributions beyond individual achievements (George & Park, 2016; Ward & King, 2017; Yeager & Bundick, 2009). These contributions can be goal-directed or not, like nurturing family relationships, despite this not being aimed at deliberate goals (Steger et al., 2021). Research indicates that significance is a vital predictor of MIL (Costin & Vignoles, 2020; Martela & Steger, 2023), highlighting the critical role in shaping one's perception of a meaningful life.

2.1.4 Relations between coherence, purpose, and significance

Although research indicates that coherence, purpose, and significance are distinct dimensions (Costin & Vignoles, 2020; George & Park, 2017), they have high intercorrelation (George & Park, 2017; Martela & Steger, 2023). Scholars theorised that coherence shapes purpose and vice versa, mutually influencing goal selection and providing a foundation for determining a suitable purpose (Martela & Steger, 2016; Reker & Wong, 2012). Coherence is proposed as one of the prerequisites for significance (Martela & Steger, 2016). The relationship between purpose and significance is considered intertwined (Martela & Steger, 2016; Park & George, 2013; Weinstein et al., 2012). A purpose is regarded as an essential source of significance. Conversely, a sense of significance sustains motivation to pursue and uphold purposes. In essence, these dimensions of MIL form a complex, interconnected web, highlighting the intricate relationship between coherence, purpose, and significance in the quest for a meaningful life. The following paragraphs describe the development of MIL, its formation, benefits, and adolescents' difficulty formulating it.

2.2 Formation of Meaning in Life in Adolescence

MIL is an essential aspect in the development of adolescence as profound physical, psychological, spiritual, and social transformations occur (Brouzos et al., 2016; Damon et al., 2003). In adolescence, people transition from childhood to adulthood and develop their motivational belief system, identity, and self-concepts (Erikson, 1968). Identity development is critical for creating a

sense of MIL as adolescents dedicate themselves to worldviews and corresponding purposes (Erikson, 1968; Damon et al., 2003). They (start to) perceive needs beyond themselves and conceive purposes that benefit these needs and other people (Fry, 1998; Dik et al., 2011). Therefore, the same processes that form one's identity are suggested to form adolescents' sense of MIL (Damon et al., 2003; Erikson, 1968; Heine et al., 2006). In turn, MIL is suggested to aid in transitioning to later stages of development (Fry, 1998; Steger et al., 2009) and to contribute to the acquisition of psychological strengths and well-being (Damon et al., 2003; Steger et al., 2009).

2.2.1 Benefits of Meaning in Life for Adolescents

Specifically for adolescents, research indicated that MIL contributes to higher levels of academic performance (Bailey & Philips, 2016; Martin Sanz et al., 2017; Nurra & Oyserman, 2018; Oyserman et al., 2006), intrinsic motivation (Bailey & Philips, 2016; Yeager & Bundick, 2009) and well-being (Barcaccia et al., 2023; Brouzos et al., 2016). These findings can be explained as adolescents driven by a sense of MIL are more inclined to take action to progress toward their goals (Makola, 2014; Steger et al., 2021) and provide a reason to learn and link their schoolwork to images of meaningful impact in the future (Yeager & Budick, 2009). In addition, adolescents with higher levels of MIL show higher levels of self-acceptance (Ryff, 1989), self-esteem (Kashdan & McKnight, 2013; Steger et al., 2006), coping skills and adjustment (Creswell et al., 2005; Edwards & Holden, 2001; Park & Folkman, 1997; Yeager et al., 2014), subjective well-being and less depressive symptoms (Bronk et al., 2018; Brouzos et al., 2016; Chen et al., 2019). Furthermore, the synthesis review of Kim et al. (2019) indicated that people demonstrate an increased capacity to control impulsivity and exhibit higher levels of self-efficacy—for instance, decreased alcohol usage (Aloise-Young et al., 2001).

2.2.2 The difficulty of articulating Meaning in Life

However, articulating MIL is difficult for adolescents (Brouzos et al., 2016; Schippers & Ziegler, 2019). Not all adolescents can organise their lives in a coherent story and formulate their purpose, as this requires higher-level planning and information organisation (Carver & Scheier, 2000; McKnight & Kashdan, 2009; Steger, 2009). Adolescents may unconsciously pursue purposes and fail to recognise them as meaningful (McKnight & Kashdan, 2009; Steger et al., 2008a). Ratner et al. (2019) found no significant difference across purpose and meaning conditions when adolescents were asked to write on these topics. This suggested that adolescents have difficulties distinguishing abstract concepts and processes such as MIL and thus fail to recognise them (Steger et al., 2008b). An explanation for this might be that adolescents may not use effective strategies to identify and experience MIL (Schippers & Ziegler, 2019). Scholars, therefore, call for more attention to help adolescents experience MIL (e.g.,

Koshy & Mariano, 2011; Yeager & Bundick, 2009) through educational interventions (Schippers & Ziegler, 2019; Shin & Steger, 2014; Steger et al., 2021).

2.3 Design Characteristics for Meaning in Life Interventions in Higher Education

As MIL is a concept from the field of (positive) psychology, design elements from this field are used to inspire the design of activities in higher education. Many interventions have been tested in psychotherapy, and design elements have been described (e.g., Vos & Vitali's (2018) meta-analysis). Based on these findings, Steger (2022) derived five themes for meaning-focused interventions applicable to contexts other than psychotherapy. The themes allude to what individuals (can) do to experience MIL at a personal action level. These are:

1. *"Consciousness* – Develop tools to notice, reflect on, and make meaning from our lived – and imagined – experiences;
2. *Time* – Utilise and integrate the full array of time perspectives: past-present-future;
3. *Doing* – Intentionally live your purpose and story in daily life toward valued aims;
4. *Self* – Explore, understand, embrace, and care for your authentic self on its developmental path toward improvement and growth;
5. *Others* – Connect and engage with others in mutually healthy, appreciative relationships, and seek and give support and aid." (Steger, 2022, p. 17).

2.3.1 Design Characteristics for Consciousness

MIL interventions to encourage Consciousness should include skills development, increasing awareness of one's knowledge, skills, attitudes, and aspirations, and reflection on and derive meaning from experiences (Heine et al., 2006; George & Park, 2016; Steger et al., 2021). This can be achieved through interventions that are either attention-based, strength-based, affect-based, gratitude-based, relationship-based, or coping-based interventions (Donaldson et al., 2015; Waters & Loton, 2019). Attention-based interventions concern activities such as yoga and stress management programs. Strength-based interventions refer to identifying and practising innate strengths (Coppley & Niemic, 2021). Affect-based interventions included writing about positive emotions (Donaldson et al., 2015). Gratitude-based interventions are writing exercises such as writing a gratitude letter. Relationship-based interventions concerned positive interactions with students and teachers. Coping-based interventions included classes to broaden students' range of successful coping methods and deter detrimental coping strategies. Research has shown that these interventions yield various direct and indirect effects on adolescents' academic achievement and well-being (see systematic reviews of Donaldson et al., 2015; Waters & Loton, 2019). The preceding suggests that MIL interventions should

offer adolescents opportunities to become aware of and develop various cognitive, emotional, and behavioural capabilities.

A purpose stems from the consciousness of one's framework (Koshy & Mariano, 2011). Adolescents' meaning-making promotes purpose development and, in turn, further contributes to one's consciousness (McKnight & Kashdan, 2009). In existing interventions (Bronk et al., 2019; Kosine et al., 2008; Schippers et al., 2015; Schippers & Ziegler, 2019), meaning-making to set self-concordant goals is achieved through identity formation by describing values, passions, current and desired competencies, and habits, promotion of self-efficacy and metacognition, and exploring cultures. The preceding suggests that MIL interventions should support adolescents in becoming aware of themselves and have a purpose that capitalises on personal interests and values.

Consciousness can also be promoted through evaluating activities, which fosters a sense of significance (Steger, 2009). Taking time to reflect and evaluate to discern what adolescents experience as significant can be conducted after completing exercises related to coherence or purpose (Steger et al., 2021). As adolescents become increasingly aware of their capabilities, they gain more understanding of themselves and can derive value from that insight ('t Mannetje, 2023). The preceding suggests that MIL interventions should help adolescents to assign value to their capabilities.

In sum, Consciousness is suggested to be promoted when adolescents become aware of and develop their capabilities. The meaning-making process provides a basis for purpose and feelings of significance as students become aware of the value of their capabilities.

2.3.2 Design Characteristics for Time

MIL interventions are suggested to include activities in which adolescents utilise different time frames to promote coherence, purpose, and significance. For example, in the intervention applied by Schippers et al. (2015), adolescents were guided to create images of their current and future lives. These supported adolescents in forming a coherent picture of their development through multiple life stages. In addition, Shin and Steger (2014) described several activities, such as a growth-oriented narrative, that inspire activities for purpose and significance. For example, adolescents might gain insight into their past commitments and their current and future commitments to promote their sense of purpose. Similarly, significance exercises might identify aspects that signified for them in the past, present, and future.

2.3.3 Design Characteristics for Doing

MIL interventions to encourage Doing should support adolescents in developing action plans and executing these plans, as this stimulates their academic performance, self-efficacy, and

motivation (Duckworth et al., 2023; Morisano et al., 2010; Waters & Loton, 2019; Yeager & Bundick, 2009). An effective goal-setting intervention promotes the connection between specific subgoals to broader, overarching goals and, similarly, immediate subgoals to their more distant counterparts (Locke & Latham, 2006; Schippers et al., 2015). Students who described specific and detailed goals compared to a control group significantly improved their grade point average (Morisano et al., 2010). In addition, students' academic performance was enhanced when they set proximal and distal goals compared to students who only set distal goals (Locke & Latham, 2006). The preceding suggests that MIL interventions should help adolescents structure short-, mid-, and long-term goals.

A second condition is that goals must be balanced, sufficiently challenging to spark the desire for achievement, yet not so complex that failure becomes likely (Locke & Latham, 2002). The intervention of Schippers et al. (2015) assisted adolescents in preventing goal conflicts and evaluating the feasibility and achievability of their goals. Adolescents were tasked to develop "if-then" strategies to address possible hurdles and guided to formulate strategies for assessing and tracking their progress towards goals (Schippers & Ziegler, 2019). In addition, self-regulation design principles for students recommended mastering self-regulation through a step-by-step approach (‘t Mannetje, 2023). The preceding suggests that MIL interventions should help adolescents develop feasible goals, implementation plans, and ways to evaluate and monitor their progress.

Furthermore, interventions should create opportunities in a curriculum for adolescents to follow through on their purpose (Koshy & Mariano, 2011). A prominent feature is offering sustained engagement with purpose-related curricula, moving away from one-time or single-classroom approaches (Koshy & Mariano, 2011; Schippers & Ziegler, 2019; Mannetje, 2023). Learning environments in curricula should stimulate adolescents’ purpose by providing opportunities for responsibility-taking, decision-making, and altruistic behaviours, as well as participating in local community-based activities, learning communities, and service-learning (Koshy & Mariano, 2011; Shamah, 2011; Van den Berg, 2023). To take effect, topics in these authentic learning environments must cohere with adolescents’ interests (Koshy & Mariano, 2011). The preceding suggests that MIL interventions should be part of curricula for longer and offer opportunities for adolescents to execute their goals in authentic environments.

Participating in authentic learning environments increases the chance of adolescents to experience a sense of significance (Flett et al., 2019; Hart et al., 2007). By working in authentic learning environments on challenges (Koshy & Mariano, 2011; Van den Berg, 2023), delivering output for these challenges (Van den Berg, 2023; Ward & King, 2017; Yeager & Bundick, 2009), and evaluating one’s contributions to the goal of authentic learning environments (Steger et al., 2021). Especially when the goal of the learning environment coheres with one’s purpose, as monitoring one’s progress towards one’s purpose could render a sense of significance (Martela & Steger, 2016).

The preceding suggests that MIL interventions should offer adolescents opportunities to evaluate their contributions to learning environments.

In sum, Doing is suggested to be promoted when adolescents develop hierarchies of goals and suitable goals and strategies and have opportunities to execute these goals. Evaluating their contributions to learning environments yields significance.

2.3.4 Design Characteristics for Self

Several interventions can be utilised to encourage Self among adolescents. Van den Berg (2023) described the importance of providing opportunities to connect personal aspirations and interests with topics in the learning environment. A way to promote adolescents' exploration is to provide them with responsibilities (Shamah, 2011; 't Mannetje, 2023) and roles and parts of the program to facilitate ('t Mannetje, 2023). The preceding suggests that MIL interventions invite adolescents to take responsibility by providing them with roles and parts of the program.

Adolescents' purpose development can be supported by promoting autonomy (Weinstein et al., 2012). Scholars identified behaviours in teacher-student interactions that encourage the autonomy of students (Chang et al., 2017; Reeve, 2012; Reeve & Cheon, 2014; 2020; Reeve et al., 2018). For example, teachers could offer students options to consider, provide prompts rather than giving direct answers, demonstrate patience for learning at their own pace, acknowledge students' feelings, take on students' viewpoints and provide time for discovery. A teacher should demonstrate these behaviours while considering individuals' circumstances, potential, and challenges (Wehmeyer et al., 2021). The preceding suggests that MIL interventions should promote students' autonomy through specific teacher behaviours.

The emphasis on adolescents' autonomy and contributions in a learning environment demonstrates that adolescents' contributions are essential, which increases the chances that adolescents feel significance (Flett et al., 2019; Tinto, 2017). In addition, teacher behaviours such as taking an interest and personal encouragement can also contribute to a sense of significance (Flett et al., 2019; Whitten et al., 2017). Furthermore, monitoring one's personal development can provide significance if evaluated during the program (Steger et al., 2021; 't Mannetje, 2023). The preceding suggests that MIL interventions should promote personal encouragement and opportunities for evaluation during the program.

In sum, Self is suggested to be promoted when adolescents take on responsibilities in the program, are supported in their autonomy, are encouraged by teachers, and evaluate their progress during the program.

2.3.5 Design Characteristics for Others

MIL interventions are suggested to encourage adolescents to connect and engage with others in appreciative relationships and supportive environments to provide individual and collaborative learning opportunities in different educational settings (Lund et al., 2003; ‘t Mannetje, 2023). Literature suggests that coherence can only partly be developed through self-learning and should preferably be guided by parents, teachers, and others (Shin & Steger, 2014; Steger et al., 2021). In learning environments, adolescents can often connect with other stakeholders who work on similar purposes (Van den Berg, 2023). The preceding suggests that MIL interventions should include individual and collaborative learning opportunities and bring adolescents into contact with others.

A shared learning environment enables adolescents to involve others in their learning process and encourages others to stay motivated (Lund et al., 2023; ‘t Mannetje, 2023; Yeager et al., 2012). This may be especially important when adolescents monitor their progress towards their goals as they share their setbacks and successes. Van den Berg (2023) described the necessity of adolescents and teachers to push one another to accelerate their personal development. For adolescents to be able to help one another, they must know what others want to achieve. In the intervention of Schippers et al. (2015), participants were required to create and publicly declare a concise overarching goal statement, leveraging social pressure to enhance goal dedication. The preceding suggests that MIL interventions should allow adolescents to collaborate in monitoring their progress and to publicly address their desired achievements so that others know what they want to achieve.

The opportunities to learn collaboratively increase the chance of adolescents experiencing significance (Flett et al., 2019; Lambert et al., 2013; Steger et al., 2021; Van Tongeren et al., 2017). In addition, students’ roles that contribute to the development of other students may increase feelings of significance, for example, by mentoring a junior student (Yuliawati et al., 2023). Volunteering in such roles is associated with a higher sense of significance (Piliavin & Siegl, 2007). It would aid the mentee's growth and contribute to the mentor’s development and sense of significance (Yomtov et al., 2017). The preceding suggests that MIL interventions should provide adolescents with opportunities to learn collaboratively and contribute to the development of other students.

In sum, Others is suggested to be promoted when adolescents work on individual and collaborative tasks, interact with others, share successes, setbacks, and desired achievements, and have roles that contribute to the development of other students.

2.3.6 A Design Characteristics Framework for Meaning in Life Interventions in Higher Education

To conclude, this theoretical framework yielded insight into the concepts of coherence, purpose, and significance and their mutual relationships as dimensions of MIL (Martela & Steger,

2023). The presence of MIL yields various benefits for adolescents. However, attaining these may require clarification for students (Steger, 2009; Ratner et al., 2019). Structured interventions are needed in higher education to support students (Schippers & Ziegler, 2019). Based on the literature, the first step was establishing design characteristics from an integrative perspective. Design characteristics were theorised for teachers to increase the likelihood of students experiencing MIL during class, as shown in Table 1. These design characteristics are categorised into the five categories Consciousness, Time, Doing, Self and Others based on the themes of Steger (2022) and per dimension (i.e., coherence, purpose, and significance). Because these characteristics are based on theory, it still needs to be clarified whether this categorisation is reflected in practice. An expectation for each dimension is described.

First, the coherence characteristics are expected to be prevalent in Consciousness and Others. Consciousness deals with the meaning-making process, which ties closely with the goal of coherence. For instance, in Consciousness, adolescents may learn tools to structure daily experiences to extract meaning from them (Steger, 2009). In the case of Others, coherence is preferred to be developed in conjunction with others (Shin & Steer, 2014) and Dutch higher education is often provided in group settings. As such, it is expected that the category of Others will play a pivotal role in promoting the coherence of adolescents.

Second, the purpose characteristics are expected to be prevalent in the Doing, Self, and Others. Doing refers to making feasible plans to execute goals towards one's purpose. As purpose determines an overarching objective and necessitates a hierarchy of goals (Damon et al., 2003), characteristics in the category of Doing provide an aligned and concrete expression to this dimension. In the case of Self, the purpose is an individual overarching life mission, so the individual focus of fostering one's autonomy and helping adolescents on their development path seems fitting to pursuing a personal life mission. Adolescents' work towards their purpose often involves others (Van den Berg, 2023). Thus, the Others category is also expected to be prevalent.

Third, the significance characteristics are expected to be prevalent in Consciousness, Self, and Others. As Consciousness provides tools to make meaning, one of the tools which may be developed could be aimed at adolescents assigning value to their capabilities to experience significance ('t Mannetje, 2023). To do so, students probably will evaluate and reflect on experiences to recognise that they are valuable, a characteristic part of Self. It is also plausible that adolescents encourage each other and may get encouraged by teachers. Such a collaborative learning activity is a characteristic of both Self and Others.

Table 1

Design characteristics for meaning in life interventions in higher education

	Consciousness	Time	Doing	Self	Others
Coherence	- include opportunities to become aware of one's cognitive, emotional, and behavioural capabilities - include opportunities to develop of one's cognitive, emotional, and behavioural capabilities	- include reflecting on and connecting past, present, and/or future experiences		- include opportunities for responsibility-taking in the program	- include individual learning opportunities - include collaborative learning opportunities - bring adolescents into contact with others
Purpose	- support adolescents to develop a (slight) sense of coherence to develop a purpose - develop awareness of one's purpose	- include reflection on commitments in the past, now, and/or what might be in the future	- structure intrinsically motivated short-, mid-, and long-term goals toward this purpose - provide strategies to develop plans - create opportunities for goal execution for a longer period and in authentic learning environments	- promote the autonomy of adolescents	- include opportunities for sharing successes and setbacks - include opportunities for publicly addressing desired achievements
Significance	- promote awareness of the value one's capabilities have	- include reflection on what signifies for them in the past, present and/or future	- include evaluation of contributions to shared goals in authentic learning environments	- include personal encouragement - include evaluation opportunities throughout a program	- include individual learning opportunities (same as coherence) - includes opportunities for participants to take on roles that contribute to the development of fellows

2.4 Research Questions

The purpose of this study is to establish design principles for interventions that encourage students' sense of MIL within higher education. The theoretical framework has identified design characteristics related to coherence, purpose, and significance. However, these require more detailed specifications for practical application in educational settings. Without such specifications, there is a risk that teachers may implement interventions that superficially align with these characteristics but fail to truly contribute to MIL (Nurra & Oyserman, 2018). Consequently, there is a need for further

contextualisation and refinement of the theory-driven design characteristics within the context of Saxion. Particularly, since these characteristics are derived from literature, there is limited understanding of whether their distribution across dimensions aligns with practice. Therefore, design-based research is conducted to refine design characteristics with procedures and arguments and to investigate which characteristics are applicable per dimension. This study contributes to theory by approaching the design of MIL from an integrative lens, determining which design characteristics fit which dimensions, and taking an in-depth look at the interrelationships of the dimensions. The Saxion *Purpose-driven Learning* (PDL) project is supported by gaining a design framework for future initiatives. This resulted in a research question for each of the three phases:

RQ1: How are the design characteristics of meaning in life interventions reflected in the educational practice of the purpose-driven learning project at Saxion?

The design of the PDL project case study is investigated to understand the need for MIL design principles in higher education. This PDL project aimed to develop education—modules, guidance, and learning environments—driven by students' purposes. The research goal is to explore and analyse the current design of MIL interventions in practice and develop design implications for refining the design characteristics in phase two.

RQ2: Which design characteristics should be developed for interventions to encourage students' sense of meaning in life within higher education?

The theoretical framework yielded characteristics for design principles. Based on the inquiry in this phase, design characteristics are further refined with procedures and arguments, and the categories of design characteristics were analysed on their exclusivity to a dimension. The research aims to determine which categories and design characteristics are relevant per dimension.

RQ3: What are expert perspectives on the expected value of the design principles developed in this research to encourage students' sense of meaning in life?

In the third phase, experts evaluate the refined design principles from the previous phase for feasibility and soundness. Based on this inquiry, insights are gathered for future development of the design principles for MIL in higher education. The research goal is to evaluate the soundness and feasibility of the refined design principles.

Each phase of this research answers one of the research questions (e.g., RQ1 in the analysis and exploration phase). This thesis is completed with a discussion and conclusion about implementing the design principles.

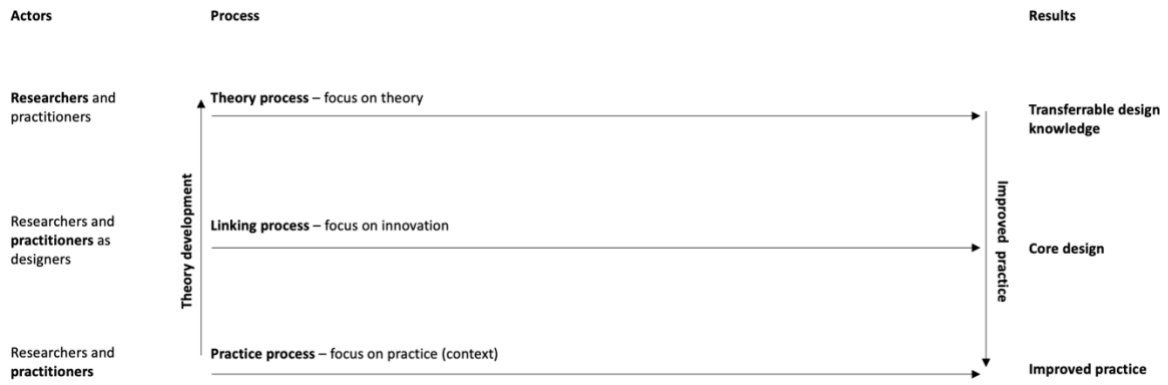
3 Research Design

Design-based research was conducted to create design principles for interventions that encourage students' sense of meaning in life (MIL) in higher education. Design-based research aims to simultaneously develop theoretical understanding and practical solutions transferrable to other contexts (Cremers, 2023; McKenney & Reeves, 2019). The mixed-method research design *field exploration* was used (Van Turnhout & Lusse, 2023). This design develops knowledge for solutions in future research and practice. This study established design principles as the starting point for future educational designs and research.

This study's research design was developed using the three processes model from Cremers & Van Turnhout (2023) and the generic model for educational design research from McKenney & Reeves (2019). The model of Cremers & Van Turnhout (2023) discriminates three processes to develop a design through theory, practice, and linking these two sources, as shown in Figure 1. An opportunity or issue in context is identified in the practice process, and practical knowledge is gathered. The theory process gathers existing knowledge to design a solution for a problem or opportunity. The linking process combines theoretical and practical knowledge to develop suitable solutions.

Figure 1

Three processes model (Cremers & Van Turnhout, 2023)

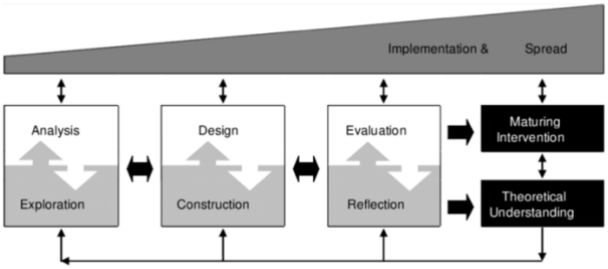


Note. Actors in the lead are in bold. Translated from Cremers & Van Turnhout (2023)

The McKenney & Reeves (2019) model was used to structure the design's developmental process. The model distinguishes three phases in education design research: analysis and exploration, design and construction, and evaluation and reflection (see Figure 2). These three phases correspond with the three strategies *of theory exploration*, *practice exploration*, and *theory validation* deployed in this study's field exploration research design (van Turnhout & Lusse, 2023).

Figure 2

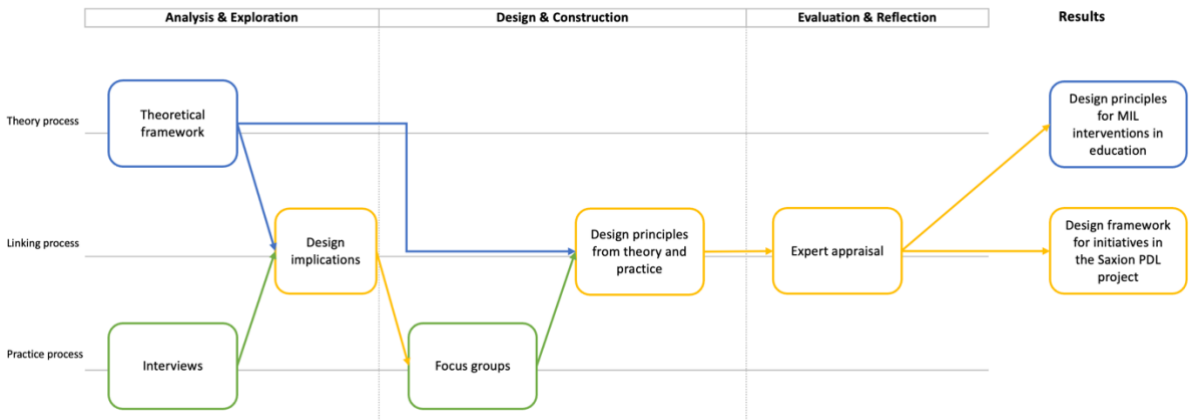
A generic model for conducting design research in education (McKenney & Reeves, 2019)



Activities were ordered for this study using the two models, as shown in Figure 3. In this figure, the phases from the generic model were merged with the three processes model. The generic model provided a specific focus to each phase of the study, while the three processes model showcased through which process information was developed. This offered structure for designing knowledge development activities in different knowledge processes and multiple phases. This was important as this study aimed to develop design principles based on multiple knowledge sources. In the analysis and exploration phase, interviews were conducted to understand the opportunity in context (practice process), and a theoretical framework was constructed to develop design characteristics for MIL in education (theory process). These yield design implications for the next phase (linking process). In the design and construction phase, focus groups were conducted to gather content on procedures and arguments (practice process). The focus group's results were used to further develop and refine the theory-derived design characteristics (linking process). In the final evaluation and reflection phase, an expert appraisal of theoretical and practical knowledge (linking process) was conducted. The methods are explained in detail in the respective chapters.

Figure 3

Overview of activities modelled in processes and phases



4 Analysis & Exploration

The analysis and exploration phase aimed to understand a teacher's, a designer's, and a researcher's perspectives on meaning in life (MIL) in the purpose-driven learning (PDL) project. Interviews were conducted to answer the first research question: "How are the design characteristics of meaning in life interventions reflected in the educational practice of the purpose-driven learning project at Saxion?" Before the description of the method is provided, the context of this study is described.

4.1 Context

The context of this study was the Comenius Leadership Fellow project *Purpose-driven Learning*, which was granted to Saxion's Education Innovation Hub in 2022. This project's initiatives were undertaken and monitored to develop an insert program that encouraged students' sense of MIL. In this study, the first PDL initiative, KANS, was included. This was a ten-week exploration program for students who struggled with finding their purpose; they were in doubt and at risk of dropping out. KANS offered a support system to prevent dropouts and help students make conscious choices where they can enact their purpose. The second initiative was the minor program Conscious Business. In this half-year program, a maximum of 26 students were coached in articulating their purpose and enacting it within a real-life business case. This program had been around longer than the PDL project, and its approach contributed to the project's initial development.

4.2 Method

A perception poll strategy (McKenney & Reeves, 2019) was utilised through semi-structured individual interviews to retrieve perspectives from a teacher, a designer, and a researcher of the PDL project at Saxion. The perception poll ensured that different perspectives were gathered to determine the problem, the needs, and the context of MIL interventions' designs in the PDL project. This was appropriate because there was no written design outline at the start of this study.

4.2.1 Participants

The participants were purposefully selected (Coyne, 1997). The participants included one teacher, one designer, and one researcher. Participants were selected based on their involvement with the PDL project. One project leader, two policy officers, three teachers/coaches, two educational designers and three researchers participated in the project on their own accord and had been involved since the initial grant application. A specific selection of individuals was invited based on their experience. The teacher participated in the set-up, execution, and coordination of the KANS program. The designer developed KANS and executed multiple initiatives within the project. The

researcher studied students' motivational development in KANS (quantitative and qualitative) and monitored other initiatives within the project through a learning history with an educational innovation perspective (qualitative). Participants provided their consent upfront.

4.2.2 Instruments

An interview scheme for a semi-structured individual interview was developed to retrieve the participants' perspectives on the PDL project at Saxion. The interview scheme consisted of 12 main questions on six topics: the problem that PDL tries to solve, defining PDL, articulating the need for PDL, their role in the project, the current state of the project, and the challenges in developing PDL. One of the main questions was: "What do you think is the problem being solved with purpose-driven learning?" Suggestions for follow-up questions were prepared in the interview scheme, such as "How does this problem manifest itself?" The interview scheme is presented in Appendix I.

4.2.3 Procedure

The one-on-one interviews took off with an introduction of the topic, the purpose of this study and a short explanation of the interview topics and questions. Subsequently, the first topic was introduced, and the central question of this topic was introduced. Follow-up questions were asked to ensure answers were elaborated upon and well-understood by the researcher. After that, each topic was introduced with the first main question of the topic, etc. The topics were addressed in the order that they are described above. Each interview lasted approximately 60 minutes.

4.2.4 Data Analysis

The interviews were transcribed verbatim. The transcripts were coded in ATLAS.ti using an inductive approach. First, the transcripts were openly coded. This resulted in 17 codes. These were categorised in the second round based on the structure of the interview scheme: 1) the problem that PDL tries to solve (five codes), 2) the concept of PDL (three codes), 3) the project PDL (five codes), and 4) the development of PDL (four codes). In the third round, four codes were merged with codes in the same category. For example, in the first category, the code 'problem origin' was merged with 'reasons for problem'. In addition, only codes mentioned by all three participants were included in further analysis (six codes were excluded, including the fourth category). This resulted in three categories: 1) the problem that PDL tries to solve (three codes), 2) the concept of PDL (two codes), and 3) the project PDL (two codes) (see Table 2).

The first category contained information about the problem that PDL tried to solve, which was relevant to see if they matched the target group's needs (Leest et al., 2022). Quotations included information related to the problem that PDL tried to solve. The second category contained

information about the central concepts of PDL, which was relevant for comparing concepts from literature to those in practice. Quotations included information related to the conceptualisation of and reasons for PDL. The third category contained information about the execution of the PDL project, which yielded insight into MIL interventions in the project. Quotations included information related to the project execution. The resulting codebook, including examples and frequencies, is presented in Appendix I.

Table 2

Inductive categories and codes of the analysis and exploration phase

Category	Code	Definition
Problem	Problem definition	Problem that PDL tries to solve
	Problem manifestation	Manifestations of the problem in educational context
	Reasons for problem	Reasons for the problem in educational context
Concept	PDL Definition	Core elements of PDL
	Reasons for PDL	Reasons for PDL
Project	Current initiatives	Explanation of current initiatives in the project
	Difference with curricula	Differences between PDL and current curricula

4.3 Results

4.3.1 The issues that Purpose-driven Learning tries to solve

According to the participants, PDL addressed four problems students experience in education. In the designer's view, higher education students acquire knowledge and skills without feeling connected to what they are doing or why they are studying. The designer exemplified this by stating a metaphor: "A student jumps on the trailer and lets himself be carried along by what the education wants from him instead of getting behind the steering wheel." It should be noted that expecting students to take 'the steering wheel' can be seen as optimistic, as the ability to self-regulate is difficult for most adolescents (Luken, 2008). Whether students can self-regulate their learning depends on many factors (De Boer et al., 2012). The designer nuanced his statement that there have been numerous programs to promote more student-oriented education. However, in his view, these have failed to help students find a connection to something bigger than themselves that motivates them.

The researcher articulated a second problem students experience. Based on experience in honours and degree programs, the researcher's colleagues saw high-potential students having difficulties because they could not keep up with the process of education. The researcher explained that degree programs require students to proceed without considering the students' starting points that influence their motivation. Some of the antecedents for motivation lie within students' backgrounds, such as learning challenges, personal traits, and future aspirations, shaping their educational journey. Therefore, the design of the current degree programs may be suited for some

students because they have the motivation or appreciate the structure it provides, she explained. In contrast, for others, the design is less suited. In the search for didactical approaches to different learning needs in class, the researcher expressed the desire for all students to be accommodated.

The coach indicated that after a student has chosen a degree program, it is challenging to switch programs should a student realise another program might fit better with his interest. She believed that many students are not yet self-aware and require others' support to find what is important to them. Her view was that many students question whether their degree program fits their interests after starting with a program and that they choose a (new) degree program without reflecting on what they find attractive. To help students with this question, her view was that they must understand themselves, their passions, their talents, and topics they are curious about to make an intrinsically motivated choice for a degree program. The coach expressed the desire for students to have more time to orientate and degree programs to facilitate this orientation process instead of trying to keep students 'in line', avoiding study delay. It must be noted that this kind of orientation support is available within higher educational institutions through student support services.

In sum, students seem to be experiencing several problems for which PDL aims to provide a solution. The issues a group of students is experiencing in education mentioned by the participants are fourfold: 1) scarcity of connection between students and what they are learning, 2) little attention for where students are at when starting their education, 3) a shortcoming in applying didactical approaches that facilitate diverse learning needs, and 4) a lack of orientation on interests and desires of students in degree programs. To develop design principles, this means considering student-oriented didactical approaches to help students find meaning in their development and connect their interests to education.

4.3.2 The Conceptualisation of Purpose-driven Learning

Participants generally agreed with one another on the core elements and mentioned concepts that seemed to be related to one another. All three mentioned the concept of purpose. The participants regarded purpose as an intrinsically motivating higher-order goal towards something that a student finds essential in the world, which provides meaning to the actions and learning of students and steers their actions to positively impact others and their environment. In addition, the designer and the coach reported that PDL is concerned with kindling students' curiosity and self-learning capabilities through knowing themselves. The three participants stated that underlying PDL is the premise of being of value. The researcher explained that it is essential that students feel they matter due to something they did well, liked to do, and being of added value to others. The designer added: "The basic message is [that] you already have value, and we are going to look together to see what that looks like and how it can be developed further."

According to the designer and the coach, PDL aimed to help students find their purpose that contributes to society and find meaning in their degree programs. The designer and the coach suggested that students are often aware of what is happening in the world and are searching for their place there. Research into the life purposes of higher education students concluded that Dutch students' purposes are mainly self-oriented (Kuusisto et al., 2023), opposing the statements of the designer and coach. The researcher and the coach suggested that PDL supported students in finding their purpose and what kind of education they want to pursue. In the view of the coach, PDL supported students to connect the dots between their skills, interests, goals, needs for learning, and required modules and learning environments.

To help students find a purpose, the designer and the coach believed that students should participate in authentic learning environments aimed at societal issues. The coach explained that PDL requires students to get involved with society and consider what is essential in the world. The coach elaborated that this necessitates the involvement of societal parties and businesses. In her view, students can orient and practice their purpose in PDL before choosing a specific profession: "The cooperation with companies I see as a means to orient yourself about what you are going to do after finishing your degree program." The designer summarised PDL as world-oriented and personal fulfilment-oriented: "How can I find the place where I become happy by contributing something to the world?"

In sum, PDL is related to supporting students by articulating and enacting an intrinsically motivating higher-order goal, gaining a better understanding of themselves and being of value to themselves and others. In PDL, students ought to influence how their degree program is shaped – within current degree programs, students decide upon their internships, minors, and projects – and collaborate within authentic learning environments on societal issues. To develop design principles, attention should be paid to how concepts such as self-awareness and purpose can be encouraged in learning environments.

4.3.3 Purpose-driven Learning Initiatives

The participants explained three initiatives in the purpose-driven learning project. Each of the three initiatives had a specific design and target group. The designs of these initiatives were primarily based on previous experience in honours and degree programs of participants in the PDL project team. The first initiative was KANS (September 2021 - December 2023). KANS was a ten-week extracurricular program for students who doubted proceeding with their degree program. In this program, teachers coached groups of ten to twelve students in weekly meetings, physically getting together and aimed at improving students' self-awareness. It supported students in finding purpose and taking control of their development. This initiative was monitored. The second initiative was the

semester *Meervoudige Waarde* in the Business Administration bachelor (February - July 2023). PDL courses were added to existing courses in the semester. This addition consisted of students participating in a learning community with a business leader and teachers who collaboratively worked on a real-life business case about conscious business. Students learned to understand themselves and their relation towards conscious business and reflected upon their contribution to the collaboration on this topic. This initiative was monitored. The third initiative was an honours programme called iFlourish (September 2023 and onwards). In this extracurricular program, students participate in learning communities and work on sustainable development cases while choosing modules they want to study. In this learning community, students were coached to improve their self-awareness and purpose, work on challenges in the world they find significant and contribute to solutions to these challenges. This program consisted of three years and included weekly meetings.

The designer and the coach agreed that the main difference between purpose-driven learning and existing curricula is the level of prescription. While curricula, in their view, are mainly prescribed, the PDL design is regarded as responsive to individual learning needs. The coach exemplified this by the fact that teachers working in current curricula are bound to content that must be provided in specific weeks. As such, the time for personal development is designated to study career counselling, organised into several hours per quartile in a separate course. In PDL, personal development is integrated into all content. As the designer explained, self-awareness, making choices, and being better able to reflect on one's position in the world direct the content students want to learn. This personal premise underlying the program design reflected what PDL is compared to current curricula in the designer’s view.

A second difference concerned the didactical approaches during class. The researcher mentioned that PDL didactics can be described as a conversation between students and teachers rather than teachers being the experts who present knowledge to students. Both the designer and the coach corroborated this. The designer explained: "Instead of having a program and providing my content frontally, a teacher will establish oneself as an equal partner to students." In the view of the designer and the coach, the interaction with students determines what is being discussed during each session, which can differ from the preparation. As such, the design of a program is adapted to the situation each time, with the learning goal still being pursued. Therefore, the program design is developed as a common thread rather than a set program, so they both stated.

In sum, the PDL initiatives were threefold: a ten-week extracurricular program, an extracurricular honours program, and a course within the semester Meervoudige Waarde of the Business Administration bachelor. Each initiative had its specific focus but also showed similar elements, such as promoting self-awareness, working together in groups, and pursuing goals.

Compared to existing curricula, participants suggested that PDL is more responsive to individual learning needs and uses didactic approaches in which students and teachers are (perceived to be) equal partners. To develop design principles, attention should be paid to describing how teachers can adapt their guidance to fit individual learning needs and communicate with students on an equal basis.

4.4 Discussion of Results

This study's analysis and exploration phase aimed to answer the first research question, “How are the design characteristics of meaning in life interventions reflected in the educational practice of the purpose-driven learning project at Saxion?” The results are discussed in three topics: the issues, conceptualisation, and design characteristics.

4.4.1 Issues related to Reasons for Switching and Dropping Out

The issues that PDL tries to solve are related to preventing students from dropping out and switching. The four problems that participants think a group of students are experiencing are: 1) scarcity of connection between students and what they are learning, 2) little attention to where students are at when starting their education, 3) a shortcoming in applying didactical approaches that facilitate diverse learning needs, and 4) a lack of attention for orientation on interests and desires of students in degree programs. These reasons align with a systematic literature review of Dutch higher education students’ reasons for switching and dropping out in the first 100 days (Leest et al., 2022). Process variables, such as orientation on degree programs, academic and social integration, and design of degree programs, reflect reasons 1, 3 and 4. Reason 2 is reflected by the input variables, such as characteristics, knowledge, skills, and attitudes students already possess. It is important to approach the interpretation of these issues with nuance, as they were not directly assessed by students in this study. Despite this, the results suggest that the problems that PDL tries to solve are related to issues experienced by students who want to drop out or switch programs.

4.4.2 Conceptualisation Purpose-driven Learning related to Meaning in Life

The core elements participants assigned to PDL fit the concept of MIL. The core elements can be separated into three categories. First, PDL refers to understanding one's strengths, interests, and aspirations that kindle curiosity and self-learning capabilities. It aligns with the first dimension, coherence, of MIL. This refers to students making meaning of themselves (Martela & Steger, 2023) and learning about their strengths, things they find meaningful, and their skills. Second, PDL concerns having a purpose, an intrinsically motivating higher-order goal. This aligns with the second dimension, purpose, which refers to a self-concordant, long-term, stable, overarching mission (George & Park,

2016). The higher-order goal mentioned by the participants can be regarded as a mission or high goal in the hierarchy of goals (Damon et al., 2003). Third, PDL relates to being of value. The participants propose in PDL the premise of being of value and the evaluation to understand one's value. This aligns with the third dimension of MIL, significance, which refers to one's evaluation of inherent value in life (Martela & Steger, 2016). This suggests that PDL is aimed at supporting students in a similar way to the operationalisation of MIL.

4.4.3 Design Characteristics in Purpose-driven Learning Design

The findings fit several categories of the theory-derived design characteristics of Consciousness, Time, Doing, Self, and Others (See Paragraph 2.3.6.). First, the first and third initiatives aim to promote students' self-awareness, which fits with the promotion of Consciousness (Steger, 2022). Second, in all three initiatives, students work collaboratively on tasks and in initiatives two and three, this collaboration takes place with teachers and work field professionals. This fits with the promotion of collaboration within the category Others. Third, students strive towards their purpose by working on challenges in initiative three. This fits with the characteristics of Doing. The findings did not address elements related to characteristics in the categories of Time and Self.

4.5 Conclusion of Analysis and Exploration Phase Findings

To conclude, the findings result in different views on the project's rationale, the problem it solves, and how PDL is applied. PDL relies primarily on a vision of what education could look like. This vision does not yet provide practical directions for designing MIL interventions within current education frameworks. The PDL design process seems intuitive rather than based on a design-based approach. Nevertheless, there are some findings related to MIL to answer RQ1 "How are the design characteristics of meaning in life interventions reflected in the educational practice of the purpose-driven learning project at Saxion?" The design characteristics are reflected in the PDL project mainly in students gaining more awareness of themselves and their capabilities (i.e., Consciousness), working collaboratively (i.e., Others), and, in some cases, having a higher-order goal they work towards (i.e., Doing). Even though they emulate elements similar to the design characteristics, it gives the impression that the design of MIL interventions in PDL is in an early stage of development. This emphasises the need for design principles to develop MIL interventions. For the design phase, several design implications are distilled from the interviews.

4.6 Implications for the Development of Design Principles in the Next Phase

Based on the interviews' findings, implications were formulated for refining the design characteristics in the next phase of this study. First, the design principles should provide directions to

promote coherence, purpose, and significance. The results revealed that PDL aims to develop students' awareness, capabilities, and purpose. The premise of ‘being of value’ in education aligns with the concept of significance. Therefore, the three MIL dimensions are included in the next phase of this study.

Second, the design principles should provide detailed information on the construction of interventions. The findings identified some design elements similar to the design characteristics from the literature. However, concluding connections between design elements and categories is difficult as the findings are abstract. The more detailed the design principles are, the better it can be estimated whether future interventions promote MIL. Thus, the design characteristics should be refined with multiple procedures and arguments.

Third, the design principles should provide directions for adapting interventions to students’ learning needs. The results revealed the desire to adapt interventions to meet different students' learning needs, and teacher behaviours were considered significant. Thus, the design principles should entail both didactical approaches and teacher behaviours.

5 Design & Construction

The design and construction phase aimed to develop principles based on theory and practical knowledge. The previous chapter described three design implications: design principles should 1) provide directions to promote coherence, purpose, and significance, 2) entail multiple procedures and have various arguments to refine characteristics, and 3) include both didactical approaches and teacher behaviours. These implications set boundary conditions for developing design principles in this chapter. Focus groups were conducted to gather practical knowledge to refine design characteristics and answer the second research question: “Which design characteristics should be developed for interventions to encourage students' sense of meaning in life within higher education?”

5.1 Method

Focus group interviews were conducted to gather data about educational interventions promoting meaning in life (MIL) and generating input for design principles (Baarda et al., 2018). Focus groups offered the opportunity to generate data by discussing topics with participants with different perspectives fitting to the educational practice context of this research (Herrington & Reeves, 2011; Könings et al., 2014).

5.1.1 Participants

Two focus group interviews were executed. The participants were purposefully selected (Coyne, 1997). The teacher teams of KANS and Conscious Business were approached directly. The focus group of KANS consisted of four teachers and a student assistant (a former KANS student). The focus of Conscious Business consisted of three teachers and one student. KANS was a ten-week self-awareness program, while Conscious Business was a half-year minor program (see 4.1). The interviews were conducted in Dutch, and participants provided their consent upfront.

5.1.2 Instruments

Semi-structured interview schemes for two focus group sessions were prepared. The main aim of the focus group was to gather data on current practices of MIL in higher education as input for procedures and arguments of the design principles’ characteristics. The interview scheme for session one consisted of three topics: coherence, purpose, and significance, and two main questions: “How do you interpret the presented definition of [dimension]?” and “What do students do when they practice [dimension]?” The interview scheme for the second session consisted of three topics: coherence, purpose, and significance, and two main questions: “What is an example of an intervention you use to improve [dimension] of students?” Suggestions for follow-up questions for

each main question were prepared in advance, for instance, for session two: “What does this intervention look like?” The interview schemes are presented in Appendix II.

5.1.3 Procedure

For each focus group, two sessions were scheduled. As preparation, the participants received definitions of MIL and its dimensions to read about the concepts before the first session. As done before in the study of ‘t Mannetje (2023) to develop design principles, the first session aimed to explore the concepts and grasp the nuances by discussing practical examples from participants’ work context. Through this, a safe environment for exploration was developed, and a shared understanding of the concepts was developed in preparation for the second session. The first session started with introductions, an outline of the sessions, and the goal for the first session. Then, the definition of MIL derived from literature was introduced and discussed. Participants were asked to respond to the definition and whether it differed from their view. This was followed up by discussing each dimension of MIL one at a time. The definition of the dimension, student examples of the dimension, and how students could develop the dimension were discussed. The first session took approximately 60 minutes.

The second session took place three weeks later. In the three weeks, the researcher summarised the main results from the first session and shared the summary a week before the second session with the participants. This period was considered appropriate since participants could still retrieve the information in their minds from the first session. The second session started with a recap of the first session and the introduction of the second session’s goal: gathering data on current practices of MIL. For each dimension, participants were asked to provide examples of interventions from their practice to develop the dimensions of MIL. Examples were discussed in detail. The researcher asked for details about the characteristics, procedures, and arguments of such intervention. Participants mainly complemented each other’s examples and arguments, which yielded more discussion. The second session took approximately 70 minutes.

5.1.4 Data Analysis

After the focus group interviews were completed, transcripts of the second session were prepared verbatim. The transcription of the first session was excluded from the analysis since it did not yield data to answer the research question. Deductive coding was applied using the design components (Van den Akker, 1999), the dimensions (i.e., coherence, purpose, or significance), and content-related codes (i.e., theory-derived design characteristics, see paragraph 2.3.6) through ATLAS.ti in three rounds.

In the first round, coding based on draft coding schemes of the three types of codes was compared in two sessions to the coding executed by an experienced second coder (PhD level). The coding schemes were discussed in the first session, including the order of codes and the coding process. The researcher and the second coder coded eleven text samples from the KANS transcript between sessions. In the second session, 46 quotations were compared. Coding between the researcher and the second coder showed agreement on 38 (82%) dimension-component codes and 40 (87%) content-related codes. This led to the establishment of a definite coding scheme.

In the second round, the data was coded to assign the components of design principles (Van den Akker, 1999) and the dimensions (i.e., coherence, purpose, or significance). One code consisted of a design component and a dimension (e.g., Coherence Procedure). The design components were either characteristic, procedure, or argument. Characteristic was only coded when substantive information and emphasis for an intervention was provided which was not already part of the theory-derived design characteristics (see paragraph 2.3.6). Procedure was coded when procedural information for a theory-derived characteristic was provided. If content was mentioned in both focus groups but not in the theory-derived design characteristics, it was considered important to include. It was coded as a characteristic and a procedure (see third round). Argument was coded when an argument was provided of a characteristic. When a quotation referred to people making sense of their identity, capabilities, worldview and developing capabilities, it received the code ‘coherence’; people working, monitoring, and evaluating their progress towards their purpose, it received the code ‘purpose’; people evaluating and experiencing their personal value, it received the code ‘significance’. Extensive work was done to avoid double coding in this round as much as possible.

All quotations from the second round received content-related codes in the third round. As shown in Table 3, 21 content-related codes were provided by the theory-derived design characteristics, categorised by Consciousness, Time, Doing, Self, and Others. In this round, one extra content-related code was added, ‘includes teachers as role models’ in the category Others, as both focus groups considered this essential. Double coding was applied because 1) citing specifically for one code was difficult without losing the quotation's context, and 2) content-related codes often overlapped and were layered. For example, having a shared evaluative dialogue was both an ‘evaluation opportunity’ and a ‘collaborative learning opportunity’. All double codes were discussed with the second coder (including those in the second round). In addition, doubts about specific codes were discussed with the second coder until an agreement was reached. Then, the first researcher reiterated and finalised the coding process. The codebook as a result of this process is presented in Appendix II, including descriptions and frequencies of the codes.

Table 3

Content-related codes from the theory-derived design characteristics

Category	Code
Conscious-ness	Develops cognitive, emotional, and behavioural capabilities
	Promotes awareness of existing cognitive, emotional, and behavioural capabilities
	Promotes awareness of the value one's capabilities have
	Promotes awareness of one's purpose
Time	Stimulates reflecting on and connecting past, present, and/or future experiences
	Stimulates understanding of commitments in the past, now, and/or what might be in the future
	Stimulates understanding of what signifies for them in the past, present and/or future
Doing	Structures intrinsically motivated short-, mid-, and long-term goals
	Provides strategies to develop plans
	Creates opportunities for goal execution for a longer period and in authentic learning environments
	Provides evaluation of contributions to shared goals in authentic learning environments
Self	Provides opportunities for responsibility-taking in the program
	Promotes autonomy of participants
	Includes personal encouragement
	Provides evaluation opportunities
Others	Includes individual learning opportunities
	Includes collaborative learning opportunities
	Brings participants into contact with others
	Includes opportunities for sharing successes and setbacks
	Includes opportunities for publicly addressing desired achievements
	Includes opportunities for participants to take on roles that contribute to the development of fellows
	Includes teachers as role models

After coding the data, the researcher clustered the quotations per dimension-component and content-related codes. Procedure and argument quotations were organised in each cluster based on their familiarity. Based on this organisation, descriptions of procedures and arguments were formulated. Descriptions were only included when mentioned in both focus groups, and at least two participants supported the description in the data. In case multiple descriptions of procedures were provided as one subset, these were provided in the data set as integrative procedures. After the initial descriptions, each was reviewed and tracked via colour coding. Table 4 shows an example of a design principle description.

In most cases, the descriptions of procedures and arguments were respectively based on the information coded as a procedure or argument. However, information was not always present. Often, procedure quotations included information for arguments as well and vice versa. This information was utilised in cases where characteristics yielded only procedural data. For one argument, extracting a description from the data was still impossible. In that case, the argument was based on logical thinking and similar arguments in the other dimensions.

After finishing the first overview of the design principles per dimension, similar descriptions of procedures and arguments were identified. As these similar descriptions are part of different

dimensions and categories (i.e., Consciousness, Time, etc.), no descriptions were omitted. Subsequently, the framework was refined through multiple steps for more rigorous and reliable design principles to ensure that design principles are practical and comprehensible.

Table 4

Example of the formulation of procedure and argument for the purpose characteristic *provides strategies to develop plans*

Excerpts	**Resulted in design principle**
Passage 1 - KANS Interviewer: And you do those forward the action and you also come back to that? R4: Yes. Interviewer: And how do you shape that? Is that individually? Or is that in groups? R2: In the group. **Excerpt 2 - KANS** R3: But they were always instructed in the first place, when you come into the next session that you can recall what happened there. Revisit for a moment. And that you can look ahead to where we want to go. **Passage 3 – Conscious Business** Interviewer: And how do you monitor their process, or do you do that at all, do you monitor that [...] R3: Yes, that will show now of course, we can't say much about that right now. But we see them every Wednesday and Friday. So that's the opportunity to, that they approach us and ask for feedback. So they pick that up from us, on those days. **Excerpt 4 – Conscious Business** R3: But yes, concretely in the end, one group is in contact with, but nothing clear yet, huh. And then you also have to start the conversation guys, when do we think we have that, when do we think we have something on paper by then. Yes, you try that too. And together we also come up with a deadline. **Passage 5 – Conscious Business** R2: And that's always different too. Some groups just go. No disrespect to you, but [...] R4: That one was right. R2: [...] sometimes that's, they go and sometimes, maybe it's because of the weather, I don't know. It is constantly probing and checking, but occasionally then you go back, next week you should have a company, we'll agree on that and we'll go and see on Wednesday, hopefully.	… by monitoring progress, as this is input for new steps to take, to prevent students from stagnating and keep them on track

Note. R stands for 'respondent'; the number stands for the respondent's coding figure.

5.2 Results

Tables 5 to 7 show the design principles for interventions to encourage students' sense of MIL within higher education. In each table, design principles are provided for one dimension (either coherence, purpose, or significance) and the characteristics are ordered per category (i.e., Consciousness, Time, Doing, Self, and Others). The characteristics are elaborated by one or more procedures and one or more arguments. 14 out of 22 theory-derived characteristics were used in at least one dimension. One additional characteristic derived from the data is that teachers are included *as role models.*

5.2.1 Similarities between Design Characteristics

Design characteristics of Consciousness, Self and Others were formulated in the three dimensions. For example, promoting students' autonomy and including collaborative learning opportunities are recommended to encourage each dimension. Although procedures and arguments for these characteristics seemed similar, they had a specific emphasis per dimension. To illustrate, opportunities for collaborative learning relate in coherence to taking enough time to discuss topics, in purpose to work together on shared assignments, and in the three dimensions sharing ideas and suggestions. Procedures and arguments thus differed per dimension despite having the same characteristics or from the same category (e.g., Consciousness).

5.2.2 Differences between Design Principles

The different emphases for each dimension became more apparent when examining the differences between dimensions. First, the design principles of coherence were prevalent in Consciousness, Self, and Others, while none were found in Time and Doing. Second, the design principles of purpose were prevalent in Consciousness, Doing, Self, and Others. Third, the significance design principles were prevalent in Self and Others, while none were found in Time and Doing. Recommended characteristics per dimension thus differed despite some overlap in characteristics between the dimensions.

Table 5

Design principles for the Coherence dimension

If you want to design **an intervention to develop adolescents' coherence**, then it is recommended that the intervention…

Characteristic	Procedure	Argument
Category: Consciousness		
Promotes awareness of existing cognitive, emotional, and behavioural capabilities	By providing opportunities for students to get to know one another thoroughly	So that they dare to open up and share what they experience
	By providing theories, guest lectures, and assignments that stimulate students to observe and think about their coherence	So that students become aware of what is important to them, who is important to them, what they find interesting, what they want to achieve, etc.
	Through activities that make students think about their own (counterproductive) thoughts	So they learn that their thoughts influence their behaviours So they learn that their thoughts can limit their success
	Through producing virtual or physical artefacts that symbolises one's identity, such as a magazine or a journal	So that students can use their artefacts in future assignments to reflect upon
	Through processing and discussing insights together with classmates	So that students know that other students have similar challenges Because the third-person-perspective helps students to rethink their views and opinions (about themselves) So that students can help and empower one another
Promotes awareness of one's purpose	Through activities that help students to form an idea or picture about their future	So that students are stimulated to think about what they desire
Category: Self		
Promotes autonomy of participants	By teachers approaching students appreciatively By teachers questioning behaviours and thoughts of students	So that students feel safe to share their thoughts about their success or perceived failure
	By helping students to take initiative	So that students who find taking initiative hard can share their need for help and teachers can adjust their guidance to their needs
Provides evaluation opportunities throughout the program	After shared activities with multiple students As a reflective dialogue Through journaling Or a combination of writing and sharing insights	To help students actively process their experience – and the information they gained - to formulate insights So that students question each other
Category: Others		
Includes individual learning opportunities	Through assignments that require student to process theories and/or experiences and reflect on their meaning for themselves	So that students take time to view (an aspect of) themselves more closely Allowing teachers to adapt their guidance to each individual student to deepen students' insights into themselves

Characteristic	Procedure	Argument
Includes collaborative learning opportunities	By taking time to discuss topics and issues that arise thoroughly	So students do not feel they have to rush or skip their contribution because the program should continue
	Through which students share their thoughts, ideas, views, and insights about an (previous) assignment Allowing students to use other students as a sounding board	So that students discuss various views, review their perspective and might eventually change their view
	In which students work together in exercises or on assignments	So that students might be confronted with their own behaviours and thoughts when they need to rely on others
	In which students support each other by questioning behaviours and thoughts, point out positive aspects and things to develop, and share what they notice about each other	So that students develop a dynamic in which they feel safe to share their view Because others see things about a student that one cannot see for oneself
Includes teachers as role models	By providing examples of experiences from the teacher's life	To normalise sharing difficult and/or meaningful experiences So that a sense of equality develops between teachers and students

Table 6

Design principles for the Purpose dimension

If you want to design **an intervention to develop adolescents' purpose**, then it is recommended that the intervention…

Characteristic	Procedure	Argument
Category: Consciousness		
Develops cognitive, emotional, and behavioural capabilities	Such as resilience, goal setting, and planning skills	So that students learn how to deal with failures and persevere Because this will be expected of students when working in a professional setting
Promotes awareness of existing cognitive, emotional, and behavioural capabilities	By students following up on the things they are curious about	So that students take action
Category: Doing		
Structures intrinsically motivated short-, mid-, and long-term goals	By giving students assignments to set short term goals towards things they are curious about	So that students experience what it is like to achieve a goal that they consider important

Characteristic	Procedure	Argument
Provides strategies to develop plans	By challenging students to follow their curiosity by formulating their next steps	So that students turn their curiosity into action
	With the support of teachers With the support of other students	So that students feel supported in formulating small steps So that students feel more comfortable in taking steps
	By developing an action plan using tools, such as models and frameworks for action plans By formulating small steps to take	So that students make their plans practical So that students get an overview of what they need and who supports them
	By monitoring progress, as this is input for new steps to take	To prevent students from stagnating and keep them on track
Category: Self		
Promotes autonomy of participants	By teachers questioning students about their plans, steps they are taking, and requirements for their plans	So that students are supported in their thinking processes So that students are supported in making plans practical
Provides evaluation opportunities throughout the program	By providing shared monitoring activities On a frequently basis; weekly or biweekly	So that students continuously reflect on their development and what they are working towards So that students encourage one another and provide suggestions for future directions
Category: Others		
Includes individual learning opportunities	In which students execute assignments that require them to think about their progress, their action plans, and their next steps	So that students become aware of their development and how to proceed
Includes collaborative learning opportunities	Through activities in which students cooperate on individual assignments	So that students provide each other with suggestions for future directions
Brings participants into contact with others	By challenging student to get in touch with persons of interest	So that students explore new avenues of thinking about their purpose
Includes opportunities for sharing successes and setbacks	By taking time for sharing successes and setbacks in monitoring activities	So that students review meaningful experiences towards their goals So that teachers can adjust their support to students' needs

Table 7

Design principles for the Significance dimension

If you want to design **an intervention to develop adolescents' significance**, then it is recommended that the intervention…		
Characteristic	**Procedure**	**Argument**
Category: Consciousness		
Promotes awareness of the value one's capabilities have	Through activities in which students get to know what they are good at and how they can contribute to others	So that students become better at estimating what and how they can contribute So that students feel more self-worth
Category: Self		
Promotes autonomy of participants	Through the procedures of coherence and purpose By teachers approaching students appreciatively	So that students make choices consciously fitting with the perception of themselves
Includes personal encouragement	Through teachers having interactions with students in-between activities and exercises. For example, when walking from location A to location B	So that teachers shortly give individual students attention and highlight specific aspects
Category: Others		
Includes collaborative learning opportunities	Through which students share their thoughts, ideas, views, and insights about each other Allowing students to use other students as a sounding board	So that students can support each other and attribute value to each other So that student feel that others take time for, and pay attention to, them
Includes opportunities for sharing successes and setbacks	Through activities in which students' individual development gets spotlighted	So that students individual success – regardless of size, length, or broadness - is made apparent, emphasised, and applauded

5.3 Discussion of Results

This study's design and construction phase aimed to answer the second research question, "Which design characteristics should be developed for interventions to encourage students' sense of meaning in life within higher education?" Based on data gathered from two focus groups, design principles were formulated for coherence, purpose, and significance. These design principles consist of characteristics primarily gathered from theory and specified in procedures and arguments using the data. Only categories with at least two characteristics in a dimension are discussed. Although the design principles of each dimension differ due to their focus, two characteristics were identified in each dimension: 1) promotion of autonomy and 2) collaborative learning opportunities. The procedures and arguments differed for these overarching characteristics. In addition, four characteristics were found in two dimensions. In Table 8, an overview is provided.

5.3.1 Overarching Characteristics

Two characteristics that cover three dimensions were identified in the data. First, the characteristic *promotion of autonomy* (Self) corroborates evidence that specific teacher behaviours

support students' autonomy (Wehmeyer et al., 2021). In each dimension, teachers play a pivotal role in helping students in their thinking process about their sense of MIL. For example, teachers support students to process an exercise by sharing their observations and questioning them, which prompts students to interpret their behaviours. This is similar to the support for making meaning in the intervention of Schippers and Ziegler (2019). In addition, behaviours described in the design principles seem to cohere with teachers' behaviours in literature to promote autonomy (Chang et al., 2017; Wehmeyer et al., 2021). The design principles thus emphasise the importance of the role of the teacher in promoting MIL.

Second, the characteristic *collaborative learning opportunities* (Others) corroborates evidence for encouraging the sense of MIL. It is well-established that being a part of a community and collaboratively working promotes MIL (Flett et al., 2019; Koshy & Mariano, 2011; Lambert et al., 2013). Engaging in collaborative activities fosters connections with fellow students and enhances a sense of social belonging (Tinto, 2003). The significance design principles fit with this idea, as they recommend that students make sure each feels that others take time for them. In the case of coherence and purpose, collaborative learning is mainly aimed at deploying others as a sounding board to gain insights into oneself, sharing ideas on directions, and collaborating on tasks. Here, collaboration enhances the individual exploration of MIL (Shin & Steger, 2014; Steger et al., 2021). The sense of MIL thus seems to be promoted through social belonging and collaboration.

Table 8

Presence of design characteristics in meaning in life dimensions

Cat.	Characteristic	Coherence	Purpose	Significance
Consciousness	Develops cognitive, emotional, and behavioural capabilities		■	
	Promotes awareness of existing cognitive, emotional, and behavioural capabilities	■	■	
	Promotes awareness of the value one's capabilities have			■
	Promotes awareness of one's purpose	■		
Time	Stimulates reflecting on and connecting past, present, and/or future experiences			
	Stimulates understanding of commitments in the past, now, and/or what might be in the future			
	Stimulates understanding of what signifies for them in the past, present and/or future			
Doing	Structures intrinsically motivated short-, mid-, and long-term goals		■	
	Provides strategies to develop plans		■	
	Creates opportunities for goal execution for a longer period and in authentic learning environments			
	Provides evaluation of contributions to shared goals in authentic learning environments			

Cat.	Characteristic	Coherence	Purpose	Significance
Self	Provides opportunities for responsibility-taking in the program			
	Promotes autonomy of participants	■	■	■
	Includes personal encouragement			■
	Provides evaluation opportunities throughout the program	■	■	
Others	Includes individual learning opportunities	■	■	
	Includes collaborative learning opportunities	■	■	■
	Brings participants into contact with others		■	
	Includes opportunities for sharing successes and setbacks		■	■
	Includes opportunities for publicly addressing desired achievements		■	■
	Includes opportunities for participants to take on roles that contribute to the development of fellows			
	Includes teachers as role model	■		

Note. A cell is greyed when a characteristic was present in a dimension.

These overarching characteristics can be the foundation for interventions to increase students' sense of MIL. In addition, the design principles per dimension provide recommendations to specify activities towards the goal of educational interventions. While the design principles for each of the three dimensions have been articulated independently, these dimensions can be integrated into one educational intervention.

5.3.2 Coherence Design Principles

Design principles for coherence were suggested to be prevalent in Consciousness and Others. The results indicate that coherence characteristics were found in Consciousness, Self, and Others. In other words, the findings suggest that students' sense of MIL is mainly promoted through becoming aware of their capabilities, often supported by others, to help students think for themselves, process information, and generate insights. These findings corroborate existing coherence literature. First, the suggestion to use various theories and practices to promote coherence is reflected in the literature (Shin & Steger, 2014; Waters & Loton, 2019). In addition, procedures fit with the variety of activities described in systematic reviews (Donaldson et al., 2015; Waters & Loton, 2019). To illustrate, coping-based interventions are similar to the procedure of *becoming aware of one's (counterproductive) thoughts*. Second, numerous design principles cohere with the idea of supporting coherence development by others in literature (Shin & Steer, 2014; Steger et al., 2021). For example, students collaboratively process experiences to distil insights. In sum, through various guided activities, students gain insights into themselves and develop a coherent life story, increasing their chance of experiencing MIL (Heintzelman & King, 2014).

The finding that coherence design principles were also prevalent in the category of Self might have to do with teachers who support adolescents' information processing. The arguments indicate

that teacher interventions support students in taking action, reflecting, interpreting, and feeling encouraged in their thinking process through specific teacher behaviours or by sharing evaluation opportunities. This support seems helpful in aligning instruction with the needs and identities of each student (‘t Mannetje, 2023).

5.3.3 Purpose Design Principles

Design principles for purpose were suggested to be prevalent in Doing, Self, and Others. The results indicate that purpose characteristics were found in Consciousness, Doing, Self and Others. In other words, the findings suggest that students develop goal-setting skills, work on the purpose by describing plans towards their purpose and putting these into practice, collaborating with fellow students, monitoring their progress, and being supported by teachers and others. These findings corroborate literature which suggests that interventions should help students to develop goal-setting skills (e.g., Schippers & Ziegler, 2019), describe goals that are challenging but achievable (Locke & Latham, 2002), with the help of teachers and stakeholders (Van den Berg, 2023; Wehmeyer et al., 2021), and monitor one’s personal development to increase the likelihood of experiencing MIL (Steger et al., 2021). The finding that purpose principles were also found in the Consciousness category can be explained by the literature's suggestion that meaning-making provides a foundation for determining a suitable purpose (Martela & Steger, 2016; Reker & Wong, 2012). Knowing oneself may help adolescents develop purpose by helping them understand what they find important and what they aim for in life.

A shortcoming of the purpose design principles is that characteristics to promote goal selection (in the Doing category) focus primarily on short-term and proximal goals. This may only allow students to develop a partial range of goals (Damon et al., 2003; George & Park, 2013; 2016). In the findings, activities were not observed to formulate a hierarchy of higher, middle, and lower goals. An explanation for this finding could be that the initiatives observed in this study were an addition to or part of an existing degree program, thus, with little influence on the next steps students take in the degree program (Koshy & Mariano, 2011; Schippers & Ziegler, 2019). Focusing on short-term goals may immediately affect adolescents’ MIL, while the effects of medium-term goals may be uncertain as these are not followed up in (or by others in) the degree program. Although this is a shortcoming, the design principles provide directions to design interventions that support students in grasping their purpose, acting in proximity, and monitoring their progress.

5.3.4 Significance Design Principles

Design principles for significance were suggested to be prevalent in Consciousness, Self, and Others. The results indicate that significance characteristics were prevalent in Self and Others. In

other words, the principles suggest that students discern significance by evaluating their development and being encouraged by teachers and others. This finding builds on existing literature about significance. First, the literature suggests that students may discern significance from coherence or purpose activities by evaluating these activities (Steger, 2009; Steger et al., 2021). Second, the findings that characteristics, such as *personal encouragement* and *collaboratively learning,* promote a sense of significance corroborate existing evidence (Flett et al., 2019; Lambert et al., 2013; Whitten et al., 2017). As such, it seems that adolescents' sense of significance can be encouraged by being recognised for their capabilities and working together.

However, significance is more than being appreciated. It also deals with evaluating oneself towards values, expectations, and standards (Martela & Steger, 2016). Evaluation of the criteria of a Conscious Business Professional – in the case of the minor - could render significance when students become aware they are on track to fulfil these criteria (Martela & Steger, 2016). Little to no information was found as to whether this was taking place. This might explain why the Consciousness category was not prevalent for Significance, despite that this category covers tools to make meaning (Steger, 2022). Instead, it seemed that significance was primarily promoted through non-goal-directed significance (Steger et al., 2021), such as students supporting each other and being part of a group. An explanation for this finding might be that teachers in both initiatives described the concept significance as the most challenging and did not deliberately include it in their program design. As 'being part of a group' was considered a central aspect of each program, the teachers unintentionally promoted students' sense of significance.

5.3.5 Absent Characteristics

Eight out of 22 characteristics were not found in the data. Most notably, no Time characteristics were found in the data. This may be because the Time theory-derived characteristics were too specific and did not have rich examples from literature like the other categories to develop suitable characteristics. Some data was yielded in each focus group; however, it was excluded based on inclusion criteria. Another explanation is that, in the case of the Time characteristic for significance, teachers were limited in their familiarity with the concept of significance. Therefore, they did not include specific activities for this matter. The omission of two characteristics (Self and Others categories) related to students taking on roles may be explained as 'students as partners' for educators is a relatively new concept within Dutch higher education (InHolland; McMaster University Library Press; NRO, 2023). Therefore, teachers might not have considered it a valuable characteristic for the program. Data was found for the Others' characteristic of publicly addressing desired achievements in one focus group but was excluded based on inclusion criteria. The two design characteristics in Doing were not observed, which can be explained by the fact that the two contexts

observed had different program durations. KANS was a ten-week program compared to the Conscious Business half-year program. The duration of KANS might have affected their options to include opportunities for long-term goal execution in authentic learning environments. Data was found on this topic in Conscious Business but was excluded due to the inclusion criteria. This is a disappointing factor in the data, as making lasting contributions and mattering in the world are critical to experiencing purpose and significance (George & Park, 2016; Ward & King, 2017; Yeager & Bundick, 2009).

5.4 Conclusion of Design and Construction Phase Findings

To conclude, RQ2 “Which design characteristics should be developed for interventions to encourage students' sense of meaning in life within higher education?” is answered. Consciousness is prevalent for coherence and purpose, Doing for purpose, Self and Others for all three dimensions. The design principles show that each dimension requires a different composition of characteristics, with at least space for students’ autonomy and collaboration opportunities. These principles are the first step in a more extensive iterative process to test and further develop them (Nieveen & Folmer, 2013). In the next phase, the design principles are evaluated.

6 Evaluation & Reflection

In the previous chapters, design principles for meaning in life (MIL) interventions in higher education were developed based on theoretical and practical knowledge. In this chapter, identity development experts evaluate these design principles on their soundness and feasibility. Expert appraisal interviews were conducted to answer the third research question: "What are expert perspectives on the expected value of the design principles developed in this research to encourage students' sense of meaning in life?"

6.1 Method

Qualitative research was conducted to alpha-test the design principles (McKenney & Reeves, 2019). In alpha testing, the soundness and feasibility of design principles are studied. According to McKenney and Reeves (2019), expert appraisals are suited to testing principles that will be used later in designs, as they offer an opportunity to evaluate a design's value and identify overlooked or misunderstood parts before principles are implemented.

6.1.1 Participants

Four experts participated in the appraisal interviews and were purposefully selected (Coyne, 1997). Expert 1 was a design-based researcher who recently developed design principles for interventions that promote personal resources of higher education students' wellbeing. This expert was included because of her expertise in developing design principles for similar concepts in higher education. The other three experts were included because they had knowledge of and experience with developing identity-related concepts in higher educational design. Expert 2 was the director of Impact and Engagement at a Dutch university, responsible for and contributing to research on a life-crafting intervention among forty thousand students. Expert 3 was a professor in transdisciplinary education and innovation processes in higher education and society. His research concerned identity development in multiple educational contexts. Expert 4 was a philosophy and citizenship teacher with 14 years of experience teaching future primary and secondary school teachers in teaching children and adolescents similar concepts (e.g., identity and personal value system). The interview with Expert 2 was in English, while others were in Dutch. Participants provided their consent upfront.

6.1.2 Instruments

A semi-structured interview scheme was prepared. The main aim was to evaluate the design principles' soundness and feasibility to determine necessary improvements. The interview scheme consisted of two main topics: soundness and feasibility. Soundness was discussed for each dimension: coherence, purpose, and significance. Two main questions were posed per dimension: "What is your

perspective on the alignment of the theoretical underpinnings for [dimension] and its design principles?" and "To what extent do you expect these design principles to contribute to [dimension]? Why?". Moreover, the overarching concept of MIL was discussed. As this is the integrative concept of the three dimensions, a question was posed about the alignment between the dimensions and its design principles. In addition, the feasibility of MIL was discussed. Three central questions were posed: "What is your perspective on the applicability of the design principles in the Dutch Higher Education context?", "To what extent do you think the design principles are applicable to teachers in education?", and "What do teachers require to implement these design principles?" In total, ten main questions were posed. Follow-up questions were asked to ensure answers were elaborated upon and well-understood by the researcher. The interview scheme is presented in Appendix III.

6.1.3 Procedure

The expert appraisal interviews started by introducing the research context, the outline, and the interview's goal. Then, the first dimension and its design principles were introduced, and the soundness questions were discussed. After that, each dimension and its design principles were discussed. The dimensions were addressed in the order described in paragraph 6.1.2. Finally, the feasibility of the design principles was discussed. Each interview lasted approximately 50 minutes.

6.1.4 Data Analysis

The interviews were transcribed verbatim. The transcripts were coded in ATLAS.ti using an inductive approach. First, the transcripts were openly coded. This resulted in 27 codes. In the second round, the codes were divided between the segments soundness and feasibility, which are the central concepts in alpha testing (McKenney & Reeves, 2019). The soundness segment included 12 codes containing quotations in which design principles' descriptions were compared to theory and experts' experience. The feasibility segment included 15 codes containing quotations with information about applying the design principles in higher education, including issues and solutions. In the third round, eight codes were merged with codes in the same category. For example, in the feasibility segment, the code 'incentivising teachers' was merged with 'required support for teachers'. In addition, only codes mentioned by at least two participants were included in further analysis (six codes were excluded). In the fourth round, codes in each segment were categorised (see Table 9).

In the soundness segment, codes were divided into two categories: 1) three dimensions (five codes) and 2) significance (one code). The (number of) dimensions (Martela & Steger, 2016) were used as categories because the quotations contained data that either dealt with one dimension or multiple dimensions. The first category included concerns experts expressed about descriptions of design principles of all three dimensions, which yielded insight into general issues in the descriptions.

The second category included experts' concerns about the significance's design principles, which yielded insight into issues related to specifically the significance design principles. In the feasibility segment, codes were divided into 1) students (one code) and 2) teachers (six codes). The reason was that quotations contained statements that either dealt with students or teachers. The first category contained experts' comments on the extent to which students can perform interventions based on the design principles, which provided a sense of whether these design principles apply to students. The second category contained experts' expectations on teachers' application of the design principles and directions to improve the design principles to avoid or overcome issues, which yielded insight into the applicability of the design principles for teachers. The codebook, including examples and frequencies, is presented in Appendix III.

Table 9

Segments and inductive categories and codes of the evaluation and reflection phase

S.	Category	Code	Definition
Soundness	Three dimensions	Descriptions of Procedures	Statements about concerns and ideas for improving procedures' descriptions
		Theoretical distinction	Statements about the theoretical distinction between categories of design principles
		Tool-oriented	Procedures being too tool-oriented and omitting the relationship towards MIL
		Overlap between dimensions	Statements about overlap between the three dimensions
		Practical justification	Comparisons between design principles and practical experiences of experts
	Significance	Concept developing	Comments on the conceptualisation of significance
Feasibility	Students	Applicability for Adolescents	General comments about the applicability of design principles to adolescents
	Teachers	Applicability for Teachers	General comments about the applicability of design principles to teachers
		Capacities of teachers	Comments about (the development of) suitable capacities
		Required support for teachers	Ideas to improve the usage of principles by providing guidance
		Advantages of design principles	Comments about the advantages of these design principles for teachers
		High number of design principles	Comments on number of design principles and ideas to minimise the number
		Framing of design principles	Comments on the framing of the design principles to teachers

6.2 Results

6.2.1 Soundness

A common view amongst experts was that the design principles cohered with their experience in encouraging students' sense of MIL in various educational settings. Experts explicitly stated support for its application in practice, and they elaborated examples of how they designed

principles in their educational programs and provided their rationale for these designs. For example, Expert 3 explained a goal-setting intervention, “We provide suggestions on how to set up a goal but also try to make it a collaborative process. So that it is not an individual exercise but that students can respond to each other in a group.” This was the strongest for coherence and purpose design principles. Although the experts were confident about the practical justification, they were less confident about the theoretical justification due to their lack of experience with the MIL concept. Still, they provided various concerns that should be addressed.

Most concerns were aimed at differences in the abstractness of the procedures’ descriptions. Three experts mentioned that some procedures were clear (such as Doing procedures on purpose), others were too abstract (such as Consciousness procedures on purpose), and some were much like examples, tricks and gimmicks (such as procedures in significance). On the one hand, this offers many directions for teachers to utilise these design principles; on the other hand, it does not provide enough guidance to teachers for designing interventions to influence MIL in their view. Expert 4 argued that the procedures should provide more explicit information on how they contribute to MIL. For example, the expert reviewed the coherence procedure *activities that make students think about their counterproductive thoughts*: "Then I think, oh yes, but counterproductive to what?" Expert 1 alluded to this by questioning the effectiveness of some gimmicky procedures to the dimension(s). Expert 1 also questioned whether the theoretical distinction of the five categories per dimension (i.e., Consciousness, Time, Doing, Self, and Others) and one category between dimensions (i.e., doing in coherence, doing in purpose) help to understand the design principles. For instance, according to Expert 1, many coherence procedures described for Consciousness are similar to those described for Others. The distinctions were considered artificial and hampered the development of the design principles' theory and applicability. Experts 1 and 3 recommended synthesising the procedures as much as possible to minimise the number of design principles and presenting concrete examples from educational practice.

A second concern expressed by three experts was the conceptualisation of significance in education. In their view, what the concept included is somewhat diffuse. Although the experts believed this concept was essential for students, as it influenced a supportive learning environment, evaluating whether the procedures fit the concept was difficult. In the view of Expert 3, significance had more to do with creating a shared supportive culture than artificial actions. Expert 4 addressed the importance of further grasping the concept by introducing the *mattering* concept (Martela & Steger, 2022) as an addition. In this expert’s view, mattering expanded the concept of significance as it highlighted the importance of students experiencing meaning from contributions to societal goals. Expert 1 stated two avenues for further concept development: 1) further grasping the concept or 2) concluding whether it is tolerable to keep the concept more implicit than coherence and purpose.

In sum, the experts viewed the design principles as practically justified and expressed several concerns to improve their soundness. The two concerns were the abstractness of the procedures' descriptions and the conceptualisation of significance. The procedures should be synthesised to improve the design principles, and the conceptualisation of significance in education should be refined.

6.2.2 Feasibility

Feasibility for Students

A common view amongst experts was that the design principles' characteristics and procedures were applicable to students. Two experts emphasised that interventions and teachers' expectations should be adapted to what can be expected of students. As Expert 2 explained, students may let themselves, more than adults, be guided by circumstances, feelings, and short-term gratification and, therefore, find it challenging to develop coherence. Expert 4 pointed out: "But we should not neglect to ask the [coherence] question because otherwise, a student will not gain the necessary insight." Expert 1 added the importance of framing this type of education to students. She explained that MIL may cause resistance from students because, for many students, concepts such as this one are farfetched and require them to think about themselves, which they may not be fond of.

Feasibility for Teachers

A common view amongst experts was that the characteristics and procedures of design principles were feasible for teachers. The experts viewed the improvements described for the soundness of the design principles as a prerequisite for teachers to grasp the design principles better. In addition, the experts provided several suggestions to improve the feasibility of the design principles. First, three experts believed the success of implementing this type of education hinges strongly on teachers' support and capabilities to execute these types of interventions. As Expert 4 described it: "I think we require some kind of toolbox for teachers because we are not trained for this yet." "You can get on with this just fine without necessarily thinking about being involved in significance. That is not necessarily wrong, but you are not contributing to significance presumably", added Expert 1. Second, three experts presented training, co-design, and guidance as measures to help teachers make MIL applicable to their educational practice. In their view, through guidance, teachers can participate in dialogues about their designs and outcomes from practice to better understand what works for them and their students.

According to three experts, the advantages of these design principles were twofold: 1) unravelling complex and elusive concepts, making them more practical and less abstract for teachers;

2) it provided guidelines for encouraging students to experience MIL and gives teachers a framework to see what opportunities they may be missing. The disadvantages of these design principles were twofold: 1) the high number of design principles was mentioned as an issue by two experts because remembering this number of design principles is difficult while designing; 2) the design principles may be experienced as restricting by teachers. Expert 1 recommended avoiding framing these design principles as the holy grail for educational design, instead framing it as *one way* to design educational interventions for specific contexts. Expert 3 warned against loosely framed design principles, as teachers may conclude too quickly that they are already doing it or only take what they think is essential. Expert 3 remarked, "Then you may have to force them to think carefully about their [designs]." In his view, the frame depends on how the design principles should be used and by whom.

In sum, experts indicated that the design principles are feasible for students and teachers. Experts expected several challenges in their implementation, such as teachers' capacities. In addition, experts indicated that they perceive the number of principles and the framing of the design principles as issues. Improving the design principles means reducing the number of principles and clarifying how and by whom these principles should be utilised.

6.3 Discussion of Results

This study's evaluation and reflection phase aimed to answer the third research question, "What are expert perspectives on the expected value of the design principles developed in this research to encourage students to experience meaning in life?" The soundness and feasibility of the design principles were evaluated based on data gathered from four expert appraisal interviews. The experts generally viewed the design principles as practically justified and feasible and provided several concerns that should be addressed. Three concerns impacted the soundness and the feasibility of the design principles: 1) the high number and the descriptions of design principles, 2) the conceptualisation of significance in education, and 3) the framing of design principles.

6.3.1 The High Number and Descriptions of Design Principles

The experts highlighted the high number and the description of procedures. Findings suggest these concerns primarily stem from the abstractness of design principles, as procedures are described as either excessively abstract or superficial and from theoretical distinctions made between dimensions and categories. The concerns related to procedures' descriptions can be attributed to the design structure used in this study (i.e., Van den Akker, 1999), which categorises knowledge into characteristics, procedures, and arguments. However, it reveals little about underlying processes and relationships, which other more complex design methods (e.g., Denyer et al., 2008; Sandoval, 2013)

offer by describing underlying mechanisms that an intervention triggers. Describing mechanisms could lead to a better understanding of how procedures of the same or different dimensions influence each other and help to synthesise the procedures.

An explanation for the theoretical distinctions is that this study relied on the five categories from the psychotherapy field (Steger, 2022) to develop the theory-derived characteristics. Making distinctions may have supported acquiring in-depth information; however, it may, to a lesser extent, conform to the commonly accepted view of design principles. Design principles' literature suggests that sets of design principles should preferably be memorised at once (Cremers, 2023) and contain approximately seven principles (Miller, 1956). In this regard, the experts suggested synthesising principles more abstractly and illustrating them with concrete examples. This ties closely to the breakdown of design principles presented by Kali (2006): meta-principles consisting of practical principles subdivided into specific principles. With each layer, the principles increasingly take on the character of guidelines or directives (Cremers, 2023). This approach may help develop improved design principles more suitable for specific design stages or teachers' needs.

6.3.2 Conceptualisation of Significance in Education

A second concern experts highlighted was the conceptualisation of significance in education. The experts express that its conceptualisation is somewhat diffuse and, therefore, hard to grasp whether procedures fit. A similar issue was discussed in this study's design and construction phase. An explanation might be that the concept received the least attention in research compared to coherence and purpose (George & Park, 2016). In addition, in line with the expert's comments, recent research shows that the boundaries of the significance concept are not readily set (Martela & Steger, 2023). This might complicate the conceptualisation of significance in education. On the other hand, the experts' suggestion that significance is about a supportive learning environment and culture seems to fit the finding that the significance procedure *collaborative learning opportunities* deals with social belonging (Tinto, 2003) (as discussed in design and construction). As such, this study provided practical clues to design significance in education.

6.3.3 Framing of Design Principles

Finally, two experts commented on the importance of framing the design principles regarding how and by whom they should be used. This finding corroborates existing design principles literature. Bakker (2019) suggested that authors should be clear about the nature of their design principles when describing them. Bakker found that design principles are described in multiple ways and that each conveys different types of information. Either a prediction, a criterion, a value, a heuristic advice, a guideline, or a combination of these (e.g., Edelson, 2002; Greeno, 2016; Van den Akker,

1999). To guide future designers of MIL interventions in higher education, the design principles developed in this study require a specific frame. This frame could influence the approach in developing the design principles to reduce the number of design principles and synthesise their descriptions.

6.1 Conclusion of Evaluation and Reflection Phase Findings

To conclude, RQ3 "What are expert perspectives on the expected value of the design principles developed in this research to encourage students' sense of meaning in life?" is answered. The experts viewed the design principles as practically justified and feasible. The soundness and feasibility of the design principles are impeded due to the high number of principles, the conceptualisation of significance, and the framing of design principles. The discussion of the three main concerns revealed explanations for the outcomes and future directions for design principles' development. Subsequently, the first cycle of design-based research into meaning in life design principles is finalised. It offers directions for a more extensive iterative process to refine the design principles for MIL interventions in higher education (Nieveen & Folmer, 2013).

7 Discussion & Conclusion

7.1 Discussion

Meaning in life (MIL) is considered a promising approach to support students who are in doubt about their degree program and are at risk of dropping out at Saxion. Although MIL school-based programs have been studied before (e.g., Dik et al., 2011), the intervention literature lacks clarity on the elements that shape the MIL experience in higher education. Therefore, this design-based study aimed to develop design principles for interventions teachers can utilise in class to encourage students' sense of MIL. Using the generic model from McKenney & Reeves (2019), this research was conducted anticipating the implementation of the design principles.

7.1.1 Meaning in Life Design Principles for Higher Education

The analysis and exploration phase findings show that elements of Purpose-driven Learning (PDL) match the design characteristics of MIL in education (i.e., answer to RQ1). For example, the three PDL initiatives promote students' self-awareness, which matches the characteristics of Consciousness. Nevertheless, the findings also unveil varied interpretations of the rationale behind the PDL project, which could impede the implementation of MIL interventions. Consequently, the PDL project team needs to elucidate their objectives and identify interventions grounded in these principles that can effectively address the issues that students experience.

The design and construction phase findings revealed that characteristics of Consciousness, Self, and Others were found for coherence, Consciousness, Doing, Self and Others for purpose, and Self and Others for significance (i.e., answer to RQ2). The design principles show that each dimension requires different activities, with at least space for students' autonomy and collaboration opportunities in each educational design. Coherence interventions require teacher behaviours and conditions steered towards triggering thinking processes about one's behaviour, capabilities, and thoughts. Purpose interventions require teacher behaviours and conditions steered towards taking the initiative, setting goals, and monitoring progress. Significance interventions require teacher behaviours and conditions steered towards expressing confidence and encouragement. Consequently, multiple dimensions may be addressed when designing MIL interventions based on these design principles.

During the evaluation and reflection phase, experts deemed the design principles practically justified and feasible but recommended refinement by reducing their number, redefining significance, and clarifying the framing of the design principles (i.e., answer to RQ3). The reduction in principles and re-evaluation of significance can be accomplished through an additional design phase (McKenney & Reeves, 2019). The need for the design principles' framing seems to be related to the lack of clarity

about the rationale of the PDL project (as described in the analysis and exploration). The project team determines how the principles should be utilised in the project at Saxion and thus influence the framing of characteristics, procedures, and arguments. Experts also consider that the implementation in collaboration with teachers should be carefully prepared. Therefore, the implementation of the design principles and the role of the teacher is reflected upon.

7.1.2 Meaning in Life Design Principles toward Design and Implementation

Although principles are provided in this research, actual implementation occurs when actors enact the intervention (McKenney & Reeves, 2019). The intervention is then shaped by its users, the context, and how it is introduced. To develop suitable MIL interventions based on the principles, the compatibility of interventions with educational contexts is considered an essential determinant for successful implementation (McKenney & Reeves, 2019). In the case of the envisaged PDL insert program at Saxion, the project team should collaborate with teachers and educational designers of degree programs to shape interventions to match students' preferences (Mangan et al., 2020; Tirri & Kuusisto, 2016) and different components of curricula (e.g., see Spider Web, Van den Akker, 2007). Culture and practices can be analysed in each educational context through, for example, focus groups with teachers and students to support developing suitable interventions ('t Mannetje, 2023). The main challenge in collaboration with teachers is to align their views on education and the necessity for MIL interventions, the rationale of MIL interventions, and MIL's contribution to students' learning (Cents et al., 2024). If not aligned, it can lead teachers to implement MIL interventions without understanding what it is about and what it requires from them or not implementing them. Resulting in students not being as well supported as possible. This thus requires support for teachers to implement MIL interventions.

7.1.3 Support for Teachers to enact Meaning in Life Interventions

The success of intervention implementation depends on the teacher's adoption (Fullan & Pomfret, 1977). Creating genuine adoption is challenging, profound, and intimately individual (Coburn, 2003; Waslander, 2007). Teachers might not initially perceive MIL interventions as compatible with their existing values, practices, and beliefs about education (Fullan & Pomfret, 1977; Zhao et al., 2002). Coburn (2023) proposed that intervention implementation should tackle teachers' beliefs, social interaction norms, and pedagogical principles to achieve enduring impact. In addition, teachers' motives of personal development and inquisitiveness might ignite, yet they cannot uphold their engagement (McKenney & Reeves, 2019). For interventions to surpass experimentation, they must be practical (Jansen et al., 2013). Three approaches are introduced to address these concerns.

First, achieving a shared understanding requires interactions in which developers and teachers collaboratively define elements of the innovation. Research showed that alignment of teachers' understanding of an innovation is necessary for lasting change (Coppoolse, 2018; Cents et al., 2024) as they often interpret and distort a proposed innovation and substitute it for other innovations (Cohen & Ball, 1990; Tyack & Cuban, 1995). The extent to which the core elements must be enacted for the intervention to stay faithful to its objectives is regarded as a significant factor in implementation (McKenney & Reeves, 2019). Thompson and Wiliam (2008) suggested strict adherence to principles and loose accommodations to particularities when implementing an innovation, as long as these are consistent with the principles. Limited empirical research exists regarding the mechanisms of interpretation and distortion in educational contexts and how these can be utilised in preparing an educational implementation. Studies indicate that a professional community of teachers plays a role in making sense of a proposed innovation (Spillane & Zeuli, 1999; Talbert & McLaughlin, 1994). In the case of the PDL project, project members and teachers are required to develop a shared meaning of MIL interventions. Project members are suggested to organise reflective dialogue sessions with teachers to explain and discuss the core elements and examples of how these might be shaped in education.

Second, providing examples of how interventions can be shaped in educational practice is essential (McKenney & Reeves, 2019). The design principles already provide a framework for teachers to discuss and create a shared understanding of MIL interventions (Cremers, 2023). In addition, as suggested in the evaluation and reflection phase, exemplary design materials are helpful for teachers to envision their involvement easily (McKenney & Reeves, 2019). It 1) provides a foundation that helps to align interventions with the original intentions of the designer and the purpose of educating MIL, 2) offers a clearer understanding of how to translate design principles into practical classroom applications, and 3) encourages self-reflection, possibly leading to adjustments in teacher's attitude towards an innovation such as MIL interventions (Van den Akker, 1998). In practice, the PDL project team is required to develop exemplary intervention materials based on the MIL design principles and their experiences in honours education, extracurricular activities, and degree programs. Project members are suggested to develop a workshop in which teachers are provided with teacher materials on MIL interventions, such as an intervention on the identification of values, and are guided to experience and practice MIL interventions.

Third, teachers' capacities to execute MIL interventions require attention when implementing them (Waslander, 2007). Two experts in the evaluation and reflection phase suggested that teachers in Dutch higher education may not be prepared to conduct MIL interventions. Whether this is the case remains a question and should be explored. Which specific teachers' capacities should be developed and how these capacities should be developed is also not yet known. The results of the

analysis and exploration phase show that capacities include adapting guidance to fit individual learning needs. This may align with skills attributed to teachers as coaches (Woudt-Mittendorff & Visscher-Voerman, 2019). However, the required development is not limited to acquiring coaching skills; knowing the MIL concept and its dimensions is needed to support students' development, as addressed by the experts in the evaluation and reflection phase. Without this knowledge, teachers may inadvertently implement ineffective interventions. The necessary teacher development to conduct MIL interventions thus requires attention to maximise interventions' effect on students' MIL experience. Therefore, the PDL project team should explore which capacities teachers should develop to execute MIL interventions and develop guidance and training offerings for teachers.

7.2 Practical Implications

In this study, a framework of design principles is developed for educational designers to develop MIL interventions in higher education. This answers the dissemination needs of MIL interventions in the PDL project and provides the PDL project directions for designing MIL interventions in the insert program and existing initiatives. This research suggests that in designing coherence interventions, the focus should be mainly on characteristics of Consciousness, Self, and Others, which are aimed at promoting self-knowledge. For designing purpose interventions, the focus should be on characteristics of Consciousness, Doing, self and Others, which are aimed at goal setting and taking action. For designing significance interventions, the focus should be mainly on characteristics of Self and Others, which are aimed at valuing the capacities of oneself and others. Implementing these interventions requires attention to their alignment with curricula and increasing teachers' understanding of MIL interventions. This requires the PDL project team to develop support offerings and teaching materials. Altogether, the design principles support teachers in designing education that encourages students to experience MIL and may ultimately contribute to lower switch and drop-out rates (Lees et al., 2022)

7.3 Theoretical Implications

The framework of design principles to design MIL interventions in higher education developed in this study answers the need for more clarity in the intervention literature about the design factors contributing to the sense of MIL in education (Steger et al., 2021). Design principles of Consciousness, Others, and Self are found to address multiple dimensions. The most substantial connection between dimensions is coherence-purpose, as the dimensions share principles promoting both dimensions. This supports adolescents' development of multiple dimensions simultaneously and contributes to MIL intervention literature. In addition, it is found that the differentiation of categories by Steger (2022) is not exclusive in practice, which indicates the necessity of interrelated theory

development of MIL in education. This also provides design evidence for interrelated but separate dimensions of MIL (George & Park, 2017). In sum, this study contributed to design knowledge for MIL interventions in higher education and developing adolescents' MIL.

7.4 Limitations

The methodology used in this study has some limitations. First, the case studies used to develop the design principles only cover some disciplines in higher education. The focus groups covered two programs: 1) an extracurricular support program for students at risk of dropping out and 2) a minor program to teach students about conscious business and one's purpose. To generalise these design principles to other contexts within education, it is vital to investigate whether they fit the other context ('t Mannetje, 2023). To illustrate, technology students are more often disengaged in moral education and show less purposeful profiles than other students (Kuusisto et al., 2023) and developing a purpose profile has been found most challenging in the technology domain (Malin, 2022; Tirri & Kuusisto, 2016). Reasons for this can be found in both students' and teachers' conceptions (Bourn & Neal, 2008). It is thus crucial to consider contextual elements like teacher engagement, student motivation, and the timing of the intervention (Mangan et al., 2020). Nevertheless, this study tried to unravel the MIL construct into a set of design principles that can be regarded as recommendations, which require designers and teachers to adjust these to their specific contexts.

In addition, the data gathered through interviews should be regarded with caution. Assertions made by interviewees may not be entirely scientifically accurate or applicable to the context (for instance, a participant expresses a vision rather than a scientific viewpoint), and these claims might be constrained by deficient or selective recollection (Qu & Dumay, 2011; Slettebø, 2020). This was most prevalent in the analysis and exploration phase interviews. The interviews revealed strong opinions and visions about education that influenced participants' views. Despite the researcher's efforts to scientifically counterargument opinions and visions, the interpretation of the interviews is a subjective process (Qu & Dumay, 2011), and thus, data may be impacted. In the case of the evaluation and reflection interviews, none of the experts specialised in the concept of MIL (those who did and were requested were not available to participate). It was noticeable that experts showed their interpretation of the concepts based on their scientific background and experience, which may not fully correspond with the concepts. However, interviews are known for exploring participants' viewpoints and experiences, fostering the emergence of fresh and alternative interpretations (Qu & Dumay, 2011) that inspire reflection in the current study. Despite the impact on the data, measures were taken to ensure scientific input for (further development of) the design principles.

7.5 Future Research

One proximal and one distal recommendation are described for future research. The proximal recommendation is the need for further development of the design principles. The evaluation and reflection phase concluded several issues that should be addressed to improve the soundness and feasibility of the design principles before applying them in the educational context. First, the framing of the design principles should be clarified. Second, based on the breakdown of principles by Kali (2006), meta-principles per dimension can be described, consisting of practical principles of synthesised procedures (in and between the categories) and concrete examples, and specific principles consisting of directives towards teacher behaviours. Third, the conceptualisation of significance in education should be reviewed. This can be achieved through an additional design and construction phase.

Subsequently, the distal recommendation is to design interventions based on the further developed design principles and implement these in educational settings to study the design principles' validity, as highlighted by 't Mannetje (2023). Two experts in the evaluation and reflection phase also mentioned this as a requirement for further development. The experiences gained from these practical experiences can help to refine the design principles further and explore their applicability in diverse educational contexts (Herrington & Reeves, 2011; McKenney & Reeves, 2019). It is crucial to verify MIL interventions among teachers and students to assess their suitability for students in the specific educational context. By adopting this approach, students' sense of MIL across higher education is encouraged.

This study aimed to develop design principles for interventions to encourage students' sense of MIL in higher education. It provided insights into MIL and design literature about the development of adolescents' MIL and a design framework to develop MIL interventions for the purpose-driven learning project. Ultimately, these contribute to helping students find the most suitable degree program for their future lives and careers.

8 References

Aloise-Young, P. A., Hennigan, K. M., & Leong, C. W. (2001). Possible selves and negative health behaviours during early adolescence. *Journal of Early Adolescence, 21*(2), 158–181.

Au, W. C. C., & Kennedy, K. J. (2018). A positive education program to promote wellbeing in schools: A case study from a Hong Kong school. *Higher Education Studies, 8*(4), 9–22. https://doi.org/10.5539/hes.v8n4p9

Baarda, B., Bakker, E., Boullart, A., Fischer, T., Julsing, M., Peters, V., & Van der Velden, T. (2018). *Basisboek Kwalitatief onderzoek [Basics of Qualitative research].* Noordhoff Uitgevers.

Bakker, A. (2019). Design principles in design research: A commentary. *Unterrichtsentwicklung macht Schule: Forschung und Innovation im Fachunterricht*, 177-192. https://doi.org/10.1007/978-3-658-20487-7_10

Bailey, T. H., & Phillips, L. J. (2016). The influence of motivation and adaptation on students' subjective well-being, meaning in life and academic performance. *Higher Education Research & Development*, *35*(2), 201–216. http://dx.doi.org/10.1080/07294360.2015.1087474

Barcaccia, B., Couyoumdjian, A., Di Consiglio, M., Papa, C., Cancellieri, U. G., & Cervin, M. (2023). Purpose in life as an asset for well-being and a protective factor against depression in adolescents. *Frontiers in Psychology*, *14*, 1250279. https://doi.org/10.3389/fpsyg.2023.1250279

Bourn, D., & Neal, I. (2008). *The global engineer. Incorporating global skills within UK higher education of engineers*. Engineers against poverty and IOE, University of London. https://discovery.ucl.ac.uk/id/eprint/1492710/

Bronk, K. C., Baumsteiger, R., Mangan, S., Riches, B., Dubon, V., Benavides, C., & Bono, G. (2019). Fostering purpose among young adults: Effective online interventions. *Journal of Character Education*, *15*(2), 21-38.

Bronk, K. C., Leontopoulou, S., & McConchie, J. (2018). Youth purpose during the great recession: A mixed-methods study. *The Journal of Positive Psychology*, *14*(4), 405–416. https://doi.org/10.1080/17439760.2018.1484942

Brouzos, A., Vassilopoulos, S. P., & Boumpouli, C. (2016). Adolescents' subjective and psychological well-being: The role of meaning in life. *Hellenic Journal of Psychology*, *13*(3), 153-169.

Bundick, M. (2009). *Pursuing the Good Life: An examination of Purpose, meaningful Engagement, and Psychological Well-Being in Emerging Adulthood.* (Doctoral dissertation, Stanford University). Stanford University. http://purl.stanford.edu/cb008zb6473

Carver, C. S., & Scheier, M. F. (2000). On the structure of behavioral self-regulation. In M. Boekaerts, P. R. Pintrich, & M. Zeidner, *Handbook of Self-Regulation* (pp. 41-84). Academic Press. https://doi.org/10.1016/B978-012109890-2/50032-9

Cents-Boonstra, M., Eshuis E. H., Coppoolse, R., & Holkenborg, K. J. (2024). Meaning in Life in het onderwijs. Leergeschiedenis onderzoek naar afstemming van mentale modellen in onderwijsvernieuwing. [Meaning in Life in education. Learning history research on mental model alignment in educational innovation]. Article in preparation.

Chang, R., Fukuda, E., Durham, J., & Little, T. D. (2017). Enhancing students' motivation with autonomy-supportive classrooms. In M. L. Wehmeyer, K. A. Shogren, T. D. Little, & S. J. Lopez (Eds.), *Development of self-determination throughout the life-course* (pp. 99–110). Springer. https://doi.org/10.1007/978-94-024-1042-6_8

Chen, Y., Kim, E. S., Koh, H. K., Frazier, A. L., & VanderWeele, T. J. (2019). Sense of mission and subsequent health and well-being among young adults: An outcome-wide analysis. *American Journal of Epidemiology*, *188*(4), 664-673. https://doi.org/10.1093/aje/kwz009

Coburn, C. E. (2003). Rethinking scale: Moving beyond numbers to deep and lasting change. *Educational Researcher*, *32*(6), 3-12. https://doi.org/10.3102/0013189X032006003

Cohen, D. K., & Ball, D. L. (1990). Policy and practice: An overview. *Educational evaluation and policy analysis*, *12*(3), 233-239. https://doi.org/10.2307/1164349

Coppley, J., & Niemiec, R. M. (2021). Character strengths interventions in education systems. In M. L. Kern & M. L. Wehmeyer (Eds.), *The Palgrave Handbook of Positive Education* (pp. 395-420). Springer International Publishing. https://doi.org/10.1007/978-3-030-64537-3

Coppoolse, R. (2023). Werkregels voor innovatiemanagers. Vernieuwing in het hoger beroepsonderwijs in een versnelling [Work rules for innovation managers. Acceleration of innovation in higher professional education]. (Doctoral dissertation, Utrecht University). Utrecht University of Applied Sciences. https://husite.nl/onderwijskundigleiderschap/proefschrift-remco-coppoolse-werkregels-voor-innovatiemanagers/

Costin, V., & Vignoles, V. L. (2020). Meaning is about mattering: Evaluating coherence, purpose, and existential mattering as precursors of meaning in life judgments. *Journal of Personality and Social Psychology*, *118*(4), 864. https://doi.org/10.1037/pspp0000225

Coulombe, S., Hardy, K., & Goldfarb, R. (2020). Promoting wellbeing through positive education: A critical review and proposed social ecological approach. *Theory and Research in Education*, *18*(3), 295-321. https://doi.org/10.1177/1477878520988432

Coyne, I. (1997). Sampling in qualitative research. Purposeful and theoretical sampling; merging or clear boundaries? *Journal of Advanced Nursing*, *26*(3), 623–630. https://doi.org/10.1046/j.1365-2648.1997.t01-25-00999.x

Cremers, P. (2023). Het gebruiken van ontwerpprincipes in ontwerpgericht onderzoek [Using design principles in design-based research]. In K. Van Turnhout, D. Andriessen, & P. Cremers (Eds.),

Handboek Ontwerpgericht Wetenschappelijk Onderzoek [Handbook of Design Science Research] (pp. 263-275). Boom Uitgevers Amsterdam.

Cremers, P., & Van Turnhout, K. (2023). Structureren van ontwerpgericht onderzoek [Structuring design-based research]. In K. Van Turnhout, D. Andriessen, & P. Cremers (Eds.), *Handboek Ontwerpgericht Wetenschappelijk Onderzoek [Handbook of Design Science Research]* (pp. 99-115). Boom Uitgevers Amsterdam.

Creswell, J. D., Welch, W. T., Taylor, S. E., Sherman, D. K., Gruenewald, T. L., & Mann, T. (2005). Affirmation of personal values buffers neuroendocrine and psychological stress responses. *Psychological Science, 16,* 846–851. https://doi.org/10.1111/j.1467-9280.2005.01624.x

Damon, W., Menon, J., & Cotton Bronk, K. (2003). The development of purpose during adolescence. *Applied developmental science*, *7*(3), 119–128. https://doi.org/10.1207/S1532480XADS0703_2

De Boer, H., Bergstra, A., & Kostons, D. (2012). *Effective strategies for self-regulated learning: A meta-analysis.* GION, University of Groningen. https://research.rug.nl/en/publications/effective-strategies-for-self-regulated-learning-a-meta-analysis

Denyer, D., Tranfield, D., & Van Aken, J. E. (2008). Developing design propositions through research synthesis. *Organization Studies*, *29*(3), 393–413. https://doi.org/10.1177/0170840607088020

Dik, B. J., Steger, M. F., Gibson, A., & Peisner, W. (2011). Make your work matter: Development and pilot evaluation of a purpose-centered career education intervention. *New Directions for Youth Development*, *2011*(132), 59-73. https://doi.org/10.1002/yd.428

Donaldson, S. I., Dollwet, M., & Rao, M. A. (2015). Happiness, excellence, and optimal human functioning revisited: Examining the peer-reviewed literature linked to positive psychology. *The Journal of Positive Psychology*, *10*(3), 185-195. https://doi.org/10.1080/17439760.2014.943801

Duckworth, A. L., Kirby, T. A., Gollwitzer, A., & Oettingen, G. (2013). From fantasy to action: Mental contrasting with implementation intentions (MCII) improves academic performance in children. *Social Psychological and Personality Science*, *4*(6), 745-753. https://doi.org/10.1177/1948550613476307

Edelson, D. C. (2002). Design research: What we learn when we engage in design. *The Journal of the Learning Sciences*, *11*(1), 105-121.

Edwards, M. J., & Holden, R. R. (2001). Coping, meaning in life, and suicidal manifestations: Examining gender differences. *Journal of Clinical Psychology*, *57*(12), 1517-1534. https://doi.org/10.1002/jclp.1114

Erikson, E. H. (1968). *Identity: Youth and crisis*. Norton.

Flett, G., Khan, A., & Su, C. (2019). Mattering and psychological well-being in college and university students: Review and recommendations for campus-based initiatives. *International Journal of Mental Health and Addiction*, *17*, 667-680. https://doi.org/10.1007/s11469-019-00073-6

Fry, P. S. (1998). The development of personal meaning and wisdom in adolescence: A reexamination of moderating and con-solidating factors and influences. In P. T. P. Wong & P. S. Fry (Eds.), *The Human Quest for Meaning*: *A Handbook of Psychological Research and Clinical Applications* (pp. 91–110). Lawrence Erlbaum Associates, Inc.

Fullan, M., & Pomfret, A. (1977). Research on curriculum and instruction implementation. *Review of Educational Research*, *47*(2), 335-397. https://doi.org/10.2307/1170134

George, L. S., & Park, C. L. (2013). Are meaning and purpose distinct? An examination of correlates and predictors. *The Journal of Positive Psychology*, *8*(5), 365–375. https://doi.org/10.1080/17439760.2013.805801

George, L. S., & Park, C. L. (2014). Existential mattering: Bringing attention to a neglected but central aspect of meaning?. *Meaning in Positive and Existential Psychology*, 39–51. https://doi.org/10.1007/978-1-4939-0308-5_3

George, L. S., & Park, C. L. (2016). Meaning in life as comprehension, purpose, and mattering: Toward integration and new research questions. *Review of General Psychology*, *20*(3), 205–220. https://doi.org/10.1037/gpr0000077

George, L. S., & Park, C. L. (2017). The multidimensional existential meaning scale: A tripartite approach to measuring meaning in life. *The Journal of Positive Psychology*, *12*(6), 613–627. https://doi.org/10.1007/978-3-030-52140-0_6

Gilbert, E., Foulk, T., & Bono, J. (2018). Building personal resources through interventions: An integrative review. *Journal of Organizational Behavior*, *39*(2), 214–228. https://doi.org/10.1002/job.2198

Greeno, J. G. (2016). Cultural-historical activity theory/design-based research in Pasteur's quadrant. *Journal of the Learning Sciences*, *25*(4), 634-639. https://doi.org/10.1080/10508406.2016.1221718

Hart, D., Donnelly, T. M., Youniss, J., & Atkins, R. (2007). High school community service as a predictor of adult voting and volunteering. *American Educational Research Journal*, *44*(1), 197–219. https://doi.org/10.3102/0002831206298173

Heine, S. J., Proulx, T., & Vohs, K. D. (2006). The meaning maintenance model: On the coherence of social motivations. *Personality and Social Psychology Review*, *10*(2), 88-110.

Heintzelman, S. J., & King, L. A. (2014). Life is pretty meaningful. *American Psychologist*, *69*(6), 561–574. https://doi.org/10.1037/a0035049

Herrington, J., & Reeves, T. C. (2011). Using design principles to improve pedagogical practice and promote student engagement. *Proceedings of Ascilite 2011,* 594–601.

InHolland. (2023). *Students as Partners (SAP)*. InHolland. Accessed on 29th December 2023 by https://www.inholland.nl/onderzoek/onderzoeksprojecten/students-as-partners-sap/

Kali, Y. (2006). Collaborative knowledge building using the Design Principles Database. *International Journal of Computer-supported Collaborative Learning*, *1*, 187–201. https://doi.org/10.1007/s11412-006-8993-x

Kashdan, T. B., & McKnight, P. E. (2013). Commitment to a purpose in life: an antidote to the suffering by individuals with social anxiety disorder. *Emotion*, *13*(6), 1150. https://doi.org/10.1037/a0033278

Kim, E. S., Delaney, S. W., & Kubzansky, L. D. (2019). Sense of purpose in life and cardiovascular disease: Underlying mechanisms and future directions. *Current Cardiology Reports, 21*(11), 135. https://doi.org/10.1007/s11886-019-1222-9

Könings, K. D., Seidel, T., & van Merriënboer, J. J. (2014). Participatory design of learning environments: Integrating perspectives of students, teachers, and designers. *Instructional Science, 42*(1), 1-9. https://doi.org/10.1007/s11251-013-9305-2

Kosine, N. R., Steger, M. F., & Duncan, S. (2008). Purpose-centered career development: A strengths-based approach to finding meaning and purpose in careers. *Professional School Counseling*, *12*(2). https://doi.org/10.1177/2156759X0801200209

Koshy, S. I., & Mariano, J. M. (2011). Promoting youth purpose: A review of the literature. *New directions for youth development*, *2011*(132), 13–29. https://doi.org/10.1002/yd.425

Kuusisto, E., de Groot, I., de Ruyter, D., Schutte, I., Rissanen, I., & Suransky, C. (2023). Life purposes: Comparing higher education students in four institutions in the Netherlands and Finland. *Journal of Moral Education*, 1-22. https://doi.org/10.1080/03057240.2022.2159347

Lambert, N. M., Stillman, T. F., Hicks, J. A., Kamble, S., Baumeister, R. F., & Fincham, F. D. (2013). To belong is to matter: Sense of belonging enhances meaning in life. *Personality and Social Psychology Bulletin*, *39*(11), 1418-1427. https://doi.org/10.1177/0146167213499186

Leest, B., van Langen, A., & Smeets, E. (2022). De eerste honderd dagen in het hoger onderwijs. Een overzichtsstudie [The first hundred days in higher education. An overview study]. KBA Nijmegen. https://www.expertisepuntlob.nl/bestanden/artikelen/13/1782_de_eerste_honderd_dagen_in_het_hoger_onderwijs,_20220818_KBA.pdf?1679906698=

Leontiev, D. A. (2017). Converging paths toward meaning. *Journal of Constructivist Psychology*, *30*(1), 74–81. https://doi.org/10.1080/10720537.2015.1119089

Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist*, *57*(9), 705. https://doi.org/10.1037//0003-066X.57.9.705

Locke, E. A., & Latham, G. P. (2006). New directions in goal-setting theory. *Current Directions in Psychological Science*, *15*(5), 265–268.

Lodewijk, J. & Cuppen, J. (2023). Uitval en Switch. In Van de Broek, A., Termorshuizen, T., & Cuppen, J., (Red.). *Monitor Beleidsmaatregelen Hoger Onderwijs 2022-2023 [Monitor Higher Education Policies 2022-2023]* (pp. 169-202). ResearchNed

Luken, T. (2008). De (on)mogelijkheid van nieuw leren en zelfsturing [The (im)possibility of new learning and self-direction]. In M. Kuijpers & F. Meijers (Reds.), *Loopbaanleren: Onderoek en prakijk in het onderwijs [Career learning: Research and practice in education]* (pp. 127-151). Garant.

Lund, T. J., Liang, B., Lincoln, B., White, A. E., Mousseau, A. M. D., Mejia Gomez, L. A., & Akins, E. (2022). Purpose in life among first-generation college students: Friends make a difference. *Youth*, *2*(1), 12-22. https://doi.org/10.3390/youth2010002

Makola, S. (2014). Sense of meaning and study perseverance and completion: A brief report. *Journal of Psychology in Africa*, 24(3), 285–287. http://dx.doi.org/10.1080/14330237.2014.906084

Malin, H. (2022). Engaging purpose in college: A person-centered approach to studying purpose in relation to college experiences. *Applied Developmental Science*, *27*(1), 83–98. https://doi.org/10.1080/10888691.2022.2033120

Mangan, S., Baumsteiger, R., & Bronk, K. C. (2020). Recommendations for positive psychology interventions in school settings. *The Journal of Positive Psychology*, *15*(5), 653-656. https://doi.org/10.1080/17439760.2020.1789709

Martela, F., & Steger, M. F. (2016). The three meanings of meaning in life: Distinguishing coherence, purpose, and significance. *The Journal of Positive Psychology*, *11*(5), 531-545. http://dx.doi.org/10.1080/17439760.2015.1137623

Martela, F., & Steger, M. F. (2023). The role of significance relative to the other dimensions of meaning in life–an examination utilizing the three dimensional meaning in life scale (3DM). *The Journal of Positive Psychology*, *18*(4), 606-626. https://doi.org/10.1080/17439760.2022.2070528

Martin Sanz, N., Rodrigo, I., Izquierdo GarcÃa, C., & Ajenjo Pastrana, P. (2017). Exploring Academic Performance: Looking beyond Numerical Grades. *Universal Journal of Educational Research*, *5*(7), 1105-1112. https://doi.org/10.13189/ujer.2017.050703

McKenney, S. & Reeves, T. C. (2019). *Conducting educational design research.* Routledge.

McKnight, P. E., & Kashdan, T. B. (2009). Purpose in life as a system that creates and sustains health and well-being: An integrative, testable theory. *Review of General Psychology*, *13*(3), 242–251. https://doi.org/10.1037/a0017152

McMaster University Library Press. (2023, October 16). *International Journal for Students as Partners.* Accessed on 29th December 2023 by https://mulpress.mcmaster.ca/ijsap

Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological review*, *63*(2), 81.

Morisano, D., Hirsh, J. B., Peterson, J. B., Pihl, R. O., & Shore, B. M. (2010). Setting, elaborating, and reflecting on personal goals improves academic performance. *Journal of Applied Psychology*, *95*(2), 255. https://doi.org/10.1037/a0018478

Nieveen, N., & Folmer, E. (2013). Formative evaluation in educational design research. In T. Plomp, & N. Nieveen (Eds.), *Educational Design Research* (pp. 52-71). SLO.

NRO. (2023). *Previously granted Comenius projects.* Nationaal Regieorgaan Onderwijsonderzoek [National Education Research Organisation]. Accessed on 29th December 2023 by https://www.nro.nl/en/onderzoeksprogrammas/comeniusprogramma/toegekende-projecten

Nurra, C., & Oyserman, D. (2018). From future self to current action: An identity-based motivation perspective. *Self and identity*, *17*(3), 343–364. https://doi.org/10.1080/15298868.2017.1375003

Oyserman, D., Bybee, D., & Terry, K. (2006). Possible selves and academic outcomes: How and when possible selves impel action. *Journal of Personality and Social Psychology*, *91*(1), 188. https://doi.org/10.1037/0022-3514.91.1.188

Park, C. L. (2010). Making sense of the meaning literature: An integrative review of meaning making and its effects on adjustment to stressful life events. *Psychological Bulletin*, *136*(2), 257. https://doi.org/10.1037/a0018301

Park, C. L., & Folkman, S. (1997). Meaning in the context of stress and coping. *Review of General Psychology, 30,* 115–144. https://doi.org/10.1037/1089-2680.1.2.115

Piliavin, J. A., & Siegl, E. (2007). Health benefits of volunteering in the Wisconsin Longitudinal Study. *Journal of Health and Social Behavior*, *48*, 450–464.

Qu, S. Q., & Dumay, J. (2011). The qualitative research interview. *Qualitative Research in Accounting & Management, 8*(3), 238–264. https://doi.org/10.1108/11766091111162070

Ratner, K., Burrow, A. L., Burd, K. A., & Hill, P. L. (2019). On the conflation of purpose and meaning in life: A qualitative study of high school and college student conceptions. *Applied Developmental Science*, *25*(4), 364–384. https://doi.org/10.1080/10888691.2019.1659140

Reber, R. (2019). Making school meaningful: Linking psychology of education to meaning in life. *Educational Review*, *71*(4), 445–465. https://doi.org/10.1080/00131911.2018.1428177

Reeve, J. (2012). A self-determination theory perspective on student engagement. In S. L. Christenson, A. L. Reschly, & C. Wylie, *Handbook of Research on Student Engagement* (pp. 149–172). Springer US. https://doi.org/10.1007/978-1-4614-2018-7_7

Reeve, J., & Cheon, S. H. (2014). An intervention-based program of research on teachers' motivating styles. In S. Karabenick & T. Urdan's (Eds.), *Advances in motivation and achievement: Motivational interventions* (Vol. 18, pp. 293–339). Emerald Group Publishing. https://doi.org/10.1108/S0749-742320140000018008

Reeve, J., & Cheon, S. H. (2020). Sociocultural influences on teachers' reactions to an intervention to help them become more autonomy supportive. In G. A. D. Liem & D. M. McInerney (Eds.), *Promoting motivation and learning in contexts: Sociocultural perspectives on educational interventions* (pp. 13–36). Information Age Publishing.

Reeve, J., Ryan, R. M., & Deci, E. L. (2018). Sociocultural influences on student motivation as viewed through the lens of self-determination theory. In D. M. McInerney & G. A. D. Liem (Eds.), *Big theories revisited 2: Research on socio-cultural influences on motivation and learning* (pp. 15–40). Information Age Publishing.

Reker, G. T., & Wong, P. T. (2012). Personal meaning in life and psychosocial adaptation in the later years. *The human quest for meaning: Theories, research, and applications*, 433-456.

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, *52*(1), 141-166.

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of personality and social psychology*, *57*(6), 1069.

Sandoval, W. (2014). Conjecture mapping: An approach to systematic educational design research. *Journal of the Learning Sciences*, *23*(1), 18–36. https://doi.org/10.1080/10508406.2013.778204

Schippers, M. C., Scheepers, A. W., & Peterson, J. B. (2015). A scalable goal-setting intervention closes both the gender and ethnic minority achievement gap. *Palgrave Communications*, *1*(1), 1-12. https://doi.org/10.1057/palcomms.2015.14

Schippers, M. C., & Ziegler, N. (2019). Life crafting as a way to find purpose and meaning in life. *Frontiers in Psychology*, *10*, 2778. https://doi.org/10.3389/fpsyg.2019.02778

Shamah, D. (2011). Supporting a strong sense of purpose: Lessons from a rural community. *New Directions for Youth Development*, *2011*(132), 45–58. https://doi.org/10.1002/yd.427

Shin, J. Y., & Steger, M. F. (2014). Promoting meaning and purpose in life. In A. C. Parks & S. M. Schueller (Eds.), *The Wiley Blackwell Handbook of Positive Psychological Interventions*, (pp. 90–110). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781118315927

Shin, J. Y., & Steger, M. F. (2016). Supportive college environment for meaning searching and meaning in life among American college students. *Journal of College Student Development*, *57*(1), 18–31. https://doi.org/10.1353/csd.2016.0005

Shoshani, A., Steinmetz, S., & Kanat-Maymon, Y. (2016). Effects of the Maytiv positive psychology school program on early adolescents' well-being, engagement, and achievement. *Journal of School Psychology, 57,* 73–92. https://doi.org/10.1016/j.jsp.2016.05.003

Slettebø, T. (2020). Participant validation: Exploring a contested tool in qualitative research. *Qualitative Social Work, 20*(5), 1223–1238*.* https://doi.org/10.1177/1473325020968189

Spillane, J. P., & Zeuli, J. S. (1999). Reform and teaching: Exploring patterns of practice in the context of national and state mathematics reforms. *Educational Evaluation and Policy Analysis*, *21*(1), 1-27. https://doi.org/10.3102/01623737021001001

Steger, M. F. (2009). Meaning in life. In P. E. Nathan, C. R. Snyder, & S. J. Lopez (Eds.), *The Oxford Handbook of Positive Psychology* (pp. 679-687). Oxford University Press.

Steger, M. F. (2022). Making meaning in life: A thematic review of successful experimental psychological and psychotherapeutic interventions. *Meaning in Life International Conference 2022 - Cultivating, Promoting, and Enhancing Meaning in Life Across Cultures and Life Span* (pp. 5-20). Atlantis Press. https://doi.org/10.2991/978-94-6463-096-1_2

Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The meaning in life questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology*, *53*(1), 80. https://doi.org/10.1037/0022-0167.53.1.80

Steger, M. F., Kashdan, T. B., Sullivan, B. A., & Lorentz, D. (2008a). Understanding the search for meaning in life: Personality, cognitive style, and the dynamic between seeking and experiencing meaning. *Journal of Personality, 76*(2), 199–228. https://doi.org/10.1111/j.1467-6494.2007.00484.x

Steger, M. F., Kawabata, Y., Shimai, S., & Otake, K. (2008b). The meaningful life in Japan and the United States: Levels and correlates of meaning in life. *Journal of Research in Personality*, *42*(3), 660-678. https://doi.org/10.1016/j.jrp.2007.09.003

Steger, M. F., O'Donnell, M. B., & Morse, J. L. (2021). Helping students find their way to meaning: Meaning and purpose in education. In M. L. Kern & M. L. Wehmeyer (Eds.), *The Palgrave Handbook of Positive Education* (pp. 551–579). Springer International Publishing. https://doi.org/10.1007/978-3-030-64537-3

Steger, M. F., Oishi, S., & Kashdan, T. B. (2009). Meaning in life across the life span: Levels and correlates of meaning in life from emerging adulthood to older adulthood. *The Journal of Positive Psychology*, *4*(1), 43-52.https://doi.org/10.1080/17439760802303127

Talbert, J. E., & McLaughlin, M. W. (1994). Teacher professionalism in local school contexts. *American Journal of Education*, *102*(2), 123-153.

Thompson, M., & Wiliam, D. (2007). Tight but loose: A conceptual framework for scaling up school reforms. In C. Wylie (Eds.), A*nnual Meeting of the American Educational Research Association*. AERA.

Tinto, V. (2017). Through the eyes of students. *Journal of College Student Retention: Research, Theory, and Practice, 19*, 254–269. https://doi.org/10.1177/1521025115621917.

Tirri, K., & Kuusisto, E. (2016). Finnish student teachers' perceptions on the role of purpose in teaching. *Journal of Education for Teaching*, *42*(5), 532-540. http://dx.doi.org/10.1080/02607476.2016.1226552

't Mannetje, J. E. M. M. (2023). *Let them Flourish. Enhancing higher education students' well-being.* (Doctoral dissertation, University of Groningen). https://doi.org/10.33612/diss.569997153

Tyack, D. & Cuban, L. (1995). Tinkering toward Utopia. A Century of Public School Reform. Harvard University Press.

Van den Akker, J. (1998). The science curriculum: Between ideals and outcomes. In B. Fraser & K. Robin (Eds.), *International Handbook of Science Education* (pp. 421-447). Kluwer Academic Publishers.

Van den Akker, J. (1999). Principles and methods of development research. In J. van den Akker, R. M. Branch, K. Gustafson, N. Nieveen, & T. Plomp (Eds.), *Design Approaches and Tools in Education and Training* (pp. 1–14). Springer. https://doi.org/10.1007/978-94-011-4255-7

Van den Akker, J. (2007). Curriculum design research. In T. Plomp, & N. Nieveen (Eds.), *An Introduction to Educational Design Research*, *37*, 37-50. SLO.

Van den Berg, B. (2023). *Design principles for regenerative higher education in times of sustainability transitions* (Doctoral dissertation, Wageningen University). https://doi.org/10.18174/589879

Van Tongeren, D. R., DeWall, C. N., Green, J. D., Cairo, A. H., Davis, D. E., & Hook, J. N. (2018). Self-regulation facilitates meaning in life. *Review of General Psychology*, *22*(1), 95–106. https://doi.org/10.1037/gpr0000121

Van Turnhout, K, & Lusse, M. (2023). Ontwerpen van de onderzoeksaanpak [Designing the research approach]. In K. Van Turnhout, D. Andriessen, & P. Cremers (Eds.), *Handboek Ontwerpgericht Wetenschappelijk Onderzoek [Handbook of Design Science Research]* (pp. 155-170). Boom uitgevers Amsterdam.

Vignoles, V. L., Regalia, C., Manzi, C., Golledge, J., & Scabini, E. (2006). Beyond self-esteem: Influence of multiple motives on identity construction. *Journal of Personality and Social Psychology, 90,* 308–333. http://dx.doi.org/10.1037/0022-3514.90.2.308

Vignoles, V. L. (2011). Identity motives. In S. Schwartz, K. Luyckx, & V. L. Vignoles (Eds.), *Handbook of Identity Theory and Research* (pp. 403–432). Springer. http://dx.doi.org/10.1007/978-1- 4419-7988-9_18

Vos, J., & Vitali, D. (2018). The effects of psychological meaning-centered therapies on quality of life and psychological stress: A meta-analysis. *Palliative & Supportive Care, 16*(5), 608-632. https://doi.org/10.1017/S1478951517000931

Ward, S. J., & King, L. A. (2017). Work and the good life: How work contributes to meaning in life. *Research in Organizational Behavior*, *37*, 59–82. https://doi.org/10.1016/j.riob.2017.10.001

Waslander, S. (2007). Leren over innoveren [Learning about innovation]. Overzichtsstudie van wetenschappelijk onderzoek naar duurzaam vernieuwen in het voortgezet onderwijs [Review of academic research on enduring innovation in secondary education]. https://sietskewaslander.nl/media/baym0z5c/waslander-2007-leren-over-innoveren.pdf

Waters, L., & Loton, D. (2019). SEARCH: A meta-framework and review of the field of positive education. *International Journal of Applied Positive Psychology, 4,* 1-46. https://doi.org/10.1007/s41042-019-00017-4

Wehmeyer, M. L., Cheon, S. H., Lee, Y., & Silver, M. (2021). Self-determination in positive education. In M. L. Kern & M. L. Wehmeyer (Eds.), *The Palgrave Handbook of Positive Education* (pp. 225–249). Springer International Publishing. https://doi.org/10.1007/978-3-030-64537-3

Weinstein, N., Ryan, R. M., & Deci, E. L. (2012). Motivation, meaning, and wellness: A self-determination perspective on the creation and internalization of personal meanings and life goals. In P. T. P. Wong (Eds.), *The Human Quest for Meaning: Theories, Research, and Applications* (pp. 81–106). Routledge.

Whitten, D., James, A., & Roberts, C. (2017). Factors that contribute to a sense of belonging in business students on a small 4-year public commuter campus in the Midwest. *Journal of College Student Retention: Research, Theory, and Practice, 22*(1)*,* 99–117. https://doi.org/10.1177/1521025117726520

Womick, J., Ward, S. J., Heintzelman, S. J., Woody, B., & King, L. A. (2019). The existential function of right-wing authoritarianism. *Journal of Personality*, *87*(5), 1056–1073. https://doi.org/10.1111/jopy.12457

Woudt-Mittendorff, K., & Visscher-Voerman, I. (2019). Docent als coach van het leerproces [Teacher as coach of the learning process]. *Onderwijsinnovatie [Educational Innovation], 17*(2), 1-10.

Yeager, D. S., & Bundick, M. J. (2009). The role of purposeful work goals in promoting meaning in life and in schoolwork during adolescence. *Journal of Adolescent Research*, *24*(4), 423-452. https://doi.org/10.1177/0743558409336749

Yeager, D. S., Bundick, M. J., & Johnson, R. (2012). The role of future work goal motives in adolescent identity development: A longitudinal mixed-methods investigation. *Contemporary Educational Psychology*, *37*(3), 206–217. https://doi.org/10.1177/0743558409336749

Yeager, D. S., Henderson, M. D., Paunesku, D., Walton, G. M., D'Mello, S., Spitzer, B. J., & Duckworth, A. L. (2014). Boring but important: A self-transcendent purpose for learning fosters academic self-regulation. *Journal of Personality and Social Psychology*, *107*(4), 559. https://doi.org/10.1037/a0037637

Yomtov, D., Plunkett, S. W., Efrat, R., & Marin, A. G. (2017). Can peer mentors improve first-year experiences of university students? *Journal of College Student Retention: Research, Theory, and Practice, 19*, 25–54. https://doi.org/10.1177/1521025115611398

Yuliawati, L., Virlia, S., Sandjaja, M., Sari, T. P., Sihombing, B., Dorkas, M. A., ... & Kristianingsih, S. A. (2023). Could Purpose in Life Help Unmotivated Students to Thrive? When Motivation and Purpose in Life Matter for Peer Mentoring. *Psychology Research and Behavior Management*, 3139-3149. https://doi.org/10.2147/PRBM.S425161

Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. L. (2002). Conditions for classroom technology innovations. *Teachers College Record*, *104*(3), 482-515. https://doig.org/10.1111/1467-9620.00170

9 Appendices

9.1 Appendix I: Instrument and Codebook Analysis & Exploration Phase

Interview Outline

Overview

Participants	A coach, a designer and a researcher working in the *PDL* project team at Saxion University of Applied Sciences
Selection	Purposive sampling
Method	Semi-structured interview
Duration	Max. 60 minutes
Recording	Audio
Aim	Inzicht krijgen in de perspectieven van belanghebbenden van het PDL-project op het probleem/de kans en de context ervan. Onderwerpen: - Probleem dat PDL probeert op te lossen - PDL definiëren - De behoefte aan doelgericht leren specificeren - Hun rol in het PDL-project - Huidige staat van het PDL-project - Ontwikkeling van PDL

Interview Scheme

Time	Topic	Questions
0 – 5	Introduction	- Deelnemer danken voor deelname - Vraag of participant de informatie over het doel en proces van het interview heft doorgenomen en bevestig dat informed consent heeft ingevuld/opgestuurd - Vraag of participant nog vragen heeft voordat we starten - Vraag toestemming om op te nemen **(opname starten)** - Vraag bevestiging voor toestemming opname + informed consent
5-13	Problem related Topic 1	Topic: Het probleem dat gepoogd wordt om op te lossen dankzij PDL 1. Het ontwikkelen van een PDL was een reactie op een probleem of een kans in het onderwijs. Wat is het probleem dat opgelost wordt met PDL volgens jou? a. Waarom is dit een probleem? b. Hoe is dit probleem ontstaan? c. Hoe uit dit probleem zich? 2. Vaak zijn problemen te relateren aan verschillen tussen beleid, percepties, en praktijk. Al een lange tijd schrijven we bijvoorbeeld dat blended learning goed is om te gebruiken in het onderwijs en toch zien we dit in de praktijk beperkt gebruikt wordt. Op welke manier is dit probleem gerelateerd aan dergelijke verschil tussen beleiRed en praktijk?
13-21	Problem related Topic 2	Topic: Definitie van PDL 1. Laten we kijken naar wat PDL is. Wat is PDL volgens jou? a. Zou je dat kunnen specificeren?

		b. Zou je daar een voorbeeld van kunnen geven dat het verschil weergeeft met hoe het nu gaat? 2. In de literatuur beschrijven ze dat naast *purpose* het van belang is om jezelf en de wereld om je heen goed te begrijpen en het gevoel te hebben dat je van waarde bent. Hoe kijk jij daarnaar in het licht van PDL? 3. Waarom is PDL nodig volgens jou?
21-28	Needs related Topic 1	Topic: Specificeren van de behoefte aan PDL We hebben het gehad over het probleem dat we met PDL willen oplossen, nu heb ik vragen voor je over jouw kijk in hoeverre PDL daar aan deze oplossing kan bijdragen. 1. In hoeverre vind je het probleem waarop PDL is gericht de moeite waard om op te lossen? a. Waar zit dat voornamelijk in volgens jou? 2. Wat is de rol van PDL bij het oplossen van dit probleem? a. Hoe zou dat eruit kunnen zien in onderwijs?
30-38	Context related Topic 1	Topic: Jouw rol in PDL Nu we weten wat het onderliggende probleem is en welke rol PDL kan spelen in de oplossing hiervoor, gaan we kijken naar de context van het PDL-project en de ontwikkeling van PDL. Allereerst jouw rol. 1. Jij bent een coach/ontwerper/onderzoeker in het PDL-project, hoe zien jouw werkzaamheden eruit? a. Hoe verschilt dit van x'en die bij Saxion werken? b. Wat is het perspectief van x'en bij Saxion op PDL, denk je? c. Wat heb je als x nodig in het kader van PDL?
38-46	Context related Topic 2	Topic: Stand van zaken van het PDL-project 1. Hoe wordt PDL momenteel toegepast? a. Programma's, initiatieven? b. Wat zijn de voordelen van de huidige toepassing voor studenten/ docenten/ anderen? c. Waarin verschilt PDL van de huidige curricula bij Saxion?
46-55	Needs related Topic 2	Topic: Ontwikkeling van PDL 1. Wat zijn jouw ideeën voor de ontwikkeling van PDL? 2. Wat is volgens jou de belangrijkste uitdaging om PDL te ontwikkelen? 3. Wat is er volgens jou nodig om PDL te ontwikkelen?
57-60	Conclusion	- Deelnemer bedanken voor deelname - Vragen? - Deel het belang van de inhoud deelnemer door de vervolgstappen in het thesisproject uit te leggen - (Stop opname)

Codebook

Cat.	Code	Definition	Example	Freq.	# of P.
Problem	Problem definition	Problem that PDL tries to solve	"The problem we want to solve is ... that students in existing education are required to acquire all kinds of knowledge and skills that they don't feel any kind of or very little connection to why they're doing it, what they're doing it for, what it's for. So it's disconnected from the person."	10	3
	Problem manifestation	Manifestations of the problem in educational context	"I think inherently with that, there are a lot of problems intertwined with it, like what I just saw and also forwarded that actually only 50% about get their degree. People switch a lot also a lot of studies know that motivation is not very high. So that there seems to be little energy in many students on finishing at least their education."	8	3
	Reasons for problem	Reasons for the problem in educational context	"I think a lot of students also know what they want but there is a very large group just a piece of self-awareness of who am I really. I think there is a lot also in secondary education in which you are schooled in all kinds of ways. So you learn a lot but you learn very little about yourself."	17	3
Concept of PDL	PDL Definition	Core elements of PDL	"It is how can I find the place where I become happy by contributing something to the world. And that's also the challenge because it's not a one-dimensional optimization issue, we're not going to develop just the person, we're going to develop the person based on his place in the world."	31	3
	Reasons for PDL	Reasons for PDL	"I think it's crucial if you look around you what's happening in the world I think [...] at least we're using more than there is, we're abusing each other and we're getting burnt out from the hard work we're doing ... So I think we have to start with young people to so if we want to do something about that on a global level on a country level on a region level on a school level, we will have to start to tell a different story to people"	9	3
Project PDL	Current initiatives	Explanation of current initiatives in the project	"Right now I am a coach within the Kans trajectory, which is a ten-week trajectory in which we guide groups of students, 10 to 12, sometimes a little more, but max	14	3

			15 by meeting weekly, physically getting together and coaching them on …"		
	Difference with curricula	Differences between PDL and current curricula	"Before you know it, it's very supply oriented again whereas it is very much also then to that student want to bring back to the curiosity and connection in the student himself."	14	3

9.2 Appendix II: Instruments and Codebook Design & Construction Phase

Focus group interview outline
Overview

Participants	Focus group 1: 4 teachers, 1 student assistant Focus group 2: 3 teachers, 2 students
Selection	Purposive sampling
Method	Focus group
Duration	Session 1: 60 minutes Session 2: 90 minutes
Recording	Audio
Aim	Session 1: exploring the concepts and grasping the nuances in the concepts by discussing practical examples from participants' work context. Session 2: collaboratively describing characteristics, procedures, and arguments as input for design principles.
Prep	All participants were provided with definitions and characteristics of definitions upfront – so that they were able to read about the concepts before the first meeting.

Interview scheme session 1: 60 minutes

Time	Topic	Questions
0 – 5	Introduction	- Thank participants for participating - Ask participants if they have reviewed the information about the purpose and process of the interview and confirm that they have completed/sent informed consent - Ask if participant has any questions before we start - Ask permission to record (start recording) - Explain purpose of focus group and first session: in this first session we will go through and discuss each definition.
5 - 10	Intro: Meaning in life	- Presentation of *meaning in life* definition 1. Discussion about definition. a. How do you interpret this definition? b. Does this definition match your viewpoint? c. Are we missing any important aspects as far as you are concerned? Checking whether conceptions in general fit with the definition.
10-25	Coherence	- Presentation of *coherence* definition - Discussion following definition. o How do you interpret this definition? o Does this definition match your images? o Are we missing any important aspects as far as you are concerned? - Examples from their practice o What does this look like for students? What do they do in coherence? o How do you design this in your program at this moment? o To what extent do you think this is important for developing meaning in life? o To what extent can coherence be developed in education among students?

		○ How could this development of coherence be designed in education?
25-40	Purpose	- Presentation of *purpose* definition - Discussion following definition. ○ How do you interpret this definition? ○ Does this definition match your images? ○ Are we missing any important aspects as far as you are concerned? - Examples from their practice ○ What does this look like for students? What do they do when they practice purpose? ○ How do you design this in your program at this moment? ○ To what extent do you think this is important for developing meaning in life? ○ To what extent can purpose be developed in education among students? ○ How could this development of purpose be designed in education?
40-55	Significance	- Presentation of *significance* definition - Discussion following definition. ○ How do you interpret this definition? ○ Does this definition match your images? ○ Are we missing any important aspects as far as you are concerned? - Examples from their practice ○ What does this look like for students? What do they do when they practice significance? ○ How do you design this in your program at this moment? ○ To what extent do you think this is important for developing meaning in life? ○ To what extent can significance be developed in education among students? ○ How could this development of significance be designed in education?
55-60	Conclusion	- Questions? - Thanking participants for participating - Share the importance of the content participant by explaining the next steps in the thesis project - (Stop recording)

Interview scheme session 2: 90 minutes

Time	Topic	Questions
0 – 10	Introduction	- Participant thanks for participation - Ask if participants have any questions before we start - Explain purpose of focus group and second session: formulate design principles; the main goal is to get a picture of their good examples and how and why these work. - Recap of first session: summarise results from first session - Discuss format sheet; share the components of a design principle based on definition - Rules of engagement:

		○ My role is of the moderator. I'll check time and check whether topics are addressed. ○ Every answer is right; your opinion and your experience is important here. ○ It is a conversation. Add to statements of others, or if you disagree, contradict them. In addition, you can start talking about another topic that you think is important. ○ Wait for your turn. If not, it disrupts the recording, making the data of lower quality. If you want to state something, wait your turn or try to give me a sign so I know you want to say something.
10-35	Coherence	- Presenting definition of *coherence* Questions: - What is an example of an intervention you use to improve coherence of students? • What does this intervention look like? • What is needed to promote students' coherence in this intervention? • How do you execute this intervention? • Why are these characteristics/ procedures important?
35-60	Purpose	- Presenting definition of *purpose* Questions: - What is an example of an intervention you use to improve purpose of students? • What does this intervention look like? • What is needed to promote students' purpose in this intervention? • How do you execute this intervention? • Why are these characteristics/ procedures important?
60-85	Significance	- Presenting definition of *significance* Questions: - What is an example of an intervention you use to improve significance of students? • What does this intervention look like? • What is needed to promote students' significance in this intervention? • How do you execute this intervention? • Why are these characteristics/ procedures important?
85-90	Conclusion	- Questions? - Thanking participants for participating - Share the importance of the content participant by explaining the next steps in the thesis project - (Stop recording)

Table 1
Structure codes (Dimension x Component)

Dimension	Description	Component	Abb.	Freq.
Coherence	People make sense of their identity, capabilities, worldview and develop capabilities.	Characteristic	CoCha	3
		Procedure	CoPro	88
		Argument	CoArg	54
Purpose	People work, monitor, and evaluate their progress towards their purpose.	Characteristic	PuCha	0
		Procedure	PuPro	55
		Argument	PuArg	19
Significance	People evaluate and experience their personal value.	Characteristic	SiCha	3
		Procedure	SiPro	38
		Argument	SiArg	21

Table 2
Content-related codes from the framework of design principles for MIL interventions in education

Cat.	Code	Description	Examples	Abb.	Freq.
Consciousness	Develops cognitive, emotional, and behavioural capabilities	Statements about activities that are aimed at developing cognitive, emotional, and/or behavioural capabilities	"We facilitate an environment within which they learn to share. Because sharing is healing."	CO1	17
	Promotes awareness of existing cognitive, emotional, and behavioural capabilities	Statements about activities that are aimed at improving awareness of existing cognitive, emotional, and/or behavioural capabilities	"We played the Values Board game, so that students got an idea of their values" "We have a toolbox of different theories, assignments, to help students view themselves from a different perspective"	CO2	80
	Promotes awareness of the value one's capabilities have	Statements about activities that are aimed at improving awareness of the value capabilities have	"She knew he was good at X and asked him to help her with X" "When students sense their talents, they suddenly think 'this is apparently what I am worth …"	CO3	18
	Promotes awareness of one's purpose	Statements about activities that are aimed at improving awareness of one's purpose	"By doing X, student learned what they intrinsically wanted to contribute in the world"	CO4	8
Time	Stimulates reflecting on and connecting past, present, and/or future experiences	Statements about activities where students reflect and connect past, present and/or future experiences	"Find a metaphor that states what growth you have made and what growth you still wish for yourself"	TI1	5
	Stimulates understanding of commitments in	Statements about activities where students reflect and	"A guided visualisation... you were going to look at yourself	TI2	6

	the past, now, and/or what might be in the future	connect past, present and/or future experiences	what you're doing in 10 years or in 20 years' time"		
	Stimulates understanding of what signifies for them in the past, present and/or future	Statements about activities where student discern what signifies for them in the past, present and/or future	"We reflected on what childhood experiences provided them with a sense of worth"	TI3	0
Doing	Structures intrinsically motivated short-, mid-, and long-term goals	Statements about activities where students structure short-, mid-, and/or long-term goals	"Students thought of goals and organised them based on deadlines" "We ask of students to formulate three SDG challenges based on their Ikigais"	DO1	5
	Provides strategies to develop plans	Statements about activities where students formulate strategies to develop feasible goals and implementation plans, and ways to evaluate and monitor their process	"Students developed a Business Model canvas for their project" "They got a home assignment at all times, so into the next session they you can share their progress"	DO2	34
	Creates opportunities for goal execution for a longer period and in authentic learning environments	Statements about activities where students work on purpose in curricula for a longer period and in authentic learning environments	"First students develop a personal brand passport; this is a basis for students' conscious businesses which they develop in the next step" "They have to find a business together for the consicious business analysis project"	DO3	5
	Provides evaluation of contributions to shared goals in authentic learning environments	Statements about activities where students reflect on their contribution in authentic learning environments	"Students and other stakeholders together reflect on what they did to improve the neighbourhood in Deventer"	DO4	0
Self	Provides opportunities for responsibility-taking in the program	Statements about students taking on roles in program, or have parts of the program for them to fill	"Students organised a guest lecture"	SE1	2

	Promotes autonomy of participants	Statements about didactical behaviours and approaches to promote students autonomy	"Teachers ask questions to help students in their decision-making process" "Student are provided with tools they could utilise in their projects"	SE2	50
	Includes personal encouragement	Statements about activities in which student are encouraged	"Students tell each other something nice based on their first impression, about what they think the other has the minor got to offer"	SE3	12
	Provides evaluation opportunities	Statements about activities in which students evaluate their development	"After the task, we reflected on what we experienced and what this means for each other's development"	SE4	33
Others	Includes individual learning opportunities	Statements about activities in which students do task on their own	"Student journaled they learning journey" "Students we challenged individually"	OT1	21
	Includes collaborative learning opportunities	Statements about activities where students collaborate	"Students share their thoughts, ideas, views, and insights about an (previous) assignment" "Four students worked on a business case"	OT2	56
	Brings participants into contact with others	Statements about activities in which students get in touch with others outside the school, such as stakeholders, persons of interest, etc.	"Each student is tasked to get in touch with at least 3 business leaders"	OT3	5
	Includes opportunities for sharing successes and setbacks	Statement about activities in which students monitor their progress by sharing successes and setbacks	"We share successes at the start of each session" "In dialogues, students expressed their needs for help"	OT4	26
	Includes opportunities for publicly addressing desired achievements	Statement about activities in which students publicly address what they want to achieve	"Students shared with the other students what they want to learn in their pitch"	OT5	9
	Includes opportunities for participants to take on roles that	Statement about students executing roles that contribute to the	"Each students has a buddy, a fellow student"	OT6	6

	contribute to the development of fellows	development of their fellow students	"Student A is great at accounting, Student B is great at marketing. They helped each other with their tasks."		
	Includes teachers as role models Added; not from theory	Statements about activities in which teachers model behaviour to students	"A personality that all three of us I think have, that you see positivity in people" "We share examples from our own lives with students"	OT7	8

9.3 Appendix III: Instrument and Codebook Evaluation & Reflection Phase

Interview Outline
Overview

Participants	X
Selection	Purposive sampling
Method	Expert appraisal
Duration	60 minutes
Recording	Video
Aim	The main aim is to validate the soundness and feasibility of the design principles.
Prep	All participants were provided with the theoretical underpinnings and the design principles beforehand

Interview scheme expert appraisal

Time	Topic	Questions
0-5	Introduction	- Deelnemers bedanken voor deelname - Vraag of participanten nog vragen heeft voordat we starten - Vraag toestemming om op te nemen **(opname starten)** - Doel en structuur van expert appraisal toelichten - Korte toelichting ten aanzien van design principes
5-15	Coherence	Soundness (i.e., alignment underlying construct with principles) - What is your perspective on the alignment of the theoretical underpinnings for coherence and its design principles? o How complete is the theoretical justification for these design principles? (i.e., theoretical framework) o How complete is the practical justification for these design principles? (i.e., arguments in design principles) o What is missing in the design principles for coherence from a theoretical point of view? Why? - To what extent do you expect these design principles to contribute to coherence? Why? o To what extent do you expect these coherence design principles to contribute to students' sense of MIL in education? Why?
15-25	Purpose	Soundness (i.e., alignment underlying construct with principles) - What is your perspective on the alignment of the theoretical underpinnings for purpose and its design principles? o How complete is the theoretical justification for these design principles? (i.e., theoretical framework) o How complete is the practical justification for these design principles? (i.e., arguments in design principles) o What is missing in the design principles for purpose from a theoretical point of view? Why? - To what extent do you expect these design principles to contribute to purpose? Why? o To what extent do you expect these purpose design principles to contribute to students' sense of MIL in education? Why?

25-35	Significance	Soundness (i.e., alignment underlying construct with principles)
		- What is your perspective on the alignment of the theoretical underpinnings for significance and its design principles?
		  o How complete is the theoretical justification for these design principles? (i.e., theoretical framework)
		  o How complete is the practical justification for these design principles? (i.e., arguments in design principles)
		  o What is missing in the design principles for significance from a theoretical point of view? Why?
		
		- To what extent do you expect these design principles to contribute to significance? Why?
		  o To what extent do you expect these significance design principles to contribute to students' sense of MIL in education? Why?

35-50	MIL	Overall perspective on underlying constructs
		- What is your view on the alignment between the design principles of the three dimensions?
		  o What is your perspective on integration of design principles covering multiple dimensions? Why? How?
		
		Feasibility (i.e., applicability in context)
		- What is your perspective on the applicability of the design principles in the Dutch Higher Education context?
		- To what extent do you think are the design principles applicable to teachers in education?
		  o What are the (perceived) advantages for implementation?
		  o What are the (perceived) disadvantages for implementation?
		  o What would be the easiest design principle to implement?
		  o What would be the hardest design principle to implement?
		- What do teachers require to implement these design principles?
		  o What changes must be made in the design principles framework to increase the chance that interventions based on these design principles contribute to students' experiencing MIL in education?

50-60	Conclusion	- Deelnemers bedanken voor deelname - Vragen? - Deel het belang van de inhoud deelnemer door de vervolgstappen in het thesisproject uit te leggen - (Stop opname)

Codebook

Segment	Cat.	Code	Definition	Example	Freq.	# of p.
Soundness	All three dimensinos	Descriptions of Procedures	Statements about concerns and ideas for improving procedures' descriptions	"Sometimes the procedures seem to be kind of suggestions or possible ideas for doing that. So I think writing in a more abstract way can help to match that as well because then they are not, how do you say, options or ideas but just prescriptions of that's what you can do like that."	30	3
		Theoretical distinction	Statements about the theoretical distinction between categories of design principles	"And how do I say that, what I'm kind of looking for is making the distinction here helpful, so implementing the theoretical distinction that is there in the design principles, is that helpful or is that an artificial distinction."	12	2
		Tool-oriented	Procedures being too tool-oriented and omitting the relationship towards MIL	"And then the question of whether you compliment each other every now and then is not really that important. That is yes, those are tricks and manners, while what matters is that you create that atmosphere of trust and that everyone who participates in education has the feeling that I am just sitting here, I am part of the group."	5	3
		Overlap between dimensions	Statements about overlap between the three dimensions	Expert 1: But in any case, it does feel like that a framework of coherence and purpose at those points is very logical and .. that bit of significance that it feels a little more, well, illogical or less explicit there. Expert 2: R: No, I think all three are very important. And when I see them like that they are also already nicely together, with the addition to broad interpretation of significance.	5	3
		Practical justification	Comparisons between design principles and	"In the education that I am particularly involved in, transdisciplinary education as	22	4

			practical experiences of experts	also done a lot in the university college for a while, identity formation is very important. And you see that yes that the search for coherence is indeed one of the big questions of students. So that it should also be forced actually to think about what kind of professional I am or what kind of researcher."		
	Significance	Concept developing	Comments on the conceptualisation of significance	"in itself, if you look at the design principles that fall under [significance] I think they are quite relevant things to work on in your education but the question of does that really connect with significance, I just find that a more complicated one at this point."	10	3
Feasibility	Adolescents	Applicability for Adolescents	General comments about the applicability of design principles to adolescents	"I think you can go quite far with that, but these are comments that I also hear a lot from colleagues, how can you ask your PABO students these kinds of questions and they can't answer them, or they are too young for that, I think, yes, but I have also worked in secondary education and I ask children of 12 exactly the same questions."	10	4
	Teachers	Applicability for Teachers	General comments about the applicability of design principles to teachers	"I think most of the ones you mention, yes, should just be applicable. I think that process underneath it gets a bit trickier."	12	3
		Capacities of teachers	Comments about (the development of) suitable capacities	"And I can well imagine that this type of education requires a very different kind of guidance. Can't imagine that I'm sure. Requires a very different type of guidance than some other forms of education…"	12	4
		Required support for teachers	Ideas to improve the usage of principles by providing guidance	"I don't see this as some kind of manual that you can just put on your desk and you go by yourself at your computer then go through all this and you have created a new design. So you	5	3

				have to I think live it through with each other to be able to make a design based on these design principles. And of course you can do that living through it in different ways. I actually think the best way then is to do it together with others."		
		Advantages of design principles	Comments about the advantages of these design principles for teachers	"Yes, I do think it helps in making very complex and partly elusive concepts more tangible…"	3	2
		High number of design principles	Comments on number of design principles and ideas to minimise the number	"Design principles are point one (1) a lot ... After all, nobody can design something based on I'll say 20 criteria because you never have 20 of them in your head at once. Whereas 5 core concepts that might then have some sub-denominations more under them is easier to take in your head."	7	2
		Framing of design principles	Comments on the framing of the design principles to teachers	"Maybe that's a risky thing but that has to do with the framing of in what way you then send it out into the world. Yes, I think you have to be careful in that framing that it's not like this is some kind of holy grail that we should always and everywhere and as a starting point or as a guide."	5	2