EXPEDITION CAREER

supporting graduation students in their discovery of 'what is next?'

M2.1 DESIGN PROJECT
by Laure Smits

wordcount: 4997

Author
Laure Smits

Coach & Examiner
Tilde Bekker

Examiner
Yaliang Chuang

Expert
Mitchell Jacobs

January 10th 2024

Eindhoven University of Technology
Department of Industrial Design

TABLE OF CONTENTS

INTRODUCTION

Personal and professional development (PPD) starts from the moment you enter any educational system. Especially during your years at secondary school, you are prepped to make decisions about your life and choose your next steps after graduation. In higher education, like university, this developmental process continues and becomes more tailored to your study and yourself. At our own department of Industrial Design at the Eindhoven University of Technology, we always have had an integrated learning line of personal and professional development in our education that we called professional identity and vision. The goal of this learning line is to support you in your developmental journey that you will make throughout your study here at the faculty. In this process, you will find yourself surrounded by peers and supported by tutors and coaches, all whom you learn from and use to understand who you are and what it is you want as a designer. However, this support currently stops the moment you are graduating. At that moment in time, you will need to graduate and figure out what is next. But how are you supposed to do that when you might not have the right support? And if you want support, where are you supposed to get it?

PPD at Industrial Design
Our personal and professional development learning line starts the moment you enter our faculty. In the first year of the bachelor's degree, you are introduced to your peers and be given a tutor that helps guide you through the learning process of discovering who you are as a designer. Together with your tutor and tutor group, you will delve into topics such as professional identity and vision whilst tackling how to create good reflections and goals which are needed in order to successfully complete this study. This continues in your second year with more in-depth sessions with your tutor.

In the third, and last year, of the bachelor you will receive tutor guidance alone. This allows you to go even more into depth about who you are as a designer and what you want. But this support of a specialized tutor is only available in the first semester. When you enter your graduation project, the learning line stops and you only have your coach to guide you.

In the masters, the support from a coach continues but that is often the only thing that supports you in PPD. As a (pre-)master student coming from another study or university, there are several specialized sessions designed to help you with professional identity and vision (PIV), reflections, goals and more. But these are merely workshops created to make sure you understand our educational system and how to succeed in it. Meaning it is still up yourself to figure out the rest, which is hard to do for any student.

Project Goals
During this project, the main focus will be on graduating students from the Industrial Design faculty at the TU/e (both bachelors and masters). The goal of the project is to design something that is able to support graduation students in their personal and professional development journey. Even though our department has a good PPD system, the aim of this project is to see what can be created to extend that. This project will not deliver a replacement of any sorts but rather an add-on that can be used to target current challenges that graduation students face when figuring out what is next. By focusing on creating overview and insight to what is available in a fun and playful way, the hope is that the end product is able to inspire students and show them what is out there.

RELATED WORK

Personal and professional development (PPD) has been a hot topic for researchers, both in academic as practical domains (e.g. the workplace) (Davies & Preston, 2002; Edmunds & Richardson, 2009; Ragan, 2018; Zinovyeva et al., 2020). Studies have been focusing on the various facets of a person's growth and skill development in several educational contexts (Gordon, 2003; Arnoldi et al., 2022). Specifically within PPD there is a big emphasis on self-directed and reflective learning (Webster & Andre, 2018). Self-directed learning allows students of any level and age to take charge of their own learning journey by tailoring it to their needs and goals (Hiemstra, 1994). By adding reflective elements to self-directed learning, students are encouraged to be critical towards their own progress and through examining their own experiences they are able to discover valuable insights for future learning (Brookfield, 2009).

PPD has also been known to help prepare individuals for an ever-changing world by teaching them how to plan and adapt accordingly (Rhoton & Bowers, 2001). By focusing on both personal and professional growth, research has shown that PPD is able to go beyond acquiring skills and into discovery of the self (Friedman & Philips, 2004). Educational institutes have recognized the importance of it and programs are being designed and tested to see how to best nurture student's emotional intelligence, self-awareness and interpersonal skills for example (Mittendorf et al., 2008). Other studies extend upon this by exploring the impact of such integrated programs and their outcomes on career development (Te Wierik et al., 2015).

Several other studies have focused within this domain on personal development planning (PDP) which is closely related to learning practices used for PPD (Clegg & Bradley, 2006). Within this more structured approach to development, students are encouraged to set personal and professional goals with the intend to achieve them before the end of their learning experience (Day, 1994). The goal of PDP is to create an effective personal development planning process that incorporates self-reflection and goal setting (Brandtstädter, 2009). It is widely used in several different contexts, from education to career development and the workplace (Beausaert et al., 2011) because of its holistic approach to enable effectivity and its ability to enhance overall well-being (Bullock & Jamieson, 1998; Evans et al., 2002).

Career Guidance
Closely related to PPD, a next step in your developmental journey is often focused on choosing a career path. Career guidance has been designed to support students of all levels and ages in this journey but is often only integrated into secondary education (Crisan et al., 2015). Studies have shown the importance of an integrated career guidance program in different levels of education (Moly, 2007; Holman, 2014; Hiebert et al., 2014) but due to it not being mandatory, it is often left to the educators to design and implement such programs themselves (Athanasou & Van Esbroeck, 2008; Whiston et al., 2019). Research by the OECD (2004) created insight into policy issues that needed to be targeted in order to improve current career guidance in education. Specifically for tertiary or higher education, they mentioned the lack of career guidance that is available to students at that time. Little attention was and is paid to career development in higher education, causing students to be afraid, anxious or uncertain about life after graduation amongst other things (Lairio & Penttinen, 2006; Pisarik et al, 2017). Other studies have commented on the role of lifelong learning and its labor market outcomes, mentioning the positive impact that good career guidance has on the students and their career expectancy (Maguire, 2004; Robertson, 2013; Dodd et al., 2022).

On top of this, career guidance has been evolving in different ways over the years. Periods of times are linked to the type of career guidance that is needed for individuals in order to succeed in society. The current time period we are in puts a big emphasis on connected communities (Dey & Cruzvergara, 2014). Learning together and from others in terms of career guidance has been proven to deliver great results (Lodders & Meijers, 2017). Good career guidance has also been linked to economic benefits for society (Hooley & Dodd, 2015). Therefore creating effective policies and programs in order to support this is of high importance (Donohue & Patton, 1998; Fernandes & Bance, 2015; Plesa et al., 2016).

Next to this, within career guidance transition phases have been marked to be crucial moments in personal and professional developmental journeys (Hansen, 2006; Orellana, 2015). Moments where students transfer to a new study or graduate and start their career have been defined as sink or swim moments where good support is definitely needed (Christie, 2016). Such complex transitions have been researched and explored to see how the use of mentorships or job placement services can help ease the transition but not all of these solutions are able to fully target the challenges faced by individuals going through the transition (Hodkinson et al., 2006; Kalchik & Oertle, 2010; Boerlijst, 2013).

Serious Games
Serious games have emerged from research and innovation projects into enhancing learning experiences in education (Stapleton, 2004; Susi et al., 2007; Laamarti et al., 2014). They are defined as game-based learning tools that incorporate not only educational theories and concepts but also emphasize the role of enjoyment (Stege et al., 2011; Zhonggen, 2019). These types of games are able to offer students more immersive learning environments that has shown to positively influence engagement and participation (Ravyse et al., 2017; Checa & Bustillo, 2020). Simultaneously, serious games are powerful tools to be used for skill acquisition (Baptista et al., 2015) as these games enable students to learn, practice, and apply skills in a safe environment (Wouters et al., 2009). These games have been designed with personalization and adaptability in mind, enabling educators to transfer learning to real-world contexts and concepts (Anastasiadis et al., 2018). Next to this, serious games facilitate a way of collaborative learning that uses social interaction as a foundation for learning (Corrigan et al., 2015). By interacting with peers and sharing experiences in serious games, teamwork is promoted in serious games which allows students to enhance their communication skills and cultivates a sense of community (Wang & Huang, 2021).

Design Process

GETTING STARTED

Personal and professional development (PPD) is key to preparing individuals for an ever-changing society (Rohton & Bowers, 2001). Therefore creating good support systems is crucial (Mittendorf et al., 2008), specifically in tertiary/higher education. With these insights gained from literature research, the initial framing for this project was created and transition phases in higher education was deemed interesting to pursue further.

Creating initial requirements (figure 1) based on personal motivations and several studies (OECD, 2004; Hansen, 2006; Orellana, 2015) led me to making the choice to design within our faculty's education, as there is already an integrated program. By talking to fellow students about their PPD journeys, opportunities were discovered that led to focusing on graduation. To gain more insight into current perspectives and challenges faced by students about graduation, an online survey was created.

figure 1 - Initial Requirements

Survey
The survey's aim is to understand how students are thinking about graduation. Questions about current plans for after graduation and what influenced this decision were asked. Additional questions were asked about support in this process and if they knew about the available options or used them in the past. 26 students participated (figure 2) in a 9 question survey (~7 min to complete) and their data did create insight into current perspectives on life after graduation (figure 3) but also shed light on the fact that many (22 out of 26) do not know about available support. The results of the survey (appendix B) were used to scope, changing the direction of the project to 'creating insight and an overview into available support (systems)'.
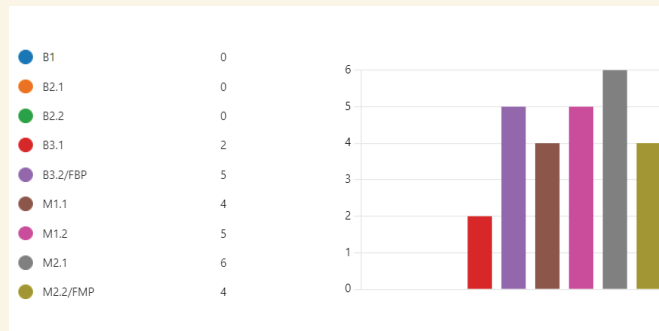
figure 2 - Participant Overview

figure 3 - Plans for Life after Graduation

Competitor Analysis
To get a better understanding of the market- and design landscape of PPD and career guidance, a competitor analysis was executed (figure 4) (Czepiel, 2020). Doing this created insight in what is available to students and what to use as inspiration. Next to this, an analysis of support systems was also done to extend on this by taking a look inward, towards the options within the faculty and TU/e (figure 5).
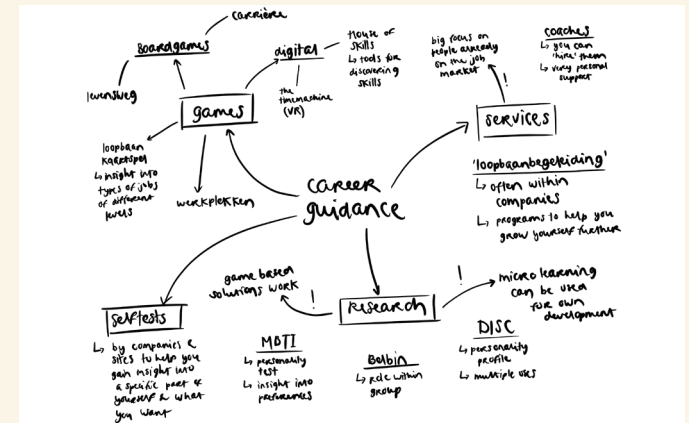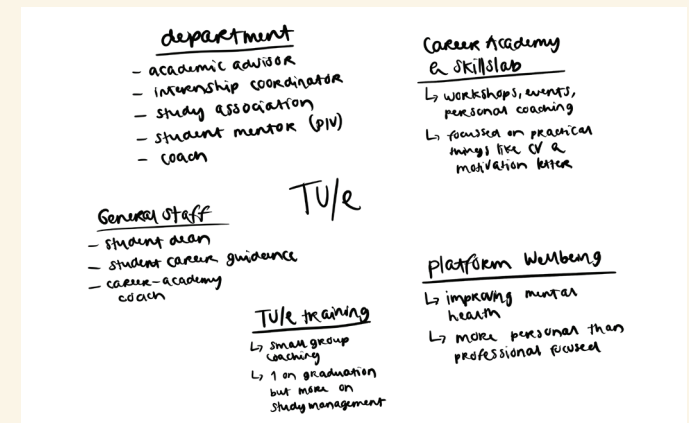
figure 4 - Competitor Analysis

figure 5 - Options within TU/e and Department

Pressure Cooker
To turn this research into actionable ideas, a pressure cooker was done. Crazy Eight's, a brainstorming exercise, was used to kick-start this activity (figure 6). From there, two directions emerged whilst analysing the ideas; creating a game or a toolkit (figures 7 & 8). Due to the creation of toolkits in the past, it was decided to focus on creating a game as I had never designed a real game before. But would also be a great way to create insight into available support in an enjoyable way.
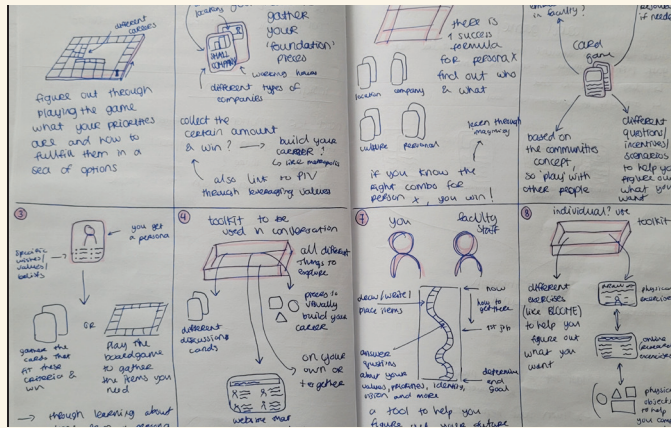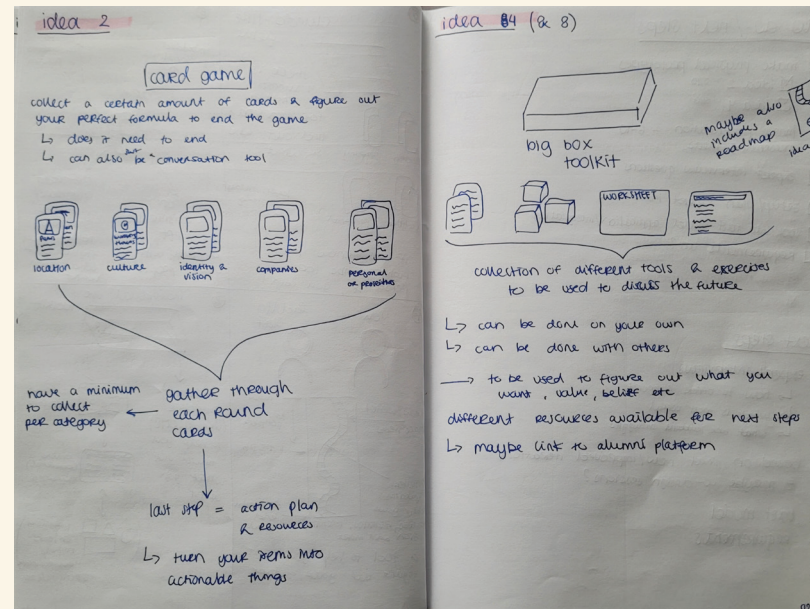

figure 6 - Crazy Eight's Exercise

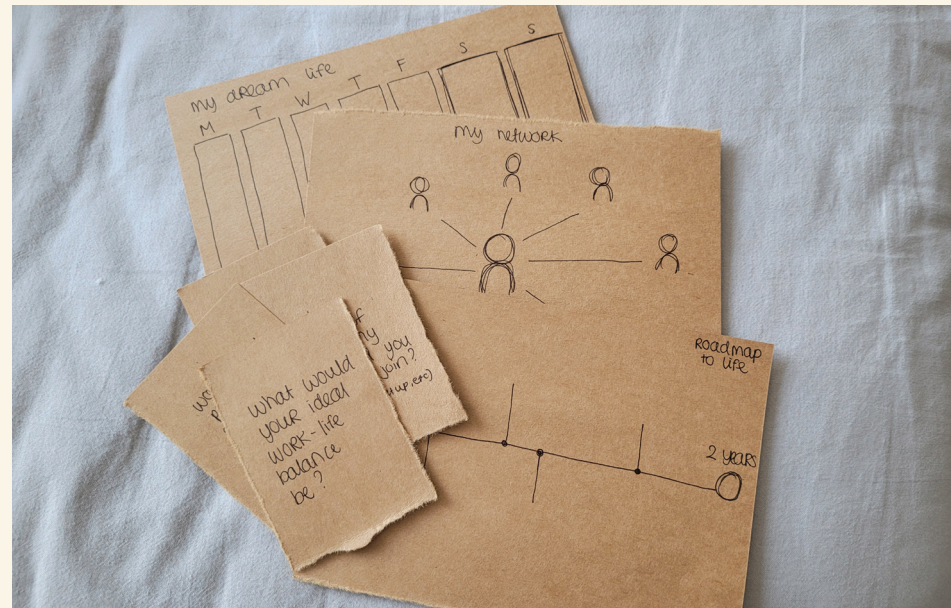figure 7 - Pressure Cooker Ideas Worked out

figure 8 - Paper Prototypes from Pressure Cooker

EXPLORATIVE RESEARCH

To build upon the results of the pressure cooker and validate some initial assumptions, several expert interviews were conducted.

Expert Interviews
4 graduate students and 4 faculty staff members were interviewed to learn about a) current challenges of graduation and b) what support is already available at TU/e.

Data from the students (figure 9)(appendix B) showed the lack of support they are feeling with some even mentioning they do not know where to start to figure out what is next. This further confirmed the data from the survey and extends it by giving specific examples.

Data from the faculty staff (figure 10)(appendix B) helped further understand the current systems and programs in place at ID whilst elaborating on the underlying aim of it. They also self-identified current opportunities for extending PPD for graduation students and confirmed they also think more attention needs to be paid to making resources more explicit.

figure 9 – Data Analysis from Students

figure 10 – Data Analysis from Faculty Staff

Game Design Research
Designing a game is something I had never done before, therefore I decided to focus on researching game design, specifically the MDA framework (Hunicke et al., 2004). The MDA framework/model (figure 11) shows how games are approached as a designer and player. I used the model to guide the creation of my own game. By identifying and writing down what the game would need to be, I started the game design explorations.

I started with a mechanics exploration, finding the ones most suitable for my project and ideating upon them (figure 12). In this way, I was able to brainstorm on several different possibilities and create out-of-the-box ideas for integrating them. Extending that with a dynamics exploration, I looked into what dynamics are and how to design them. The Octalysis (Chou, 2019) (figure 13) model helped identify core drives that would be implemented in the game. The aesthetic exploration was left for later as the mechanics and dynamics need to be addressed first, according to the MDA Framework (Hunicke et al., 2004).
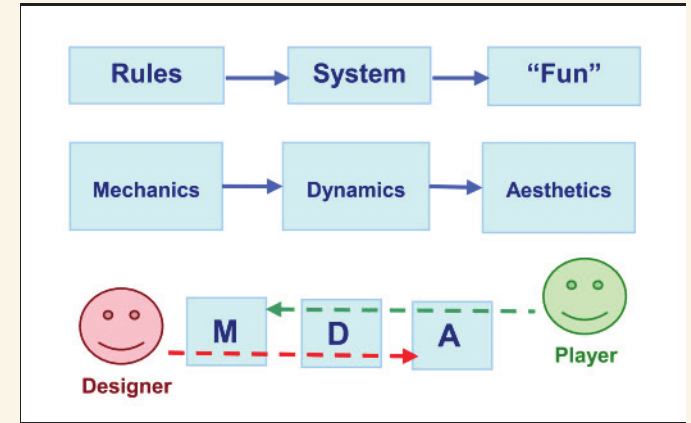
figure 11 – MDA Model (Hunicke et al., 2004)
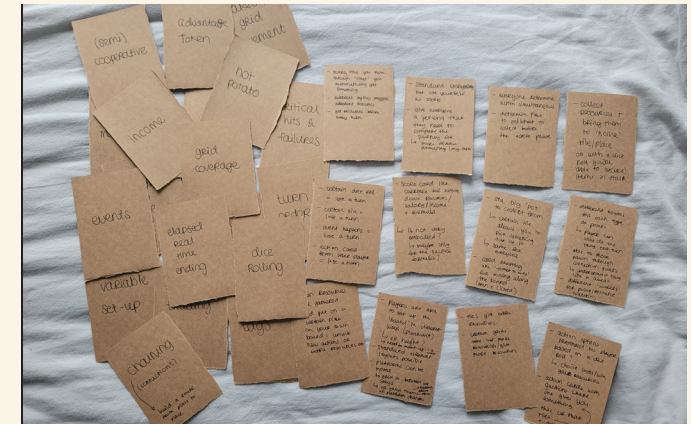
figure 12 – Game Mechanic Exploration
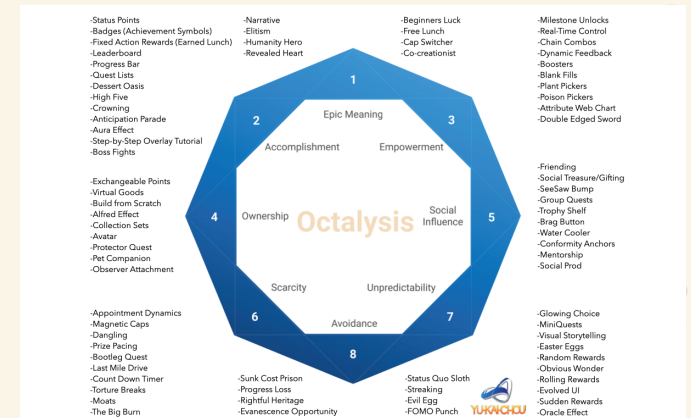
figure 13 – Octalysis Model

First Version of the Game
Using all insights from the interviews, research and explorations a first version of the game was created (figure 14). The game at this point was very basic and showed how the integration of the aforementioned mechanics and dynamics could look like (e.g. variable set-up, events). The platforms are interchangeable and players need to visit each to gather resources. Along the way are events that can make or break their strategy.

events
based on mechanic exploration and integrated due to its ability to represent 'life happenings'

platforms
designed from mechanic: variable set-up
↳ also represents available support (embodiment)
↳ different heights & widths to represent difficulty of accessing such support

grid
standard form to be used as you travel from platform to platform

dice
based on mechanic of dice rolling and its option to simulate real-life (un)lucky happenings

figure 14 – First Version of the Game

THE GAME - ITERATION 2

Because the first version of the game was basic, several new explorations were done. These explorations varied from ideating specific mechanics to creating prototypes to test them out (shown in figures 15-18)(appendix D) and were done using previous research.

My goal for these explorations was to see what was beyond my initial ideas. I felt the first version of the game would be too basic to cont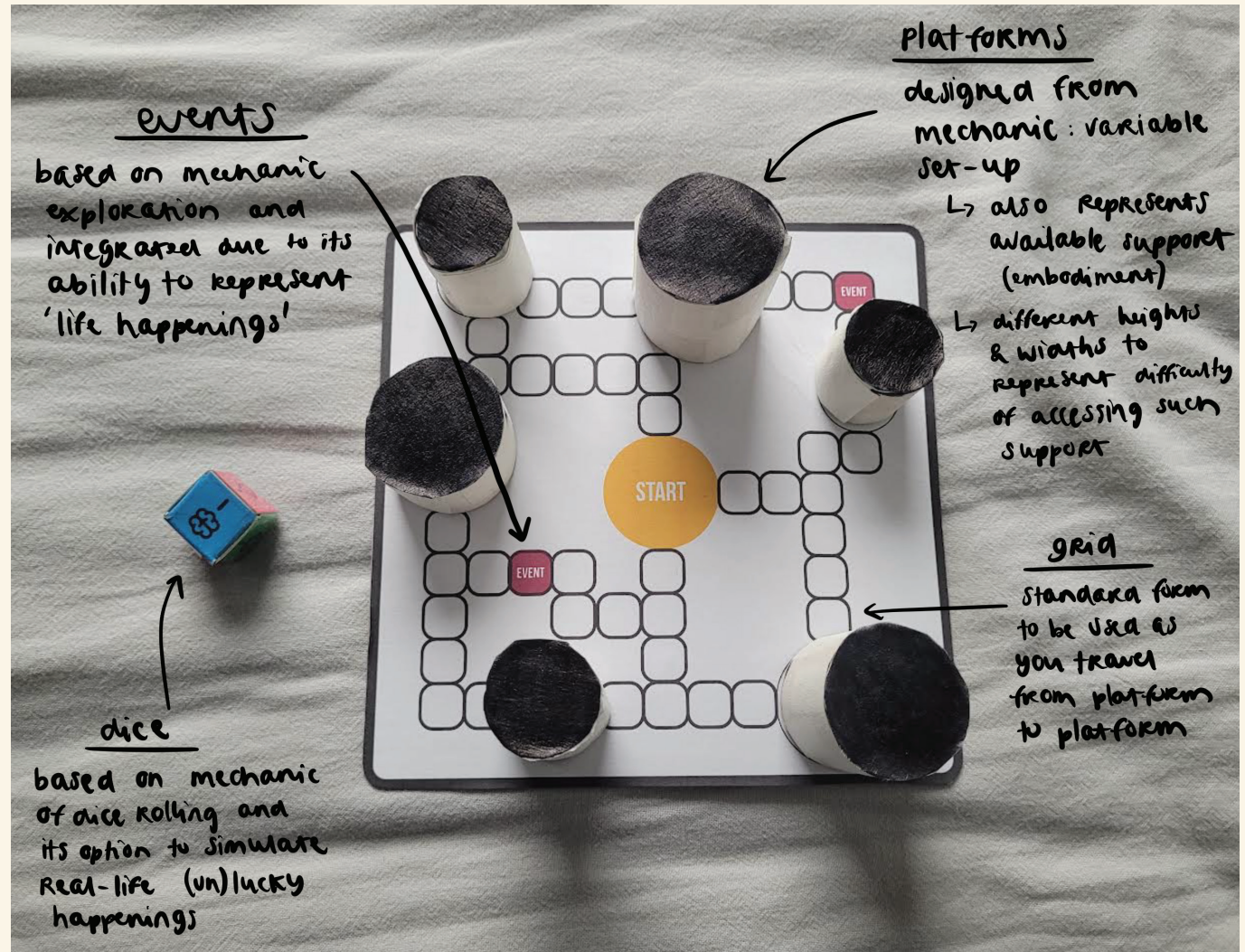inue and even though it did incorporate some of the desired mechanics and dynamics, it did not all fit greatly together. By doing more in-depth ideation, I felt I created a stronger foundation for the game that I could keep building on. After doing these explorations, I felt more confident in my ideas as I was able to ground them in user and game research.

Towards the end of these explorations, I took a moment to reflect on the game (core). I had created new solo-standing ideas for mechanics and dynamics. Having these seperate elements marked the end of the second iteration, as I now had a foundation of mechanics and dynamics which needed to be turned into one coherent game rather than seperate elements.
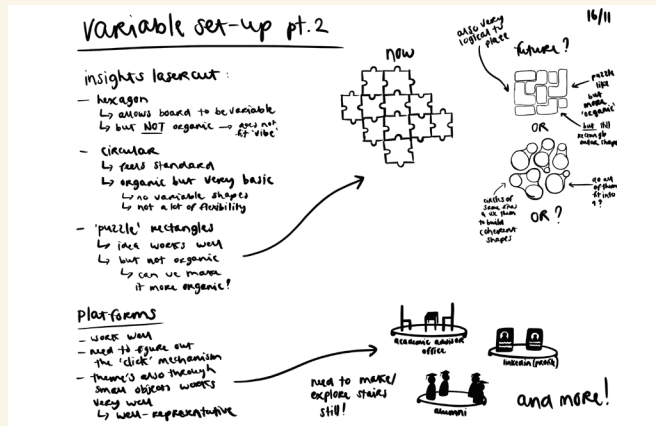

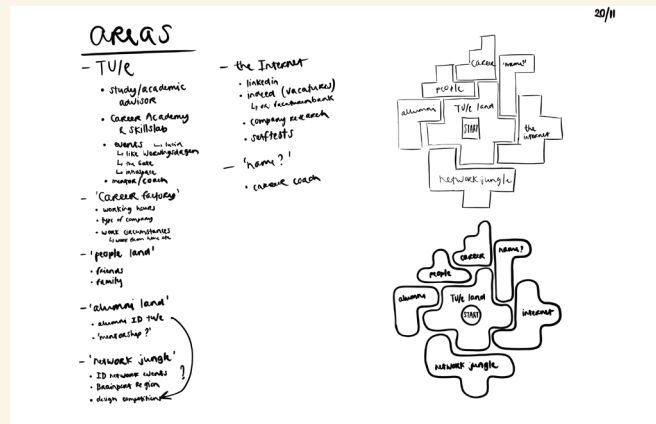figure 15 - Variable Set-Up Exploration

figure 16 - Areas and Platform Ideation

figure 17 - Variable Set-Up Prototype 1

figure 18 - Variable Set-Up Prototype 2

THE GAME - ITERATION 3

Creating a coherent game was the main focus of this iteration. Therefore, I finalized my ideas for each of the elements I wanted to include using my previous user and literature research.

I used the design of the game board as the start of this 'combination phase'. From here I explored the layout of the board and the platforms it would have (figure 19). Platforms are embodiments/representations of the available resources and support for graduate students (figure 20)(e.g. activities, information or people they can use to help make a decision). By making journeys by going from platform to platform, players would see how to go about figuring out what is next. The platforms are based on previous explorations.

From there, collectable resources were defined. These resources are based on the influences students mentioned in the survey; financial, emotional and intellectual. Players would be asked to prioritize these three and start collecting fitting activities to complete the game.
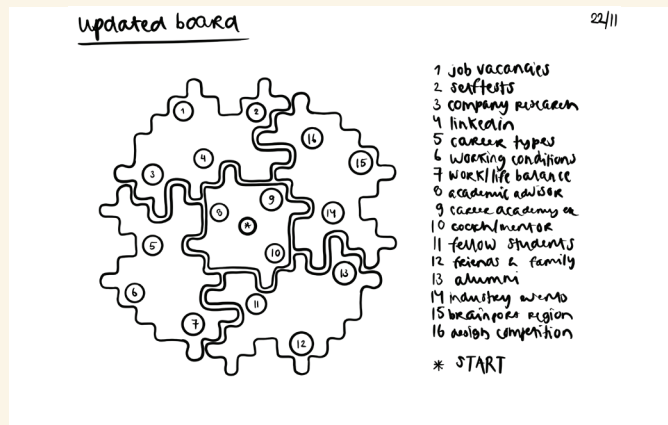
figure 19 – Layout of the Board
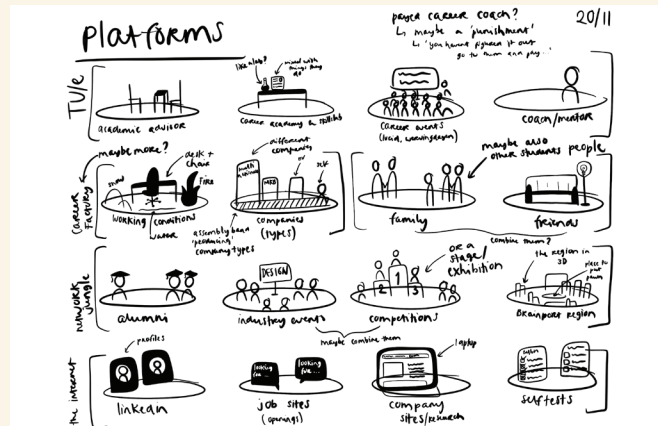
figure 20 – Platforms
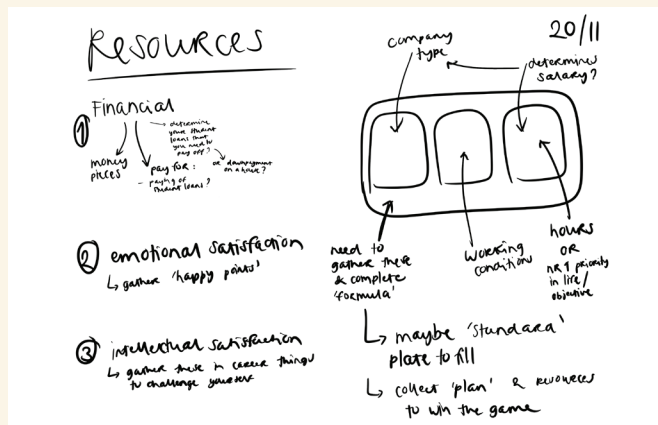
figure 21 – Resources

figure 22 – First Logo of Expedition Career
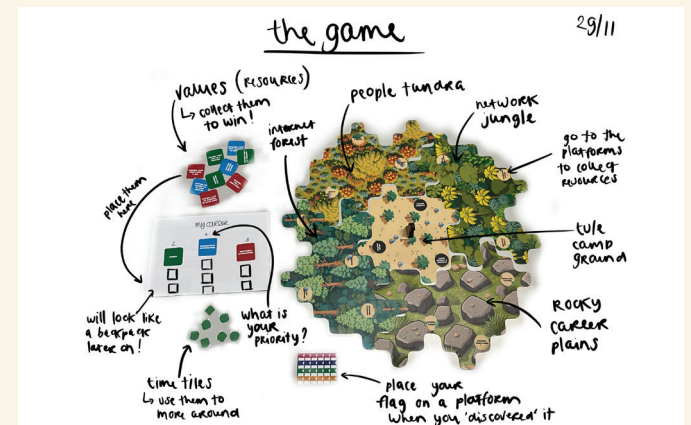
figure 23 – First Version of Expedition Career

Aesthetic
Because of the game taking shape, an aesthetic exploration was done. A standard branding process was executed to create a graphic style (figure 22). The theme of explorers was deemed suitable as it linked to the 'life is a journey' metaphor present in the game. These graphics were used to create

Playtesting with Designers

The opportunity arised for doing a playtesting session with fellow designers with the goal to get feedback and improve my design as I was unsure about the integration of several elements and how enjoyable the game be. The first play-able version of the game was used for this explorative session for two groups of four students (total 8 designers) who would play it.

The results from the session showed what I was already expecting; it was too complex. There were many elements that I wanted to incorporate that the core of the game was lost to players, making them focused on winning rather than learning. Lots of feedback was given (figure 25) and a suggestion was made to go back to its core and use a good example game to start building up the rest of the game around it.

figure 25 – Feedback Designer Review

Reflection Moment

After the session I took a moment of reflection and looked again at the core. I critically reflected on the MDA explorations I had done and simplified it into six key components of the game (figure 26). Incorporating too many MDA components before led to a complex and unimpactful game, which is why I stripped it back and started a new iteration.

figure 24 – Playtesting Session with Designers
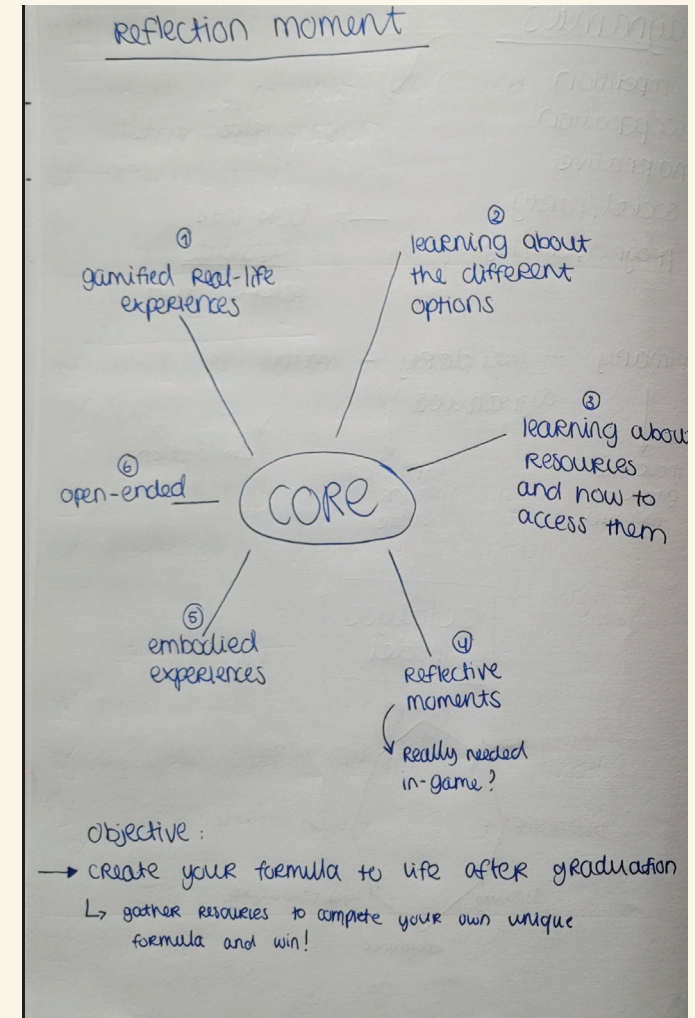
figure 26 – Core Definition

THE GAME - ITERATION 4

The final version of the game, also presented on Demoday, was created by stripping the game to its core and building it up again. Inspired by the game Ticket to Ride that also uses a journey in its game, I used some basic game mechanics and dynamics and started building a new version of the game (figure ...).
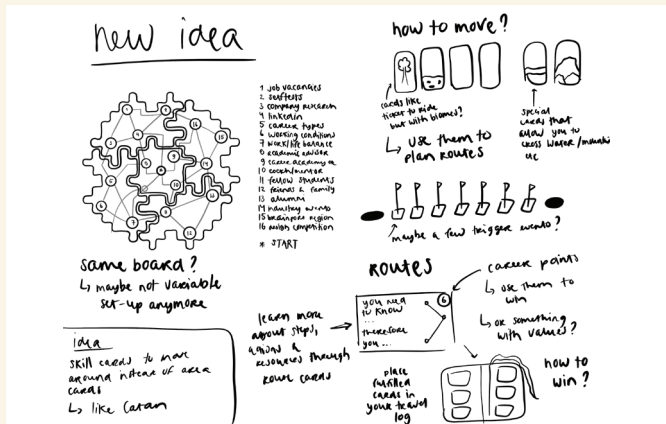
figure 27 – New Version of the Game

A new map was created (figure 28 & 29) that would still incorporate the platforms but rather as 'travel destinations', similarly to Ticket to Ride. This would ensure the game would be less complex and more enjoyable to play. Using a similar game structure for making your journey, players would collect cards to move across the board.

To make sure the game would still give insight into available resources and support, route cards were designed based on real-life challenges or questions graduate students would come across (figure 30). Players would need to finish routes to complete the game.

figure 28 – New Map (Parchment Version)

figure 29 – New Map (Biomes Version)

The theme of explorers was kept but redesigned to be more suitable. A new branding was developed and the physical creation of the game started (figure 31). The full game is the same as the final design, therefore more details are provided in that chapter.
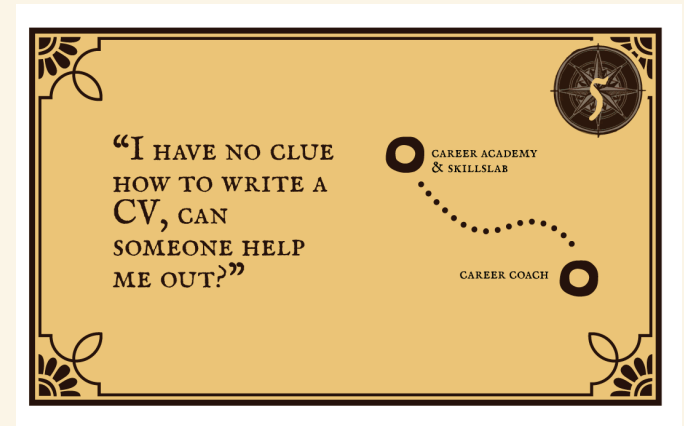
figure 30 – Route Card Example

figure 31 – New Logo

EVALUATING THE GAME

To evaluate the final design of Expedition Career, a two-folded plan was created; playtesting sessions and an expert review.

Playtesting
The goal of playtesting is to determine gameplay experiences and testing the impact/influence it has on figuring out what is next. Using this as the foundation, research was done to find the most appropriate and effective methods for achieving this.

I planned two sessions, each with four graduation students following the same set-up (figure 32). The Game Experience Questionnaire (IJsselsteijn, et al., 2013) was deemed suitable for this purpose and along with a series of self-developed questions and the Tast Model Evaluation tool (appendix B), I hoped to get the results I expected without players influencing each other.

Unfortunately due to sickness, I was unable to execute it. I could not re-do due to students having their own important deadlines. However, I still want to have these insights and will plan new playtesting sessions at the beginning of the semester.

Expert Review
I was able to execute one expert review session with a faculty member, using a semi-structured interview format. The goal of this session was to understand their perspective in relation to Expedition Career and assess the potential of a) using it, b) using it in our PPD learning line and c) opportunities for continuing this work next semester. I asked them about their perspective on the game and from there we discussed its impact and its potential for implementation. The results of this session are used in the next chapters of this report and appendix B.

STEP 1	STEP 2	STEP 3	STEP 4
SHORT INTRODUCTION TO SESSION	FILL IN CONSENT FORM AND INITIAL SURVEY	PLAY THE GAME	FILL IN POST-GAME SURVEYS
2 min	8 min	40 min	15 min
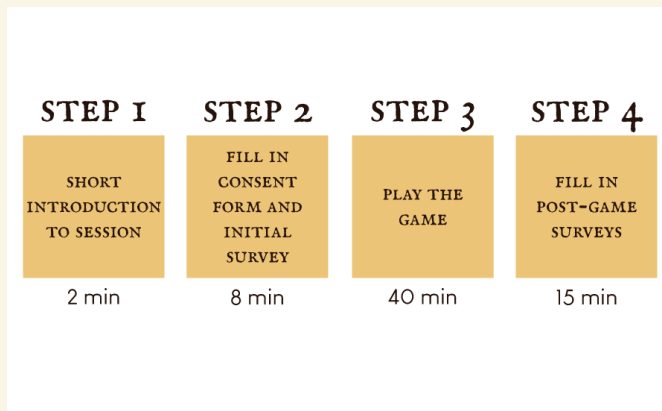
figure 32 – Playtesting Set-Up

Final Design

Expedition Career is a serious game designed to support ID graduation students with figuring out what is next. Its aim is to give insight into the available resources and activities as well as people they could talk to. By showing them current challenges/questions that they might face in this process and how you could go about 'solving' them, they get inspired.

The game is designed for four players. By collaborating with the department, students can be offered to play the game with peers in order to help them with their PPD. My aim is not to force them to play, rather offer the opportunity and explain the benefits. User research showed that graduate students are indeed looking for more support, so the ones that want it will do it.

Rules & Objectives
As the story goes, players are dropped in the middle of Career Island. As a crew of explorers, players are tasked with making sense of the landscapes and finding their way through them. Players are independently creating paths and establishing routes throughout the game and the player who establishes the most 'worthy' routes is crowned the expedition leader and 'wins' the game. Because of the many metaphors integrated in the game, the main focus should not be winning but learning, because winning in life is not possible. Therefore the storytelling used in the game aims to make sure this comes across.

Players collect cards from different landscapes in order to move from one place to another and establish their routes. After 'paying' for your route, players can place down their flags to indicate their path. The goal is to create as many paths needed to complete route cards, which are given at the start. The rules can be seen in figure 34 or appendix E.

figure 33 – Expedition Career

figure 34 – Game Rules

figure 36 – Destinations in TU/e Camp Ground

figure 38 – Path Markings

Gameboard

The board represents Career Island which the players need to explore (figure 35). Several destinations are featured on the board that represent the available resources, activities and people (figure 36) graduate students can use. There are five biomes (figure 37), each designed as a cluster of destinations that adds to the overall storytelling of exploring. Players start from the TU/e Camp Ground and can then branch out to the Internet Forest, Networking Jungle, People Tundra or Rocky Career Plains.

figure 37 – Biomes on Parchment Versioin

Routes

At the start, each player receives six route cards which they can then place on their decorative expedition logs (figure 39). Each route card shows a challenge/question graduate students might face when figuring out what is next. Next to this, a route is shown including two or more destinations the player needs to visit in order to receive the amount of points shown in the top right corner. At the end, players can look at the destination guide (figure 40) to see what each destination means and how to use them.

figure 35 – Game Board

Between each destination there are paths, marked by the little colored circles and square holes (figure 38). These show the players how to move from one place to the other and how to 'pay' for that route. The colored circles show them which area cards they need to collect in order to build their path. When you have created a path, you can place down your flags in the holes. There are four holes, one for each player, as each player can make the same path.

figure 39 – Expedition Logs filled with Route Cards

figure 40 – Destination Guide

Area Cards

There are five different biomes and therefore five different area cards (figure 41). These need to be collected in order to move from one destination to another. Players need to collect the same number of cards as the length of the path (figure 42), indicated by the amount of colored circles. There are also two special cards (figure 43) which are needed if you need to cross a river (blue dot) or a mountain (black dot). These special cards are rare and not so easy to collect, so good strategy is needed.

figure 41 – Area Cards

figure 42 – Path Payment Example

figure 43 – Special Cards

Players receive four random area cards at the beginning. Each turn, the player has several available actions (figure 44). When they want to draw cards, they can do that from the five open ones or draw from the closed deck (figure 45). If players have enough area cards collected, they can build their routes by 'paying' with their cards (figure 46) and putting them on the discard pile.

The graphics on the front of the cards were created with the Adobe Illustrator AI text to vector tool. Their reference, including prompts and inspiration used, are included in Appendix D.

LET'S PLAY!

A TURN

Decide which player is allowed to start. After this is decided each player will take turns in a clock-wise order. During your turn, a player can execute one of the following actions (and only one):

1. *Collect area cards*
    The player can take 2 area cards (or only one in case of a river/mountain card; see special cards). You can either choose to draw from the open cards or draw from the stack, players are also allowed to first draw one card from the open cards and then one from the stack or vice versa.

2. *Build a path*
    A player can build a path on the board if they have the same amount of cards as the amount of spaces on the board it takes to get there. After you have paid the right amount of cards, you can place down your flags to mark your path. Your first path needs to be created from the start location in the middle of the board, after that you can branch out and explore.

COLLECT AREA CARDS

There are five different areas on the map which correspond to five area cards. Each area card will have colored border which color corresponds to the circles marking the path on the board. The circles might not be fully centered with the four holes but will be close by and easy to spot. These circles indicate with which card you need to pay for your route. You can then start collecting them by drawing from the open cards and/or deck.

figure 44 – Options per Turn

figure 45 – Drafting

figure 46 – Paying for your Route

Business Considerations

In order to analyze and assess the business potential of Expedition Career, an extensive business analysis was executed (appendix C). Specifically the USP (figure 47) and SWOT (figure 48) gave a lot of insight into the business potential of the game. The USP's helped define and understand the strengths of the current game which where then used for the SWOT. Furthermore, the SWOT helped see what weaknesses and threats are. These will provide a great starting point for next semester where these can be solved and tackle to make the market potential of the game even better. In the end, these analysis's and mappings helped to evaluate the game and see what is still needed to make it better.

Evaluating the Game

The business analysis in combination with the literature and user research shows great potential for Expedition Career. The game is able to give graduate students insight into available resources, activities and people but also provide a whole bunch of other benefits. Even though the playtesting did go through as planned, previous user research confirms the need for creating an information overview of what support students can use. On top of that, providing support in an embodied, social and engaging way will yield better outcomes for the players. The expert review with a faculty staff member also helped understand their perspective on support tools for PPD and graduation. It showed this game fits well within current education on PPD and would provide the department with a new and innovative way of offering support that enables students to build community and get the support they need. Figure 49 shows an overview of claims the game makes and why the game will work for what it was designed.

A NEW FORM OF SUPPORT (GAME)	ID SPECIFIC RESOURCES	EMBODIED LEARNING
LEARNING WITH AND FROM OTHERS	GIVING INSIGHT INTO RESOURCES	CREATING COMMUNITY
PLAYFUL LEARNING	SPARKING INSPIRATION	REAL LIFE REPRESENTATION

figure 47 – Unique Selling Points

	HELPFUL	HARMFUL
INTERNAL	**STRENGTHS** new form of support ID specific resources engaging & social real world representative	**WEAKNESSES** how to get students to play the game practical: how big will the box be, how to bring it to the students
EXTERNAL	**OPPORTUNITIES** expanding the world through adding more features working closely with the department to ensure it suits current education and could easily be integrated	**THREATS** digital games that are easily played department creating a new form of PPD support for graduate students

figure 48 – SWOT

THE GAME SHOWS AVAILABLE SUPPORT
the online survey showed 84,6% of the students who participated they do not know about available support

the interviews confirmed that students would like to have an overview of who to talk to, where to get support and information

THE GAME IS ID SPECIFIC
the online survey showed that people would like to receive more ID education specific resources instead of generic or general things

"more ID specific help, its really hard finding the opportunities there"

the interviews also confirmed they want to talk more about ID specific things as their friends from other studies have a very different perspective

THE GAME SUPPORTS PPD/CAREER GUIDANCE
literature research showed the importance of working on creating more support for higher/tertiary education (OECD, 2004), the game does that

THE GAME ALLOWS STUDENT TO LEARN WITH AND FROM EACH OTHER
interviews with students showed that they currently are already talking with people, which helps them figure things out -> shows a need for learning from each other

students also mentioned they might need advice and perspectives from others, which they can get from other players whilst playing the game

faculty members have confirmed (interviews & expert review) they believe good support can be found amongst peers and through creating communities with them, which the game allows for

THE GAME ENCORPORATES PLAYFUL AND EMBODIED LEARNING
literature research has confirmed serious games are a good way of facilitating a new way of learning that can be more engaging and valuable to students (Ravyse et al, 2017; Checa & Bustillo, 2020)

the expert review confirmed that the game would have a good impact on students because of these aspects and the real-world aspects will really help them with their PPD

figure 49 – Why The Game Will Work

CONCLUSION

The aim of this project was to design something that would be able to give graduation students at Industrial Design insight into the available resources and activities as well as people they could talk to. Taking a user-centered approach to designing such a tool, different data was gathered that supported the development of a serious game called Expedition Career. A visualization of the full design/research process can be seen in figure 49 and appendix A. The process of making the game can be seen in appendix D (including all prototypes).

The final design consists of a full-fledged board game that is ready to be played by graduation students. Several playtesting sessions need to be held in order to further improve the gameplay and assess the impact/influence of the game on graduation students figuring out what is next. Overall, the game offers a playful and embodied representative of real-world resources. User research supports the underlaying aim of the game but several areas can be explored further in order to address things like reflection, conversations and more. In the end, there is great potential for Expedition Career.

figure 50 - Design Research Process Visualization

DISCUSSION

The aim of the project was to create a support 'system' for graduate students. It resulted in the design of a serious game called Expedition Career that gives students insight into available resources, activities and people for figuring out what is next.

Limitations
There were several limitations faced during this project. The first one being the use of metaphors in the project. As the aim of the project was to support students in their personal and professional development journey, it became clear that we were talking about life. Creating something based on life is difficult because it means something different for everyone. Making a game based on life and its journey, or parts thereof, became quite hard. Balancing these metaphors of life made several explorations very difficult due to not wanting to give the wrong impression or assumptions to players. Not knowing what was the right option or avenue to pursue made it harder for me to make decisions. In the end, this maybe held me back in my process and maybe I could have achieved a bit more. Even though I am unsure of how to solve such a limitation, getting multiple perspectives on the questions I was facing helped. In the future, I would definitely be reaching out to others who can support me and give me the perspectives I am looking for. I believe that balancing these metaphors of life is crucial to creating good impact with your design, therefore I aim to use it as an opportunity and not as a limitation from now on.

Another limitation I faced was during my user research. Sadly I became very ill, making me unable to execute the planned playtesting sessions. These sessions would have helped me gain insight into the current gameplay of Expedition Career and see what the impact/influence would be on current graduate students. Because I was unable to do these sessions, I feel less confident about the claim the game currently makes; which is giving information about available resources in an embodied and enjoyable way. Even though the user research I have done can comment and argue for some of the game's aspects, I feel more user data would have made the argument and claim stronger. The playtesting sessions will be planned at the beginning of the semester to make sure the data is still gathered, although later than planned and expected. This will then help improve the game and explore what is beyond.

Future Work
There are several opportunities for developing this project and game further in the future. Creating a fully thought-out support system for graduation students at ID was not very feasible during the timeframe of this project. Therefore several scoping sessions and reflection moments were held in order to assess the current direction. At those times, other ideas were put to the side for later.

One of these ideas was reflection. As the goal of the game is to give students insight into available resources, activities and people, there was a hope that providing this information would inspire and encourage students to take action. However, there is no current 'aftercare' in place after students finished the game. Future explorations could focus on creating moments of reflections before, during and after the game. This could help students see the impact of the game but also help relativize the information they learned.

Similarly, the element of discussion or conversation seemed to be interesting to pursue further within this project. Research showed that we as a society are moving towards connected communities when talking about career guidance (Dey & Cruzvergara, 2014), therefore implementing more social aspects in and around the game could prove to be beneficial. Future work could focus on the social aspect of the game, seeing what opportunities lie for implementing this in the game itself more but also around it. Are there more design opportunities for creating tools that fully target the social aspect of supporting graduation students?

Building upon this, reflection and discussion/conversation came as natural ideas sparked during this project, but there are definitely more out there. One way of finding such ideas is to do case studies with the current game. This will not only help further improve the gameplay and impact but could also be used to see what students think can be done to extend upon it. It could be a great starting point for future work to see what is important to students and what needs to be further addressed in a new round of ideation.
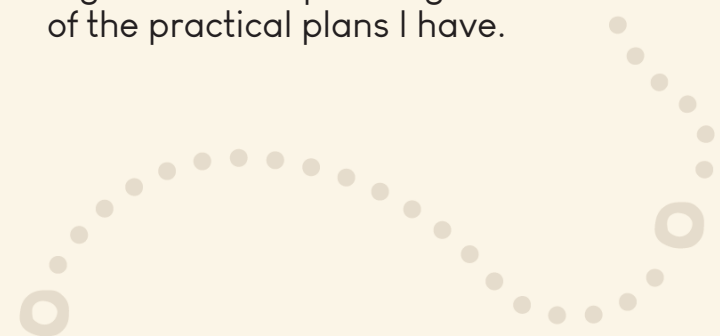
FMP Proposal

INTRODUCTION

Good support for personal and professional development (PPD) is something that I believe every student should has access to. But (good) career guidance, which is a part of the PPD process, support and services have been lacking, most often in higher/tertiary education which impacts students immensely (OECD, 2004; Rhoton & Bowers, 2001; Te Wierik et al. 2015; Holman, 2014). Figuring out what you want in life can be a quite difficult thing, especially when you have to finish up your studies simultaneously. My goal for my M2.1 design project therefore was to design a game that would help graduate students get insight into available resources, activities and people. Taking that first step and allowing students to explore what is currently out there and what they could use to figure out what is next is crucial.

Whilst developing Expedition Career, more and more opportunities for further explorations and new iterations arose. Due to the timeframe, the project needed to be very well-scoped and therefore all these ideas and opportunities were stored safely on the side. Right now, they are ready to be picked up again and turned into a plan for next semester. I felt and feel there is more to create, design and develop beyond my current game. Focusing not on just improving the game but rather extending the world of Expedition Career is my aim for my graduation project. My goal is to design more support tools, ones that might have different features and aims but all designed with graduate students in mind and their need for support to figure out what is next.

This report before you contains the plans for the upcoming semester, plans for my own graduation project. I will discuss my first iteration (M2.1 project) and how that shaped my graduation project. Within this section, I highlight the similarities and differences that my projects will have and explain what this new project will entail. By elaborating on my own vision and identity, I hope to share my view in relation to the project I have decided to pursue. Because my graduation project will share the same context as my M2.1 project, the related work section (page NOG INVULLEN) will relate to both projects. The final section includes a summary of the design brief I aim to use for my graduation project together with a planning to show more of the practical plans I have.

WHAT IS NEXT?

Expedition Career was designed to target the lack of knowledge about available resources, activities and people in graduation students. The creation of this game was the first step in the development of career guidance support tools for graduate students at ID. But during the development of the game, several great and interesting opportunities arose for future explorations. These opportunities form the basis for my graduation project where I am able to explore what is beyond Expedition Career.

Differences & Similarities
To ensure my graduation project will not just be improving Expedition Career; the game, it is important to highlight the differences and similarities between both projects. Figure 1 is a great example of my perspective on both projects. My M2.1 project provides a starting point in this exploration of support tools for graduate students. My FMP will use this as a foundation and reference point; enabling exploration beyond the current bounds of the game. Because there were so many ideas and opportunities where the game could be this or could target that, new stand-alone iterations will be done to explore these possibilities. On top of this, doing playtesting sessions that were not possible during my M2.1, will lead to being able to improve the game as well as give inspiration and insight into new directions.

The goal of my FMP is to create a world around Expedition Career where there can be multiple games and tools all with the aim to support graduation students. Improving the game will therefore only be a short activity. The similarities of the projects will be in the context and domain, not the outcomes. Using previous literature and user research will allow me to hit the ground running and really build on what I have already created. This also enables me to go more in-depth and use my time to learn and practice new skills, techniques and approaches.
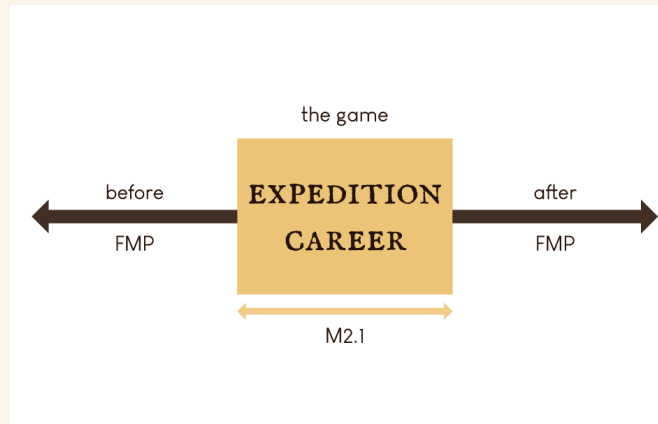

figure 1 – Vision on FMP

Ideas
The challenge of this project is to expand the world of Expedition Career by developing more tools/games, or "artifacts", that target the needs of graduate students and other stakeholders at ID. To address this challenge, the following research question was formulated: "How can an "artifact" be designed to effectively support Industrial Design graduate students in their personal and professional development journey to help them figure out what is next?". Even though there is no clear view yet of what these artifacts will look like, there are several features that could provide the support that graduate students need.

1.   Discussion & Conversation
The social aspect of career guidance and personal and professional development in general has been mentioned quite a few times during the development of Expedition Career. Questions were raised about the integration of social interactions and their impact on the support solution. Because Expedition Career is a game, there is inherently a social aspect to it because of the fact that you need to play it with four players. But beyond that, there was no specific reason of integrating a social aspect.

A new iteration focused on the social aspect of support solutions for graduate students can be undertaken. Previous user research has shown that many students talk to each other which helps them think about steering their own development and projects. This presents the opportunity for creating something that could steer these conversations/discussions towards career guidance. On top of this, an exploration can also be done to see whether involving the faculty, or members thereof, in this conversation would be insightful and impactful.

2.   Communities
Research studies have commented on the community aspect of personal and professional development, mentioning the shift towards people in career guidance services (source). The interviews showed potential for exploring this but because of scoping, this was not pursued further. By creating something new that would target communities and their involvement in PPD and career guidance would explore this research opportunity and assess its feasibility and impact in the form of an artifact. The development of such a tool can also aid the exploration of 'socialness'.

3.   Reflection
The game is able to give insight into information that can be used to make a decision about what is next. Even though the hope is that students will reflect on their own journey and maybe even take inspiration from the information integrated in the game, that is not the claim the game makes. Reflection can be used as a powerful tool to steer personal and professional development as mentioned before but right now the integration of this approach is non-existent. There can be several reflection artifacts developed that would allow students to relativize the information of the game or something else about their PPD journey in relation to career guidance. Steering reflection can be difficult when you do not know where to start or what to reflect on, so helping students by guiding them could prove insightful.

RISK MANAGEMENT

Before taking on this project, it is highly important to identify and assess potential risks that may arise. Here are three potential risks that were identified and how they can be addressed.
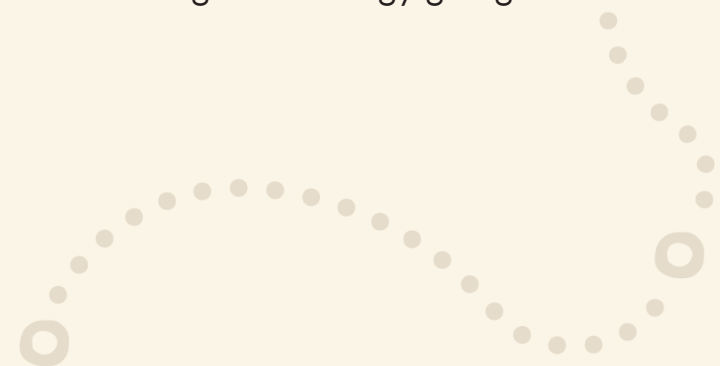
1.   Stand-alone Project

Extending your M2.1 project into your FMP can provide great difficulties, especially whilst making sure that you are doing a new project and not just 'improving' the old one. To mitigate this risk, I have dedicated some time to explore the differences and similarities of both projects which is presented in the previous chapter. I also will be setting some boundaries for the new project to make sure it will not fall back into my M2.1. These boundaries will be constantly reviewed and used as a tool during my new design process to ensure my graduation project will be a stand-alone project.

2.   Stakeholder Engagement

As a user-centered designer, I like to include by lots of user research activities in my project planning and using the data to make my design decisions. Unfortunately due to unforeseen circumstances, I was not able to achieve all of my planned activities for my M2.1. To mitigate this risk of having enough stakeholder engagement in my process, I aim to create and maintain a realistic planning of my process. My goal is to revise and adapt my planning (bi-) weekly, making sure I keep track of short-term and long-term goals for each facet of my project with one being stakeholder engagement.

3.   Only ID

Focusing on only the ID program at the TU/e can limit the options for bringing the world of Expedition Career to market. Therefore it is important to assess at several times the impact of the project on the business potential. By incorporating a few reflection moments in the business activities, we can assess and reassess the direction of the project to see whether to include a wider target audience and thus market. Experts will be consulted during the project to help devise a good strategy going forward.

PROJECT FIT

My Identity

To explore is to discover, at least that is how I aim to make sense of this world of endless possibilities. A world that is changing everyday can be hard to navigate, which is why I like to keep moving in both the literal and figurative sense. I see myself as an 'explorative thinker' who is always contemplating the next move in my life and my work. I find that exploration allows for the creation of new ideas, directions and more, it opens up the realm of opportunity without compromising on imagination. Broadening your own perspective creates growth and newfound depths of creativity which I use to improve user experiences, fill market gaps or find solutions to other arising problems.

I identify as an user-centred educational designer, taking the user as a focal point in my work whilst specializing in an area that aims to enable others to learn and grow. My goal is to support and guide people in their developmental journeys using design. Without a good understanding of the user and its environment, it is difficult to create this value in my work. Therefore I aim to always create a foundation of information first, opening up a conversation with people who experience a certain struggle and establishing a market-, design- and research landscape to back up initial findings. Taking a user-centric approach in in a highly iterative data-enabled design process allows me to make decisions based on real user insights, thus creating more well-suited solutions and better overall experiences in my work. My passion for graphic design allows me to take this user-centred approach even further. By connecting the visual language of a brand, product or service to the target user, I can influence how something is perceived and experienced. Using this to my advantage, I as a designer can create more

meaningful designs that entice, attract and engage users.

Whilst collaborating with others, it often leads to me taking on the role of a pro-active leader. I strive to create an environment where the team and the project can really thrive. My assertiveness enables me to keep a good overview of the process and progress, making sure that the project is well managed and good communication amongst members is established. I highly value learning from others as they might be able to broaden your perspective, allowing you to explore new avenues and make new discoveries. Through continuous reflection on our own work and group dynamic, we can adapt our process and team through the challenges we face. Taking this reflective approach will not only enable a more iterative but also a more optimized process, which is why I apply this approach in my own projects as well.

I believe that my graduation project will fit seamlessly with my identity as a designer. As a self-identified educational designer, my preferred domain to work in is education. I have done many projects in the past where I have been able to explore the various levels, contexts and stakeholders that this domain has to offer. These projects often focused on secondary school whereas my M2.1 and FMP will focus on higher education. This will not only challenge myself as an educational designer but also allow me to build upon my current (context-related) skills. Using my devotion to personal and professional development (PPD) in combination with my expertise in user-centered design, I feel confident in my ability to design even more tools for graduate students at ID that support them with PPD.

figure 2 – Identity Picture Portfolio

My Vision

The continuously changing world enables us to explore never-before avenues through products, services, technologies and more. To make sense of it all, is to grasp the complexity that comes with an ever changing world that in turn creates new problems and challenges for us all to solve. In this ever changing world it can be hard to make sense of your individual role in that world. Education, for example, is primarily designed to set us up with several basic skills we need to survive and thrive. Secondly, it also aims to help us discover who we are and what we want in life but that does not always goes as intended. The Dutch educational system insert programs like career orientation into our schools but fail to make it standard across the board [1] which results in everyone taking a different approach to guiding students in their personal and professional development. Everyone is different and explores who they are and what they want in their own way. Without good support, people might make mistakes that can impact the individual but also society greatly. Think of problems like selecting the wrong study [2] or career [3]. I believe that we as designers could provide a great deal of support with this personal and professional development as we are able to combine the individual and collective needs in this self-discovery journey that we all partake in. The things we then are able to create with a user-centred approach allow us to design tailor-made solutions, created to target real difficulties or challenges experienced by people within this process. As a society we should aim for the development of the self but the key is to have a good support systems in place, which is where we as designers could come in handy.

Seeing the world through a user lens allows us to fully focus on understanding who it is we are really designing solutions for. It creates a strong foundation to build from which will not only result in better overall user experiences but will also add more value in the work that we create. Especially within the domain of education, a good understanding of the ecosystem and its stakeholders is crucial to the development of impactful tools. I think as designers we should always aim to add value and purpose, allowing the user to really benefit from the things we create. There are so many educational tools out there not really designed from a students' perspective or a teacher's perspective which cause them to be wasted potential. Taking our time to understand how the user lives and breathes will help create solutions to problems they are actually experiencing, on whatever scale that might be.

As a designer, I am motivated to take an user-centred approach to designing new products or services that enable societal changes, specifically in education. I believe that the best user experiences can be created by establishing a foundation that captures the essence of the user and its environment. For me, to design is to create real value and purpose to, for instance, guide and support people with their personal and professional development in order to increase happiness and satisfaction in life. But without understanding who and what it is you are designing for, you will not achieve it.

My current vision elaborates on the complexity that life and specifically education offers people. As a designer that mainly works in the domain of education, I aim to help people within this process through my work. My graduation project will be an extension of this where I aim to create more tools that target the complexity of figuring out what is next after graduation. By using my design skills, research opportunities and interests to my advantage, I strive to create these impactful solutions that target the needs of students and other stakeholders. I will not only be focusing on realizing this but also using this time to explore and expand upon my current perspectives as a designer. With the goal to be able to develop myself even further and discover what it is I want to do after graduation.
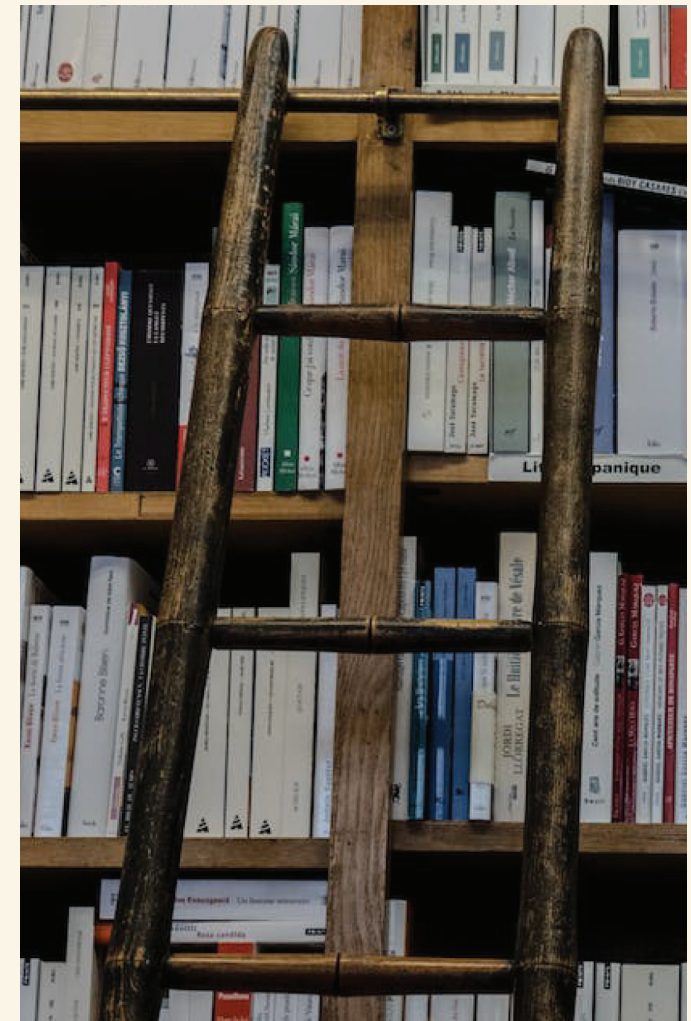
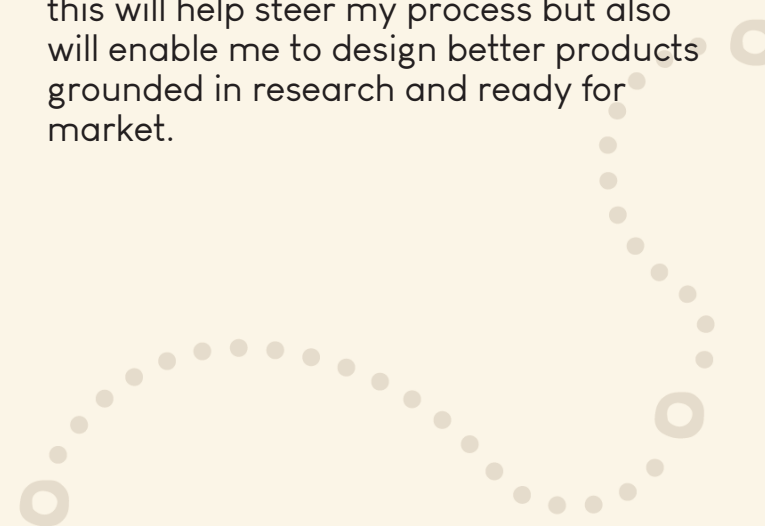

figure 3 – Vision Picture Portfolio

MY GOALS

This project enables me to explore a topic that resonates personally with me whilst also challenging me as a designer to develop myself further. I am able to use and apply the knowledge and skills I have acquired, with a focus on user and society as well as business and entrepreneurship. To make sure I can make the most of my graduation project, I have created several goals that will enhance my learning experience and enable me to develop my competence further.

1.   Stakeholder Engagement

Using my expertise in user-centered design, I want to continue developing further in this area as a designer. I want to use my time wisely and incorporate several user research activities that will help inform my design decisions. I aim to do this by using approaches and activities I have used in the past as well as ones I have not tried yet. I believe it is important as a designer to engage with stakeholders often as I find it crucial to creating valuable and meaningful designs.

2.   Business Development

Another expertise area of mine is within business development, using it as a tool to assess and evaluate my work and identify new opportunities. For this project, I want to continue this but also focus more on getting (external) validation for my designs and their strategies. I aim to achieve this by developing strategies simultaneously with the creation of the artifact, allowing me to interweave user and business activities in my process. I believe that this will help steer my process but also will enable me to design better products grounded in research and ready for market.

PLANNING

The goal of this project is to expand the world of Expedition Career by developing more tools/games, or "artifacts", that target the needs of graduate students and other stakeholders at ID. These artifacts will focus on providing moments of reflection, conversation/discussion and/or community involvement/engagement.

In order to develop these artifacts, a user-centered approach will be taken in combination with a focus on business considerations and development. To successfully do so, a few success criteria were defined. These will be used as guides throughout the process.

1. The artifact should give students the support they need

2. The artifact should fit in the PPD education at ID, achieved through collaboration with the department

3. The artifact should be a desirable product, achieved through extensive stakeholder engagement

4. The artifact should have a good and evaluated business strategy

5. The artifact needs to fit in the world of Expedition Career, aesthetic-wise.

figure 4 – Success Criteria

Planning

1.   First phase
The playtesting sessions that did not take place will be planned and executed during this first phase. The data will then be analyzed and used for a pressure cooker to generate ideas for new artifacts.

2.   Second phase
The second phase marks the moment new user research will be prepared, done and analyzed. What type of user research will be used will be determined during the pressure cooker. Next to this, simultaneous iterations will be done for creating business strategies and developing the ideas further based on initial findings.

3.   Third phase
This phase marks the development of the artifact(s) including the pilot and testing moments. There is room for improvement and further development as well. The final artifact will then be presented on Demoday.

4.   Fourth phase
The fourth phase is the wrap-up, here there will be room for working on the report, the portfolio and preparing for the final presentation.

*the business analysis and development is integrated in almost all ideation activities, as it will be regarded as an explorative activity too
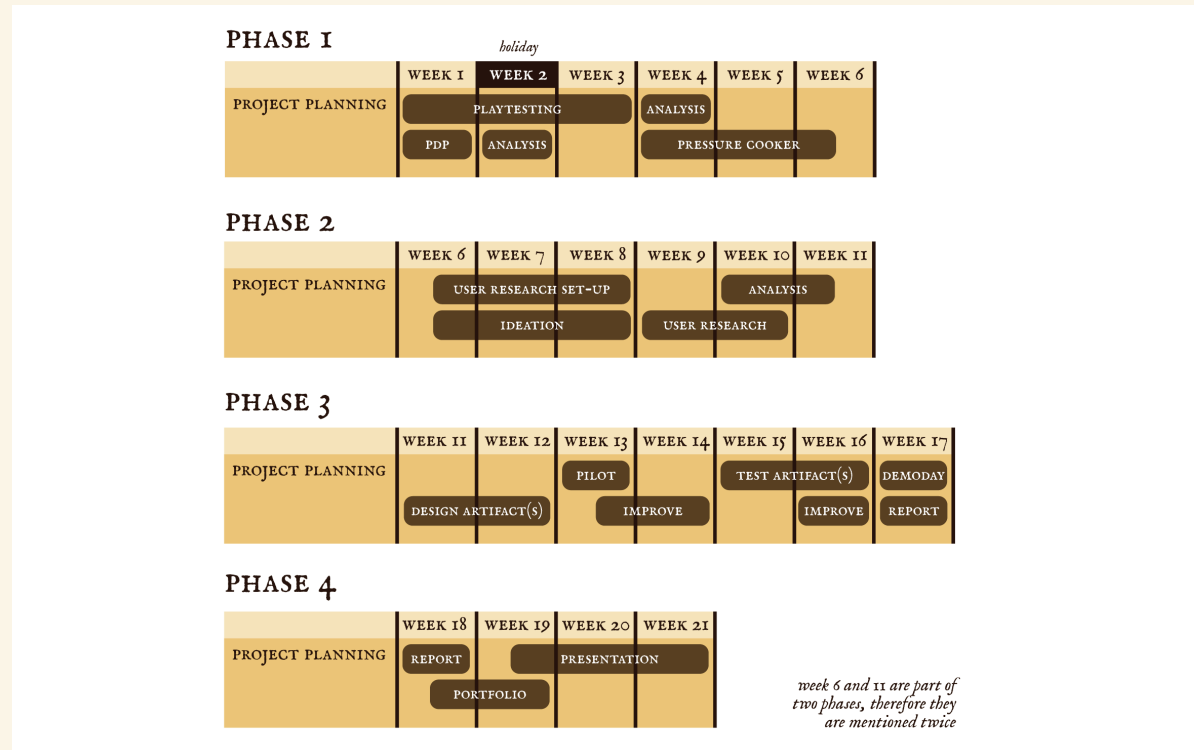

figure 5 – Planning

CONCLUSION

This project is of great importance to Eindhoven University of Technology and one of its research groups, Systemic Change at Industrial Design. The goal of the project aligns perfectly with the departments mission to enable societal change and the research group's mission of creating impact on groups of people in order to address larger-scale issues. By pursuing this project, I am taking the opportunity to contribute to these missions whilst making a meaningful impact on the field of education design.

By actively participating in this project I will be able to challenge myself and opening up the possibilities of discovering new paths of personal and professional development. I can apply the knowledge and skills I have learned in combination with the creative mindset I have to a project where I can make a real difference for the development of career guidance services and tools. With this project, I aim to contribute to the continuous innovation of education, creating better (learning) experiences for all stakeholders involved.

The opportunity I have as a designer to align myself with our department and university whilst also exploring a topic close to my heart, makes me excited for the challenge ahead. I am passioned about developing innovative solutions that fit with the TU/e's approach and vision on change. By practicing my expertise in user-centered design, business development and educational design I hope to create concrete outcomes that can positively impact the educational ecosystem and landscape.

REFERENCES

Ahmed, K. A., Sharif, N., & Ahmad, N. (2017). Factors influencing students' career choices: empirical evidence from business students. Journal of Southeast Asian Research, 2017(2017), 1–15.

Anastasiadis, T., Lampropoulos, G., & Siakas, K. (2018). Digital game-based learning and serious games in education. International Journal of Advances in Scientific Research and Engineering, 4(12), 139–144.

Arnoldi, J., Kempland, M., & Newman, K. (2022). Assessing student reflections of significant professional identity experiences. Currents in Pharmacy Teaching and Learning, 14(12), 1478–1486.

Athanasou, J. A., & Van Esbroeck, R. (2008). International handbook of career guidance (pp. 115–129). Dordrecht, The Netherlands: Springer.

Baptista, R., Coelho, A., & de Carvalho, C. V. (2015, January). Relationship between game categories and skills development: Contributions for serious game design. In Proceedings of the European Conference on Game Based Learning (Vol. 1, pp. 34–42).

Beausaert, S., Segers, M. R., van der Rijt, J., & Gijselaers, W. H. (2011). The use of personal development plans (PDPs) in the workplace: A literature review. Building learning experiences in a changing world, 235–265.

Boerlijst, J. G. (2013). Career development and career guidance. In A Handbook of Work and Organizational Psychology (pp. 273–296). Psychology Press.

Brandtstädter, J. (2009). Goal pursuit and goal adjustment: Self-regulation and intentional self-development in changing developmental contexts. Advances in Life Course Research, 14(1–2), 52–62.

Brookfield, S. D. (2009). Self-directed learning. In International handbook of education for the changing world of work: Bridging academic and vocational learning (pp. 2615–2627). Dordrecht: Springer Netherlands.

Bullock, K., & Jamieson, I. (1998). The effectiveness of personal development planning. The Curriculum Journal, 9(1), 63–77.

Czepiel, J. A. (2020). Competitor analysis. In The Routledge Companion to Strategic Marketing (pp. 125–140). Routledge.

Clegg, S., & Bradley, S. (2006). Models of personal development planning: Practice and processes. British educational research journal, 32(1), 57–76.

Checa, D., & Bustillo, A. (2020). A review of immersive virtual reality serious games to enhance learning and training. Multimedia Tools and Applications, 79, 5501–5527.

Chou, Y. K. (2019). Actionable gamification: Beyond points, badges, and leaderboards. Packt Publishing Ltd.

Christie, F. (2016). Careers guidance and social mobility in UK higher education: practitioner perspectives. British Journal of Guidance & Counselling, 44(1), 72–85.

Corrigan, S., Zon, G. D. R., Maij, A., McDonald, N., & Mårtensson, L. (2015). An approach to collaborative learning and the serious game development. Cognition, Technology & Work, 17, 269–278.

Crisan, C., Pavelea, A., & Ghimbulut, O. (2015). A need assessment on students' career guidance. Procedia-Social and Behavioral Sciences, 180, 1022–1029.

Davies, R., & Preston, M. (2002). An evaluation of the impact of continuing professional development on personal and professional lives. Journal of in-service education, 28(2), 231–254.

Day, C. (1994). Personal development planning: a different kind of competency. Journal of In-Service Education, 20(3), 287–302.

Dey, F., & Cruzvergara, C. Y. (2014). Evolution of career services in higher education. New directions for student services, 2014(148), 5–18.

Dodd, V., Hanson, J., & Hooley, T. (2022). Increasing students' career readiness through career guidance: measuring the impact with a validated measure. British Journal of Guidance & Counselling, 50(2), 260–272.

Donohue, R., & Patton, W. (1998). The effectiveness of a career guidance program with long‐term unemployed individuals. Journal of Employment Counseling, 35(4), 179–194.

Edmunds, R., & Richardson, J. T. (2009). Conceptions of learning, approaches to studying and personal development in UK higher education. British Journal of Educational Psychology, 79(2), 295–309.

Evans, A., Ali, S., Singleton, C., Nolan, P., & Bahrami, J. (2002). The effectiveness of personal education plans in continuing professional development: an evaluation. Medical Teacher, 24(1).

Fernandes, R., & Bance, L. O. (2015). Impact of career thoughts, parental support and career decision-making self-efficacy on adolescents' career indecision: Basis for career guidance program. International Journal of Education and Management Studies, 5(2), 101.

Friedman, A., & Phillips, M. (2004). Continuing professional development: Developing a vision. Journal of education and work, 17(3), 361–376.

Gordon, J. (2003). Fostering students' personal and professional development in medicine: a new framework for PPD. Medical education, 37(4), 341–349.

Gough, D., Kiwan, D., Suttcliffe, K., Simpson, D., & Houghton, N. (2006). A systematic map and synthesis review of the effectiveness of personal development planning for improving student learning.

Hansen, E. (2006). Career guidance: A resource handbook for low-and middle-income countries. Geneva: ILO.

Hiebert, B., Schober, K., & Oakes, L. (2014). Demonstrating the impact of career guidance. In Handbook of career development: International perspectives (pp. 671–686). New York, NY: Springer New York.

Hiemstra, R. (1994). Self-directed learning.

Hodkinson, P., Bowman, H., & Colley, H. (2006). Conceptualising transitions from education to employment as career development and/or learning. Institute of Career Guidance.

Holman, J. (2014). Good career guidance. The Gatsby Charitable Foundation, London.

Hooley, T., & Dodd, V. (2015). The economic benefits of career guidance.

Hunicke, R., LeBlanc, M., & Zubek, R. (2004). MDA: A formal approach to game design and game research. In Proceedings of the AAAI Workshop on Challenges in Game AI (Vol. 4, No. 1, p. 1722).

IJsselsteijn, W. A., De Kort, Y. A., & Poels, K. (2013). The game experience questionnaire.

Kalchik, S., & Oertle, K. (2010). The Integral Role of Career Development in Supporting Programs of Study and Career Pathways. Transition Highlights. Issue 1. Office of Community College Research and Leadership.

Laamarti, F., Eid, M., & Saddik, A. E. (2014). An overview of serious games. International Journal of Computer Games Technology, 2014, 11–11.

Lairio, M., & Penttinen, L. (2006). Students' career concerns: challenges facing guidance providers in higher education. International Journal for Educational and Vocational Guidance, 6, 143–157.

Lodders, N., & Meijers, F. (2017). Collective learning, transformational leadership and new forms of careers guidance in universities. British Journal of Guidance & Counselling, 45(5), 532–546.

Maguire, M. (2004). Measuring the outcomes of career guidance. International Journal for Educational and Vocational Guidance, 4, 179–192.

Mittendorff, K., Jochems, W., Meijers, F., & den Brok, P. (2008). Differences and similarities in the use of the portfolio and personal development plan for career guidance in various vocational schools in The Netherlands. Journal of Vocational Education and Training, 60(1), 75–91.

Moly, T. M. (2007). Career guidance through libraries in higher educational institutions.

OCW. (2016). Wijziging regeling examenprogramma's voortgezet onderwijs. Staatscourrt van het Koninkrijk der Nederlanden. https://zoek.officielebekendmakingen.nl/stcrt-2016-23925.html

OECD. (2004). Career guidance: A handbook for policy makers. Paris: Organisation for Economic Co-operation and Development, & Organisation for Economic Co-operation and Development Staff.

Orellana, N. (2015). Extending the Scope: Career Guidance in Higher Education. Global University Network for Innovation (GUNI).

Pisarik, C. T., Rowell, P. C., & Thompson, L. K. (2017). A phenomenological study of career anxiety among college students. The Career Development Quarterly, 65(4), 339–352.

Plesa, R., Prodanciuc, R., Stegar, I., & Ilioni, C. (2016). The importance of career guidance and counseling services according to the beneficiaries. Annals of the University of Petroşani. Economics, 16(2), 93–100.

Ragan, D. D. (2018). A Structured Course for Personal and Professional Development. Honors in Practice, 14, 43–57.

Ravyse, W. S., Seugnet Blignaut, A., Leendertz, V., & Woolner, A. (2017). Success factors for serious games to enhance learning: a systematic review. Virtual Reality, 21, 31–58.

Rhoton, J., & Bowers, P. (2001). Professional development: Planning and design. NSTA Press.

Robertson, P. J. (2013). The well-being outcomes of career guidance. British Journal of Guidance & Counselling, 41(3), 254–266.

Susi, T., Johannesson, M., & Backlund, P. (2007). Serious games: An overview. Stapleton, A. J. (2004). Serious games: Serious opportunities. In Australian Game Developers' Conference, Academic Summit, Melbourne.

Stege, L., Van Lankveld, G., & Spronck, P. (2011). Serious games in education. International Journal of Computer Science in Sport, 10(1), 1–9.

Te Wierik, M. L., Beishuizen, J., & Van Os, W. (2015). Career guidance and student success in Dutch higher vocational education. Studies in Higher Education, 40(10), 1947–1961.

Wang, C., & Huang, L. (2021). A Systematic Review of Serious Games for Collaborative Learning: Theoretical Framework, Game Mechanic and Efficiency Assessment. International Journal of Emerging Technologies in Learning, 16(6).

Warps, J, Nooij, J, Muskens, M., Kurver, B. & v.d. Broek, A. (2017). Landelijk onderzoek naar de uitvoering en opbrengsten van de studiekeuzecheck. ResearchNed.

Webster, R., & Andre, J. (2018). Flexible Student Alignment for Self-Directed Learning and 21Century Skills Development. Proceedings of SEAMEO 2018: Leadership and Management in Higher Education: Innovations and Best Practice.

Wouters, P., Van der Spek, E. D., & Van Oostendorp, H. (2009). Current practices in serious game research: A review from a learning outcomes perspective. Games-based learning advancements for multi-sensory human computer interfaces: techniques and effective practices, 232–250.

Whiston, S. C., Mitts, N. G., & Li, Y. (2019). Evaluation of career guidance programs. International handbook of career guidance, 815–834.

Zhonggen, Y. (2019). A meta-analysis of use of serious games in education over a decade. International Journal of Computer Games Technology, 2019.

Zinovyeva, T., Afanasyeva, Z., Bogdanova, A., & Leonovich, E. (2020). Study of The Teacher's Readiness Condition to Implement the Idea of Managing the Personal Trajectory of Professional Development Within the Framework of Digitalization of Education. In SHS Web of Conferences (Vol. 79, p. 01020). EDP Sciences.

APPENDIX

The Appendix can be found in a seperate document.
This is an overview of its contents.