Design principles for interventions aimed at enhancing higher education honors students' well-being

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Abstract
Students who experience high well-being are better able to develop themselves and perform within their educational program. Personal resources can be developed with interventions and more developed personal resources can contribute to well-being. However, it is not yet sufficiently clear what these interventions should look like to be effective. Therefore, this study focuses on formulating design principles for interventions aimed at developing four personal resources of honors students: self-efficacy, optimism, inquiry mindedness, and self-regulation. Data were collected via focus groups. Data showed that design principles for interventions to develop those four personal resources differ somewhat, but also have several aspects in common: they combine group and individual activities, students are taught basic skills to help them directing their own development, they have an ongoing character and consist of recurring activities. The design principles can be used to design interventions to enhance honors students' personal resources. Further research is needed into the design and effects of these interventions and possible generalisation of the design principles to other contexts.

Keywords: honors education, well-being, personal resources, design principles, interventions

1. Introduction

The years students spend in higher education, are years of many new experiences and major personal development (Van der Zanden, 2019). This makes students sensitive to problems concerning their well-being, whereas positive well-being can make a considerable contribution to students' optimal development (Brooker & Woodyatt, 2019), and increases the chance of studying successfully (Chang et al., 2019; Chattu et al., 2020). It is therefore important to pay attention to the well-being of all students and this attention is increasing worldwide (Macaskill, 2013). One way of focussing on the well-being of students is by enhancing the development of their personal resources. Personal resources are important factors for stimulating students' engagement (Ouweneel et al., 2011; Siu et al., 2014) and can be developed through the use of interventions (Feldman et al., 2015). Whereas interventions to support students' well-being are often used within higher education, a systematic review of these interventions has shown that there is not enough evidence-based knowledge about how to design effective interventions or about potential effects of these interventions ('t Mannetje et al., submitted). There is a lack of experimental studies or effect studies in this field. Designing evidence-based interventions and gaining insight into the effectiveness of these interventions through structured research could lead to more understanding of effective interventions. The design and further development of interventions can benefit from an educational design research approach, in which the formulation of design principles is an essential element, and where the design of interventions and knowledge development go hand in hand (McKenney & Reeves, 2019; Van den Akker, 1999). Design principles make theoretical insights practically applicable to use as a basis in the design of interventions and are continually improved based on practical findings (Van den Akker, 1999). Design principles for interventions to develop students' personal resources do not appear to exist yet. Therefore, this study focuses on generating design principles for interventions to enhance the well-being of higher education students, through the development of personal resources.

1.1 Well-being in higher education

Well-being can be defined as a positive state -emotionally, psychologically and socially- in which persons are able to realise their potential and to be productive ('t Mannetje et al., submitted; World Health Organization, 2004; Westerhof & Keyes, 2010). I t can help to map out the factors that play a role in student well-being in a model. When considering education from the Job Demands-Resources (JD-R) model (see Figure 1), several factors appear to play a role in student well-being. In line with this model, positive well-being is defined as both a low degree of dimensions of burnout and a high degree of dimensions of engagement (Bakker & Demerouti, 2008; Demerouti et al., 2001; Schaufeli & Bakker, 2004). Therefore, just remedying problems and mental disorders is not enough to work on students' well-being; the positive side of well-being must also be given attention. The JD-R model describes several factors, both personal and environmental, that can function as a resource or demand. The presence of many demands combined with the absence of sufficient resources increases the risk of decline in well-being. Although the interrelationships between different types of demands and resources in the JD-R model need further research in different contexts (Bakker & Demerouti, 2017), research shows that personal resources contribute to study engagement (Ouweneel et al., 2011).
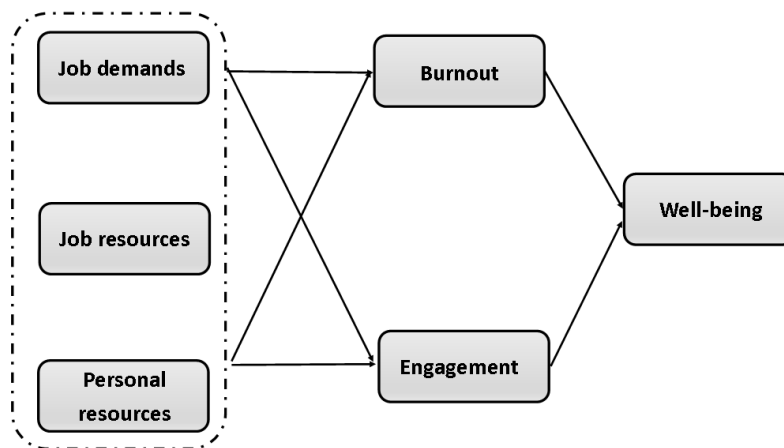
Figure 1: The Job-Demands Resources Model. Based on Schaufeli (2017)

1.2 Developing higher education students' personal resources.
Personal resources (e.g. self-efficacy, optimism) are developable aspects of a person that can contribute to optimal functioning and well-being (Ouweneel et al., 2011). Based on the combination of two common definitions of personal resources (Hobfoll et al., 2003, p. 632; Van den Heuvel et al., 2010, p. 129), this study defines personal resources as *'developable, positive beliefs of aspects of one's own personality concerning the ability to control and impact the environment, which motivates and facilitates goal-attainment.'* ('t Mannetje et al., 2021). Students' personal resources can help them cope with the demands of their education and extra-curricular activities (Feldman et al., 2015). Interventions can be deployed to develop students' personal resources (Luthans et al., 2014; Van Houten-Schat et al., 2018).

This study focuses on the development of the personal resources optimism, self-efficacy, self-regulation, and inquiry mindedness, since previous studies have shown the added value of these personal resources for students' well-being and optimal functioning ('t Mannetje et al., 2021; Ouweneel et al., 2011). These personal resources fit in well with the goals of higher education in general, and honors programs in particular. The context of extracurricular honors programs has been chosen for several reasons. On the one hand, these programs offer room to experiment with new forms of education (Wolfensberger et al., 2004). On the other hand, students in these programs may experience extra pressure because of the additional program they are following, which may make them sensitive to well-being related problems. At the same time, they generally manage to deal well with these extra demands, which could possibly be partly explained by their use of personal resources.

Optimism and self-efficacy have previously been researched together. The added value of optimism and self-efficacy for academic performance of high school students (Carmona-Halty et al., 2018) and university student engagement (Siu et al., 2014) has been demonstrated, and these two resources were developable via interventions in diverse work contexts and a few, not described in detail, school contexts (Luthans et al., 2014). In our study, optimism is defined as 'the belief that good things will happen' (Luthans & Youssef,

2017; Ouweneel et al., 2011) and self-efficacy is defined as 'believe in your own abilities to perform a specific task in a specific context' (Chemers et al., 2001; Luthans & Youssef, 2017). Self-regulation refers to thoughts and actions of a learner, oriented to a learning goal (Schunk & Zimmerman, 2012). In this study, self-regulation is defined as 'the ability to plan, monitor and evaluate one's thoughts, feelings and actions proactively, to achieve one's goals under changing circumstances' (Durand-Bush et al., 2015; Zimmerman, 2000). Previous research has shown the link between the degree of self-regulation and well-being among higher education students (Durand-Bush et al., 2015; Park et al., 2012; Slotboom & Gravesteijn, 2020), and self-regulation appears to be developable (Park et al., 2012), for example via interventions (van Houten-Schat et al., 2018).

The last personal resource included in this study is inquiry mindedness. This concept in itself is relatively new, but parts of inquiry mindedness, such as curiosity, were earlier demonstrated to be connected with higher education students' well-being (Robayo-Tamayo et al., 2020). Inquiry mindedness is in this study defined as 'an overarching term for qualities such as curiosity, reflective behaviour, and critical thinking skills' ('t Mannetje et al., 2021). Moreover, inquiry mindedness or aspects of it seem to be developable (Andriessen, 2014; Mastenbroek, 2014).

1.3 Design principles as basis for interventions

As the systematic reviews by 't Mannetje et al. (submitted) and Deunk and Korpershoek (2021) show, the evidence base for interventions to support higher education students' well-being can be improved. As a result of lacking an evidence base, the extent to which interventions build on previous insights and experiences and the extent to which interventions are effective is unclear. Following the steps of educational design research, a first step in the development of evidence-based interventions is the formulation of design principles. As far as we know, general design principles for designing interventions to develop the aforementioned personal resources are lacking. On the basis of design principles, educational designs can subsequently be made and during testing and implementing the design principles are elaborated further (Herrington & Reeves, 2011). This is part of an educational design research approach that ensures that knowledge development and practical application go hand in hand (Van den Akker, 1999). To formulate design principles, the purpose of the design, and the characteristics and procedures for the design have to be clear (McKenney & Reeves, 2019).

1.4 Purpose of this study

Our study is based on the involvement of different groups of stakeholders, including students, to establish design principles for interventions to develop students' personal resources. We aimed to answer the following research question:

"What are the design principles for interventions to enhance honors students' personal resources self-efficacy, optimism, inquiry mindedness, and self-regulation?"

2. Methods

2.1 The context of honors programs

This study focuses on participants of honors programs, additional programs that students follow next to their bachelor's program. As Plominski and Burns (2018) indicate, data are contradictory whether or not more talented students are more or less at risk of well-being related problems, and there is little research into the mental health of honors students (Pham, 2017). Although there are studies that show better well-being among students in honors programs than among non-honors students (Plominski & Burns, 2018), there are several factors that make extra attention for the well-being of honors students seem worthwhile. First, in the European context -at least in the Netherlands- students mostly participate in an honors program parallel to their regular curriculum (Van Eijl & Pilot, 2019), which requires extra effort from students. Second, cognitively more able students appear to be less easily satisfied (Griffioen et al., 2018). At the same time, comparative research between honors and non-honors students shows that honors students demonstrate better well-being on several indicators, although it should be noted that this research was conducted in a setting where honors education was not an extra program besides the bachelors' program, but an integrated part of the curriculum (Plominski & Burns, 2018). In addition, honors education is often seen as a testing ground for experimenting with educational innovations. This makes it possible to try things out in these programs, which may later be transferred to the entire higher education system (Wolfensberger et al., 2004).

2.2 Formulating educational design principles

By involving people from educational practice, design principles can be developed that fit the context (Herrington & Reeves, 2011). Formulating design principles can help to guide educational designers to make well-considered decisions based on general knowledge and insights (Kali et al., 2009). Two methods are frequently used for formulating educational design principles: the CIMO logic (Denyer et al., 2008) and structure of design principles by Van den Akker (1999). Both explicitly take the context into account, which is important to establish design principles with a high probability of designing successful interventions. The CIMO logic describes the context (C), interventions (I), mechanisms (M) and outcomes (O) in design principles (Denyer et al., 2008). In formulating design principles following the structure of Van den Akker (1999), the emphasis is on describing the characteristics of an intervention, the procedures for carrying it out and the arguments on which it is based, where the desired outcomes are always taken as a starting point. An important difference between the two methods is that CIMO also focuses on mechanisms, which are on a more abstract level. Van den Akker pays more attention to procedures on a concrete level. Moreover, arguments for the possible effects of designs are also included in the formulation of design principles following Van den Akker. Because of the very practical level, in this study we choose to use Van den Akker's system. A design principle then has the following structure (Van den Akker, 1999):

If you want to design intervention X [for the purpose/function Y in context Z], then you are best advised to give that intervention the characteristics A, B, and C [substantive emphasis], and to do that via procedures K, L, and M [procedural emphasis], because of arguments P, Q, and R'. (p. 9)

In order to achieve good quality and applicable design principles, it is valuable to involve the perspectives of various stakeholder groups when formulating design principles (Könings et al., 2014). In addition, involving students gives them the opportunity to make a constructive contribution during the design process, partly based on their learning experiences, in order to create a relevant design (Bron & Veugelers, 2014), which is also called co-creation (Bovill et al., 2016). This also matches with one of the characteristics of honors programs, to give space to good ideas coming from students (Van Eijl et al., 2017).

2.3 Focus groups

In order to answer the research question and to formulate design principles, focus group interviews were carried out. A group interview is a good way to generate ideas (Baarda et al., 2018). These focus group interviews took place over a three-week period in January and February 2021. The focus groups were organised online, synchronous, via Microsoft Teams, since it was not possible or allowed to have them take place physically because of the Covid-19 situation. As a result, participants could easily participate from different places. The conversations were led by an experienced moderator (MH). The moderator made sure that, following the moderator guide, the discussion stayed on track by following a topic list, facilitated the discussion and ensured an equal opportunity for contributions between participants, which is important according to Greenbaum (1998). In addition, one of the researchers (JM) was present during the focus groups as a non-participating observer, for technical issues and to regulate the chat. The content of the various focus groups is set out under 'procedure and instruments'. With the permission of the participants, all sessions were video-taped. All participants signed an informed consent form, following the guidelines of the institutional ethical advisory board.

2.4 Procedure and instruments

For each of the three heterogeneous focus groups, data were collected in two sessions. This allowed participants to get to know each other first and to create a safe environment, to get used to the online focus group discussions and that there was enough time to discuss all the topics. For both rounds of focus groups, there was a semi-structured interview guide. In line with Huberman and Miles (2002), the first meeting focused on an exploration of the core concepts, including defining well-being and the different personal resources. The main aim was to further define the personal resources and discuss the possibility to develop them within the specific context of honors education. The first focus group started with a short introduction, after which participants could briefly introduce themselves. The discussion started with the definition of well-being derived from literature that was used in this study, and the participants were asked to react to this definition. Then the personal resources were discussed one by one starting with a definition of the resource, after which the participants were asked if they could give an example of this resource, to what extent the resource is important in and can be developed within honors education, and how this development can be shaped. After the first round of focus group discussions all participants received a short summary in preparation for the next focus group.

The second session was planned for two weeks later. This time span, on the one hand, was long enough for the researchers to conduct a short analysis and wrap-up of the first session, and on the other hand, was short enough for the participants to have the information from the first sessions still in their minds. After some procedural information, the second focus

group discussion focused, based on the definition of the personal resources as formulated in the first session, on the formulation of design principles. For the outline of the educational design principles, we used Van den Akker's (1999) system. For each personal resource, participants were asked to give an example of an intervention to develop this resource. Per personal resource, several possible interventions could be discussed, after which the moderator moved on to the next personal resource. The discussion focused on what an intervention to develop one particular personal resource could look like. The *characteristics* and *procedures* that are important for an intervention and the *arguments* were discussed successively. Respondents could complement, contradict or challenge each other's answers. In the sessions, respondents appeared to mostly complement each others' examples and arguments. Because the number of personal resources to be discussed was determined by the time available, all sessions actually lasted about 90 minutes. The order in which the personal resources were presented in the different groups was altered to reduce the risk that the sequence in which the personal resources were presented influenced the answers given.

2.5 Participants
In order to collect a wide range of insights and to increase the probability of the design principles fitting the context (Herrington & Reeves, 2011), it was decided to involve various stakeholders with different roles in the organisation. As such, the different stakeholder groups distinguished were students, teachers, educational directors, student supporters and educational specialists. Convenience sampling was used for the selection of the participants in the focus groups (Patton, 1987). From a list of people (not in alphabetical but in random order) involved in honors programs, every first teacher and first student per program were invited, except when it concerned a non-Dutch speaking person. In that case, the next person on the list was approached. As the honors programs at the institution under study are linked to different disciplines, participants from different disciplines (technology, health and economics) were involved in the various focus groups. Educational directors were randomly selected from a list of all educational directors. The focus groups were heterogeneous with students, teachers, student supporters, and educational directors from one university of applied sciences as well as some other educational experts from different higher educational institutions within the Netherlands. These educational experts from outside the institution were selected for their specific expertise in the field of student well-being, and were purposefully selected. The researchers' own networks were used to invite educational specialists from other institutions, by sending direct invitations and by placing a general call on a professional digital network.
Participants could choose from a list of options which time was most convenient for them. In this way the highest possible participation rate was promoted. Table 1 shows the division of participants by group. In the first round all respondents were present, in the second round two respondents were absent.

Table 1. Composition of the focus groups

Focus group	N	Roles/functions
1	8	1 student (economics)
		3 teachers (economics, management)
		1 manager (engineering)
		1 educational support staff
		2 external educational specialists
2	10	3 students (behavioural sciences, management, economics)
		3 teachers (education, management, economics)
		2 educational support staff
		2 external educational specialists
3	8	1 student (economics)
		2 teachers (behavioural sciences, other)
		3 managers (economy, behavioural sciences, other)
		2 educational support staff

2.6 Analysis

The recordings of the focus groups were transcribed verbatim. Further analysis was done using ATLAS.ti software. Since the first round of focus group discussions was primarily used to introduce participants to the central concepts in this study and to explore the concepts together based on definitions from literature, the transcribed data from the first round were not included in the analyses, because they did not directly contribute to answering the research question.

The data from the second round of the different focus groups were coded on the basis of the components of design principles; characteristics, procedures, arguments. All steps in the coding process were done independently by the first (JM) and second (MH) author and consensus was reached after discussion. In the first round of coding, the level 1 coding, it was indicated for each fragment whether it contained information on characteristics, procedures or arguments of the different personal resources. After that, in level 2 coding, content-related codes were assigned to, for example, the type of interventions, the content of the interventions, and the type of guidance. Each fragment thus received at least two codes. The code book and frequency of these codes are shown in Appendix A. The preliminary code book was expanded with new codes during coding.

After coding all data, the information from the various focus groups was then combined to formulate design principles. For each cluster of fragments, it was determined which characteristics were most important according to the participants in the three focus groups together. The first and second author (JM and MH) identified the most important characteristics together, based on the transcription and coding of the data. By weighing and discussing the content from all focus groups, both the content that came up in only one focus group but received a lot of support, and content that was mentioned in several focus groups, could contribute to the formulation of the design principles. For each important characteristic, corresponding procedures and arguments were then described. It was possible to formulate several procedures or arguments per characteristic. The aim was to incorporate all relevant ideas from the focus groups into useable design principles.

During the process of formulating design principles, codes related to one-time or continuous character of the intervention, mandatory or voluntary attendance, and being provided inside or outside the school setting were moved from procedure to characteristics. This was found to say more about characteristics of interventions than just procedures for implementing interventions. An example of how data from the focus groups were used to formulate design principles is shown in Table 2. The first author (JM) initiated the formulation of all design principles, which was then completed and discussed together with the second author (MH). This resulted in a list of design principles for each personal resource, describing the main characteristics, associated procedures and arguments. Subsequently, both the preliminary and final design principles were discussed with all authors collaboratively, to provide comprehensible, concrete and practically applicable design principles.

Table 2. Steps from data to formulated design principles; an example of the formulation of a characteristic of design principles to develop 'self-regulation'

Quote	Derived from focus group	Resulted in design principle
It is a skill that you learn in steps. So a lot of shorter loops, a lot of working with sprints, that you reach your goal quickly and in that way, you experience all the time that you succeed and it is through that experience, then your self-regulation follows at some point.	2	….focuses on taking control of students' own learning process and setting short-term goals, by working on students'. own personal learning goals and helping them in the steps they can take to achieve their goals, so they can also experience success in formulating and achieving their goals.
I think what [name] said about the little loops, I think that is especially important for being able to have success experiences as well.	2	
And with that they learn, playfully, to choose a goal together. And what we always do, when the meeting is over, is: well, what was your goal? Did you achieve it? How did you work towards it? Did everything come as intended?	2	

So safely seeking a goal together and achieving a goal.

We expect a lot from students in the sense that they structure themselves, plan, self-regulate, things like that, and I think if you start a bit smaller and get an experience that works, that you extend it after that. So I think that it should be offered in a more structured way in the beginning.	2
Well, when it comes to goal setting, I immediately think of the goal setting program at [name]. And there they encourage students to set their goal and they have all kinds of advice they give.	2

3. Results

First, an impression is given of the focus group discussions and the way the themes were discussed. After that, we present the design principles formulated for each personal resource. During the focus group discussions, it was noticeable that the various participants generally agreed with each other. When someone gave an example and others reacted to it, this was mainly an addition and not a contradiction. Participants themselves regularly ensured that the suggestions they made were verified, by asking the participating students whether they felt the suggestions matched the wants and needs of honors students. An illustrative example is given in the following quote:

Participant: "Yes, I have another question for (name student) (…) And do you find that too vague or are those things that you do? Or what is actually going on here and what kind of solution should we be able to come up with for this situation?"

It was also noticeable that the participants often focused on the characteristics of possible interventions -mainly the content- and on arguments why this would work. The moderator had to ask more questions in order to gain insight in the procedures. An example of this is shown in the following quote:

Moderator: "So, how should that be done in your opinion?"
Participant: "You should make students think about what they have done and what effects it has had. That can be done in a formal way. You can also do that in a very informal way."

Third, it was noticeable that the participants were well able to give examples of possible interventions, mainly from their own experiences. At the same time, a kind of natural saturation occurred when several examples of interventions for developing a certain personal resource were given. The moderator did not have to cut off the discussion, but could naturally move on to the next personal resource. In this way, all suggestions for interventions relevant to the participants could be discussed.

3.1 Design principles to stimulate personal resources
The design principles for stimulating the various personal resources of honors students are shown in Tables 3 to 6. For each personal resource, the characteristics of an intervention, the procedures for carrying it out and the arguments for doing so are indicated. Here, one characteristic can be elaborated by several procedures or arguments.

As can be seen from the tables, there are several characteristics that are similar in the design principles for multiple personal resources, for example the delivery method, which for all personal resources is ideally group-based or a combination of group-based and individual. However, there are differences in the corresponding procedures and arguments where, for example, for optimism the expected added value lies primarily in the motivational aspect, while for inquiry mindedness the emphasis is more on *learning from each other*. The continuous or integrated offering of activities is also common to all personal resources, although the design principles do vary in the extent to which activities should really be integrated or should mainly return regularly or be linked to habitual actions. Also, practising skills is an important characteristic of interventions for almost all personal resources. There are also differences in characteristics between different personal resources.

Table 3. Design principles: self-efficacy

If you want to design an intervention to promote self-efficacy of honors students, it is recommended that the intervention	Characteristics	Procedure	Arguments
	is offered in a group	where students work together on an assignment, make plans together	so that students can learn from each other
			and become more aware of their own qualities in comparison with others
	is a combination of group and individual activities	where what is learned in the group can be translated into personal learning questions	so that students translate the learning experiences in the group to their own learning process
		where differences are appreciated	so that students learn to believe in their own abilities
	gives students insight into the processes in their brain and teaches them how they can influence these processes	by giving students insights and teaches them what kinds of help they can make use of	so that they are understanding their own behaviour and reactions better

	focuses on practising skills such as goal setting and seeking support	to enable students to practise and gain insights in a safe setting	so they get more tools to increase their self-confidence
			because by experiencing it, they notice what it does to them
	focuses on learning to reflect	and give students the opportunity to put the insights they have gained into practice	so they immediately get the opportunity to take new steps
		whereby students learn to appreciate differences	so they start to see a different approach as valuable and develop confidence in their own abilities
	has a positive focus	starting from what goes well and what someone's qualities are	in order to get the strength of an individual clear
		and also to reflect on what went well	so that students will regard experiences as learning moments
	is integrated into the curriculum and not offered separately	in which working on gaining insight into students' own abilities is interwoven with content-related assignments	so students can continually apply and develop their self-efficacy

As shown in Table 3, the design principles for developing self-efficacy mainly focus on giving students an insight into mental processes and teaching them skills, such as reflection and goal setting, so they can work on their self-efficacy through practice.

Table 4. Design principles: optimism

If you want to design an intervention to promote optimism of honors student, it is recommended that the intervention	Characteristics	Procedure	Arguments
	is offered it in a group	where students give each other new perspectives	so they are motivated by each other to stay involved
		in which students are jointly responsible for the design of activities	to motivate them to work on activities they consider important
		in which a competition element can also be considered	to stimulate students to do their best and go for it
	is a combination of individual and group activities	in which students work on their own goals and help each other within the group	
	is partly individual	in which students become aware of their own talents and thoughts	so they really get to work with their own questions
		by, for example, filling in a talent test individually and then being coached on how to put this to work	so they learn how to deal with their strengths and weaknesses
		in which reflecting on themselves is also central	so they gain insight into their own development goals
	takes place in an out-of-school setting	such as an artistic environment or outdoors	because students can look at things differently in a different environment
	includes exercises to learn to think positively	where students can practise in a safe environment	to make them able to think more in terms of possibilities

			because people are often inclined to see mainly problems
		where use can be made of exercises from existing training and therapies, such as a positivity diary and ACT	to steer their brain towards positive thinking
	is attended voluntarily by the students	where their intrinsic motivation to develop themselves is stimulated by showing possibilities	so students can choose forms that suit them
	will be carried out by teachers who are able to be a role model and coach students	in which teachers show an optimistic and developmental attitude	so that students gain confidence in their own strengths
	is a continuous part of the program	in which activities can be linked to regular routines or components	because repetition will have a real effect on optimism

The design principles for designing interventions to further develop optimism (see Table 4) emphasise the importance of individual components within interventions, in which students can work on their own goals and gain insight into their own talents. This involves a combination of stimulating environments and safe settings.

Table 5. Design principles: inquiry mindedness

If you want to design an intervention to promote inquiry mindedness of honors students, it is recommended that the intervention	Characteristics	Procedure	Arguments
	is offered in a group or in a combination of a group and individual, where the groups should not be too big	where, in addition to group inspiration, there is also room for individual development	so that the group is a safe place and students can learn from each other because in this way students can also be critical on their own thinking

	in which teachers have an important coaching role, and continue to ask questions	to make students think
	in which peers can also act as critical friends, in addition to an individual coach	so that students learn what influence other input can have on their learning process
focuses on practising skills, such as asking the right questions	whereby curiosity and out-of-the-box thinking are stimulated	to make students more creative and stimulate them to think
gives students responsibility and space to determine their own direction	for example, by letting students arrange the content of meetings or by choosing their assignments	so that it connects to their interests and forces them to think about what they want
	in which assignments or issues can also be drawn from the real world	because real issues arouse more curiosity
provides a kind of menu of inspiring examples	by allowing students to take a look behind the scenes of other programs or to have guest speakers	
is not aiming to follow research methods, but allows students to adopt different perspectives	by giving them different roles or viewpoints, for example	so they are forced to think about their own perspective
has a continuous character	where inquiry mindedness is built up step by step	because that way it and becomes a basic attitude

The design principles for interventions to develop inquiry mindedness, as shown in Table 5, mainly focus on teaching skills, such as asking questions, to stimulate curiosity, and giving freedom of choice. Here, it is indicated that students can be inspired by good examples and guest speakers, for example.

Table 6. Design principles: self-regulation

If you want to design an intervention to promote self-regulation of honors students, it is recommended that the intervention	Characteristics	Procedure	Arguments
	is offered in a combination of group and individual or only individual	for example, by working on students' own goals and discussing their development in a group with peers	so that other students can act as peers in students' individual learning process and help them, for example, to step outside their comfort zone
	takes place once or starts with an introduction and then comes back regularly	whereby the introduction could take place outside the school setting or with a short introductory activity	so that students can focus completely on the goal
		whereby the whole intervention can be voluntary or the start compulsory and the rest voluntary	so that people who are not open to it are not forced into it, and people who have a great affinity with it are encouraged to continue
		which can be within or outside the regular lessons	to make the threshold for participation as low as possible
	focuses on taking control of students' own learning process and setting short-term goals	by working on students' own personal learning goals and helping them in the steps they can take to achieve their goals	so they can also experience success in formulating and achieving their goals
		where the teacher takes a coaching role	so that the learning process of the student is central, students have to take initiative and the teacher supports this
	focuses on practising skills	such as goal setting, meditation, physical exercises and setting boundaries	so that students can start small and become more and more experienced

	is based on principles from mindfulness or a strengths-based approach	that contains a moment of reflection	because it makes students very aware of who they are and what they feel
		in which students think about what excites them	because self-awareness can lead to self-reflection, and that is conducive to personal development

As shown in Table 6, design principles to develop self-regulation include a step-by-step approach, where it is important that students learn to set short-term goals and take control of their own learning. Here, it is important that activities recur regularly and that students are taught sufficient skills to self-manage this process. It is also important to reflect on what is happening, for instance through reflection exercises and meditation.

4. Discussion

The purpose of this study was to formulate, grounded in practice and inspired by literature, design principles for interventions to develop four of the personal resources of honors students; self-efficacy, optimism, inquiry mindedness, and self-regulation. Based on the data gathered in focus groups, design principles were formulated consisting of characteristics, procedures, and arguments for interventions. As the results show, the design principles for each of the four personal resources vary, however three overarching principles can be identified: 1) it is advisable to make a combination of group activities and individual activities, 2) students are taught certain basic skills in order to be able to further direct their own development, 3) it is advisable to make interventions ongoing or at least consisting of several activities spread over a longer period. For these overarching design principles, the procedures and arguments varied.

To design interventions to stimulate students' personal resources, it is recommended to establish a combination of individual and group activities. By combining individual and group activities, two conditions often associated with educational effectiveness can be met: autonomy and social belonging. Individual activities are ideally suited for working on one's own personal goals. Moreover, these activities can be matched with the needs and talents of individual students. In this way, the need for autonomy is met, which promotes students' optimal functioning and well-being (Ryan & Deci, 2000), increases the chance for interventions to be successful (Gilbert et al., 2018), and a tailor-made approach can be offered, as recommended in the systematic review by Slotboom and Gravesteijn (2020). Additionally, group activities can help bonding with other students and contributes to relatedness. It is known that feeling part of the community and having a sense of belonging contribute to successful studying (Kiltz et al., 2022; Tinto, 2003).

In addition, the design principles highlight that interventions should focus on teaching students skills that enable them to further regulate their future development. It gives them, in other words, the tools to be able to develop themselves further. This makes the development of self-regulation seem almost a precondition for the development of other personal resources, since self-regulation includes the skills needed to plan, control and work

towards one's goals (Dubuc-Charbonneau & Durand-Bush, 2015). At the same time the skills that, according to the participants in the focus groups, need to be learned are broader than only self-regulation. Skills such as 'asking the right questions' and 'mindfulness' must, according to them, also be taught to students. This indicates that developing personal resources not only requires the development of positive emotions, as previously studied among university students (Ouweneel et al., 2011), but also more practical skills.

A third overarching design principle concerns the duration of the interventions. The focus groups indicate that it is advisable for interventions to consist of several sessions, preferably spread over a longer period and integrated in the curriculum, with various inspiring activities and activities outside the regular school setting. It is also known from previous studies that interventions with a longer duration are more effective than one-time interventions (Bolier et al., 2013; Sin & Lyubomirsky, 2009), that several training sessions spread over a longer period of time (i.e. spaced learning) are more effective than training in immediate succession (i.e. massed practice; Carpenter et al., 2012), and also that honors students consider repeated practice important (Coppoolse et al., 2013). The advantage of interventions integrated in the curriculum is that student participation is likely to be high and that stigma for participation in the interventions is avoided (Dekker et al., 2020), which may improve the effectiveness ('t Mannetje et al., submitted). What remains a point of discussion is to what extent interventions should be offered voluntarily or students should be obligatorily involved in an introductory activity. The design principles for the development of various personal resources do not yet provide a consistent view on this. While voluntary participation may be associated with greater motivation to participate, it may actually lead to low participation of students who can benefit most from support.

Although the design principles for developing each of the four personal resources have been formulated separately, supporting these personal resources in educational practice does not need to be done in isolation. The aforementioned overarching design principles can be used as a starting point, with specific design principles for interventions to develop one of the personal resources as an addition.

Based on our findings, the specific design and content of interventions for each of the four personal resources would be at some points similar and at some points different. Some of the differences and similarities are elaborated further. In order to develop self-efficacy, it is important to give students insight into how they can take control of their learning and to teach students to think positively and reflect. Learning to think positively aligns well with optimism. Besides, because of the aspects of taking control of their own learning, there seems to be a strong link between self-efficacy and self-regulation. In order to develop self-regulation, it is important that students learn skills like how to take control of their own learning process, and setting -short-term- goals for themselves, which is known from research to contribute to motivation needed for self-regulation (Ilishkina et al., 2022).

Several models of self-regulated learning even consider self-efficacy as a variable in self-regulated learning (Panadero, 2017). The design principles for stimulating self-efficacy and self-regulation thus appear to be quite similar. This is not surprising when considering, for example, the work of Schunk and Ertmer (2000), in which they recommend that interventions to promote student self-regulation should focus on two aspects: skills and the

enhancement of self-efficacy. Besides, the formulated design principles from our study emphasise the importance of developing self-regulation regularly and focusing on intensive practice of skills, which is also in line with models of self-regulation in educational contexts (Panadero, 2017). In addition, Zimmerman (2000) indicated that self-efficacy of students stimulates the use of learning strategies. Self-efficacy and self-regulation, both of which can be stimulated through the active use of feedback, together ensure better academic performance (Brown et al., 2016). The design principles formulated in this study provide insight on how to further develop both these personal resources, where possible and desirable in conjunction with each other.

In order to develop optimism, our study suggests that existing instruments such as talent tests and techniques from positive psychology can be used (e.g. Duan et al., 2014; Ghielen et al., 2018), to help students' awareness and positive attitude towards their own qualities. However, it is important that a talent test, for example, is not a stand-alone activity, but part of a program where students also learn what they can do with insights into their talents (Soria & Stubblefield, 2015). Besides, it is important to point out that optimism must be realistic, because unrealistic optimism, having faith in a good outcome where this cannot be expected, even appears to have a negative effect on well-being (Forgeard & Seligman, 2012). Although optimism can lead to more effort being made to achieve the goal even when the task is difficult (Zhang & Fishbach, 2010), only realistic optimism is helpful.

In developing inquiry mindedness, students need to be encouraged to find inspiration and to adopt different perspectives, thus fostering their inquisitiveness and curiosity about other approaches and ideas. Therefore, for the further development of students' inquiry mindedness within higher education, stimulating the attitude of wanting to learn more seems to be a core component. Learning research skills could be a way to stimulate this attitude (Greve et al., 2015). Although inquiry mindedness is still a relatively new concept, research into related concepts shows that people who have a strong need for cognition are strongly committed to learning in general and that stimulating students' need for cognition can contribute to self-regulation (Evans et al., 2003).

Based on the results of the focus groups, educational design principles are formulated for interventions to develop four personal resources in students, in the specific context of honors programs at a university of applied sciences. A logical next step in educational design research is to design interventions based on these design principles (Herrington & Reeves, 2011), and going through an iterative process in which -prototype- designs of interventions are constantly tested and further developed (Nieveen & Folmer, 2013). Therefore, the formulation of design principles in this study is only one of the first steps in a larger process.

4.1 Limitations, implications and future research
The methodology used in this study had some strengths and limitations, which were mainly related to the design of the focus groups. First, this research focused on the context of honors programs at one university of applied sciences, involving respondents in various positions at this institution, which led to input from various perspectives. However, because experts from other institutions also participated, it is likely that the design principles may also fit the context at other institutions offering comparable honors programs. When the design principles are used for designing interventions in other educational contexts than

that of honors programs at the university of applied sciences under study, it is important to first investigate to what extent these contexts are comparable. The design principles may need some adjustment before designing interventions for other contexts because, for example, the pedagogy in honors programs is generally different from the pedagogy within regular education (Wolfensberger, 2012). Moreover, it is always important to take into account contextual factors such as teacher involvement, motivation of students, and the timing of the intervention (Mangan et al., 2020). Research on the effectiveness of new interventions, and further optimalisation of these interventions on the basis of these findings, will increase understanding of workable and effective interventions to promote student well-being, as recommended in a systematic review by 't Mannetje et al. (submitted) among others. The actual validation of the design principles will take place if interventions are designed on the basis of these design principles and these interventions are used in educational practice. In line with Herrington and Reeves (2011), and McKenney and Reeves (2019), it is recommended to further develop the design principles based on these practical experiences and to investigate whether they can also be translated to other educational contexts.

Because honors education is often seen as a testing ground for new concepts that can subsequently be transferred to the whole of higher education (Huijts & Kolster, 2020; Wolfensberger et al., 2004), another logical next step is to investigate to what extent the design principles and interventions designed for the context of honors programs can also be used in other places within higher education. Because honors students do differ somewhat from regular students, they have for example, in general, more cognitive skills than regular students (Huijts & Kolster, 2020), interventions developed for honors students need to be adapted in order to be applicable to the whole of higher education. In doing so, it is important to first verify the design principles and interventions, for example in focus groups, with teachers and students from regular bachelor's programs and ask them to what extent they find them appropriate within regular bachelor's education. This will allow a translation of the insights within honors education into regular education. In this way, students within higher education as a whole can be helped to cope with the demands placed on them in the most effective way.

Another limitation we experienced was that conducting focus group discussions digitally - because of the Covid-19 pandemic- made interaction between participants more difficult, because non-verbal communication is less visible online and both the moderator and participants could therefore not take this into account. An advantage of online focus groups was the very high response rate. Almost all participants in the first round also participated in the second round. Although the focus groups were all heterogeneous in design with several respondent groups, unfortunately in two of the focus groups only one student was represented for scheduling reasons. While these may have been small in number, the moderator and other respondents did provide adequate opportunities for students to give their input. In follow-up research, it would be valuable to involve more students in order to have their input be more diverse and comprehensive. At the same time, it is also beneficial to -continue to- combine student input with input from professionals, because students' learning preferences do not always match the most effective way of learning (Kirschner & Van Merriënboer, 2013).

5. Conclusion

To support students in their development, attention to their personal resources is important. This can be done by using interventions to further develop these personal resources. This study can serve as a first step in creating and using a more evidence-based approach, by means of design principles for interventions. It shows that interventions for the development of honors students' personal resources should, for example, consist of group and individual activities, teach students' basic skills to steer their own development, and be of a continuous character. In addition, there are design principles that apply specifically to the development of one or a few personal resources, such as taking place outside the school setting, or teaching students to reflect. Interventions for honors education can be developed based on the design principles we have formulated. After that, it is important to investigate the effectiveness of these interventions and to further develop both the interventions themselves and the design principles. The design principles formulated here are based on input from practitioners. For further development and refinement of these design principles, it is recommended that experts and theoretical insights on each of the personal resources should also be included. The design principles formulated in this study can therefore serve as a basis for further development, making it easier for students to cope with high demands and develop themselves successfully.

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Appendix A Code book

Table 4. Structure codes level 1

Personal resource	Design principle component	Codes abbreviation*	Number of fragments
Self-efficacy	Characteristics	SEkar	60
	Procedure	SEpro	23
	Arguments	SEarg	15
Optimism	Characteristics	OPkar	38
	Procedure	OPpro	30
	Arguments	OParg	10
Inquiry mindedness	Characteristics	IMkar	31
	Procedure	IMpro	16
	Arguments	IMarg	6
Self-regulation	Characteristics	ZRkar	42
	Procedure	ZRpro	26
	Arguments	ZRarg	12
Overarching		OO	1

* Abbreviations are in Dutch

Table 5. Content codes level 2

Theme	Subtheme	Codes abbreviation*	Number of fragments
Type	Grouptraining/program	TyGro	32
	Individual training/coaching	TyInd	8
	Self-study online or offline	TyZelf	3
	Outside the school	TyBuit	11
	Combination	TyCom	20
	Other	TyOv	4

Content	Learning theory	InTh	9
	Practicing/skills	InOef	33
	Reflection/discussion	InRefl	18
	Take charge	InReg	20
	Short term goals	InDoel	6
	Other	InOv	8
Organisation	Intercurricular	OrgIn	11
	Extracurricular	OrgEx	2
Participation	Mandatory**	DeVp	7
	Voluntary**	DeVrij	10
	Combination**	DeCom	2
Theoretical base	Mindfulness	ThMind	4
	Psycho-education	ThPsy	6
	Talents	ThTal	4
	Positive psychology	ThPP	9
	Other	ThOv	8
	None/not explicit	ThNiet	0
Guidance	Teacher steers	BegStu	1
	Teacher coaches	BegCoa	23
	Teacher as role model	BegRol	7
	Peergroup	BegPeer	6
	Other	BegOv	7
	None	BegNiet	0
Duration	One-time	TijdEen	4
	Some sessions-weeks	TijdEnk	0
	Some months-year	TijdJaa	0
	Continuous	TijdDoor	23
	Unknown/not explicit	TijdOn	0
Arguments	From literature/research	ArgLO	4
	From opinion/feeling/idea	ArgMGI	39
Requirements for teacher		EisDo	1

* Abbreviations are in Dutch

** By definition, participation in these honors programs is voluntary. The coding focuses on whether all participants in the program should be required to participate in the intervention.