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Holistic Perspective to Individual Study Plan: Personal Development Project Plan

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Abstract. How could we reinvent the Individual Study Plan (ISP) in order to promote students' study planning? What kind of ISP model could truly motivate students?

Based on graduate feedback we know that students feel they should have learned more about project management. That observation led to integrating project planning and management elements with individual study planning into the Personal Development Project Plan (PDPP) in a course setting.

PDPP was co-designed with students. The aim was to design something that would help students track their achievements and plan their personal development, i.e. match personal development with project planning. PDPP puts all the focus on the individual level. Through an iterative and incremental process, students are intended to find their own personal targets and design the means and tools to track how they're advancing towards set targets. We see PDPP as a way to manage the expectations one faces as well as a tool for managing one's well-being.

Through the PDPP process, students learn how they can take ownership of their studies. This should result in students having improved time management skills and the ability to reach 60 ECTS credits per academic year while increasing their probability of completing their degrees in the normative timeframe. These factors are also elements of the university's funding model, thus the use of PDPP could be seen as an investment.

To date, we have early non-formal results indicating that more credits are completed by the students who have participated in PDPP compared to those who have not. Student feedback and teacher observations indicate positive learning experiences and effective learning in extracurricular skills and life planning.

Keywords. personal development, project plan, student success, holistic approach, flipped learning, higher education, personal study plan

1. Introduction

Personal Development Project Plan (PDPP) is a framework created in cooperation with students at the Aalto University School of Engineering. The first prototype of PDPP was held in spring 2015. It was created as part of Saara Meriluoto's (second author) pedagogical training. Ville Kivimäki (first author) was one of Meriluoto's supervisors during her training.

In this article, we introduce how PDPP has been developed from the first prototype created in 2015 to the individual university course of today. The design process started

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from a manifesto: "the digital age has killed individual study planning". In our setting PDPP has been part of a course or an individual course.

As a result of the Bologna Process, ISP became compulsory for every upper secondary school student in Finland in 2005. Many different types of ISP have been introduced since then. Early versions of ISP contained a multidimensional approach to studies. Many paper-based forms used in ISP covered multiple dimensions of study life: personal strengths/weaknesses, a study plan and work-life planning. In recent years, the digital age has simplified ISP into a one-dimensional course selection timetable:

> "The personal study plan describes the study path you intend to follow in order to complete your degree and is the key tool for planning your studies. The PSP includes all the courses you are planning to take in each academic year and semester. The degree structure of your Master's programme forms the basis for your study plan but in most cases there is room for individual choices, especially when it comes to elective studies.
>
> The personal study plan is submitted electronically through WebOodi [study registry system]. The deadline for submitting your first PSP is **31st of October** of the first year of your Master's studies. The plan is checked by the Learning Services of the programme and approved or sent back to you for revision within one month from submission." [1]

In some cases, the only freedom left in the plan is in choosing elective studies. A holistic view of student life has not been designed into this process. It is not hard to see why students might perceive the ISP as just another compulsory task they are forced to do.

In this paper, we share the process of how PDPP was designed in the Aalto University School of Engineering during 2014–2018. We share the theoretical background, illustrate key principles and discuss the experienced effects of PDPP. We present the results in section 3 in a chronological order to illustrate the cyclical development process of PDPP.

1.1. Purpose of the work

In 2005, regulations were placed on maximum study times. After 2005, students admitted to universities have seven years to complete their bachelor's and master's degrees. The normative timeframe is five years: three years for the bachelor's degree (180 credits) and two years for the master's degree (120 credits).

In the Finnish university core funding model of 2017 [2], from the Ministry of Education and Culture, 3/4 of the education-related funding is based on the number of completed degrees and the amount of students who complete a minimum of 55 credits per academic year. In a larger context together with direct research and strategy-based funding, the basic degrees and 55 credit students generate 29% of Ministry funding. Based on national statistics, only 44% of students reached 55 credits in academic year 2016–2017 [3].

ISP is used as a tool to monitor and guide students in planning their degree studies. However, ISP does not take into consideration the fact that students often take up part-time jobs during their studies or engage in other activities. Only 18% of graduated university students say they were not employed during their university studies [4]. For students, employment is one of the most significant reasons for lagging studies [5]. Not taking this dimension as a part of the ISP tends to lead into unrealistic study plans.

We see that students should plan their lives with a more holistic perspective. See Figure 1 for a clearer illustration of this.

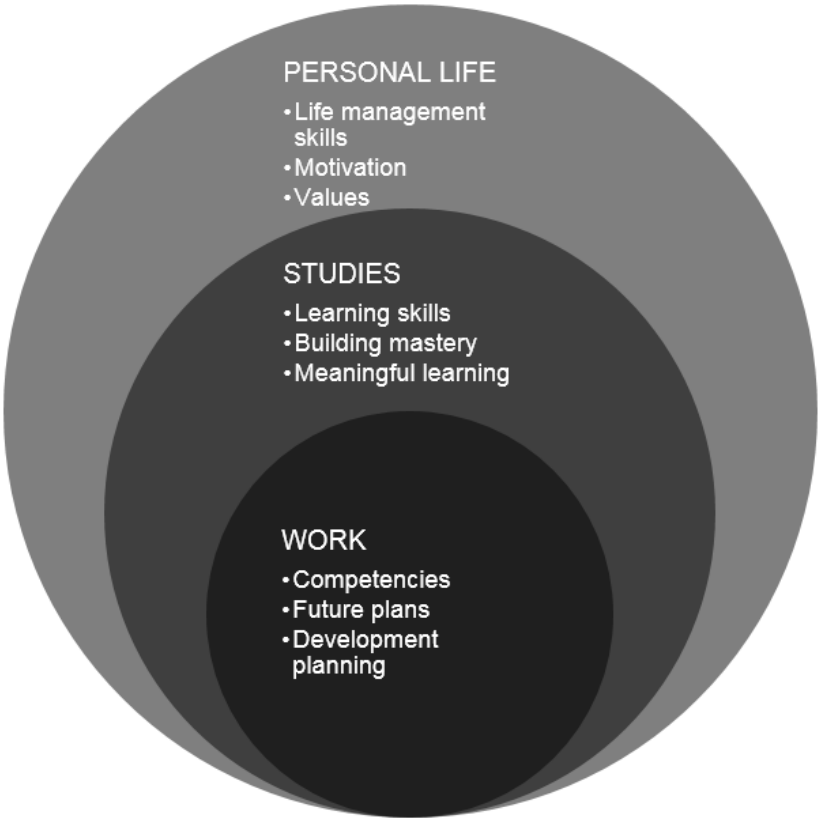

Figure 1. Holistic view of student life in the context of PDPP.

Universities in Finland have realised that nearly 20% of their students are at a risk of experiencing a burnout [6]. Similar results have been published by the Research Foundation for Studies and Education Otus, which has studied student life since 1989. In one of their publications, students were asked about how much stress they have experienced related to studies, work life or other areas of life during the past week. On a scale of 0 to 10, with 10 being the highest level of stress, 10% of the university student respondents selected 10. The second-highest stress level was selected by 14% of responding university students. [7]

In graduate surveys conducted by the trade union Academic Engineers and Architects in Finland TEK, students have been asked to evaluate their skills and expertise at the time of graduation. Year after year, project management skills have been at the top of the list when assessing importance. When assessing development in studies, the result has been the opposite: students do not see their project management skills developing significantly during their studies [5].

These background issues constitute a vexing problem. How can students study faster without sacrificing their well-being? What kind of new design would motivate students to use more time for planning their lives as a whole? And from the institutional viewpoint, how can we help students to graduate in normative timeframe, thus reaching the 55-credit target?

1.2. Theoretical background

Universal Design for Learning (UDL) was built in the early 1990s on research in neuroscience and in education. The origins of UDL connect closely with the development of digital technology. In the 1980s, the focus was on building solutions for learners. [8] The focus later shifted to institutional approaches:

"The education community began to recognize that many students— not just students with disabilities— faced barriers and impediments that interfered with their ability to make optimal progress and to develop as educated and productive citizens." [8]

UDL supports multiple means of engagement by "offering a choice of content and tools, providing adjustable levels of challenge and support" [9]. Understanding individual differences is paramount with regard to students with disabilities. We see that the same basic design principles adopted in UDL can work with all students. However, where UDL tends to refer to adapting curricula to the needs of diverse learners [6], our approach with PDPP centres on the learner.

Learner-centred teaching (LCT) is based on the assumption that learning is changes in the neuron networks of the brain [10]. In the triarchic theory of learning, the brain systems that support learning are divided into three hierarchically organised learning systems: a representation system, a cognitive control network and a metacognitive system [11]. These findings in brain research lay a foundation for PDPP, as our iterative and incremental approach aims to utilise the human brain's capabilities to adapt previously learned skills to a new environment. Although we are interested in teaching students to become better learners, we let students prepare their PDPPs for any purpose, such as 'running my first marathon'. A seemingly irrelevant topic can affect metacognitive skills so that executing other tasks becomes easier [11].

New theories around self-regulated learning (SRL) have emerged during the last three decades. PDPP ties in closely with one of the oldest theories of SRL, Zimmermann's Cyclical Phases Model (see [12] and [13]). This model considers person, behaviour and environment as interconnected through strategy use and a feedback loop. Here "self-regulation involves triadic processes that are proactively as well as reactively adapted for the attainment of personal goals." [13]. Zimmermann [13] breaks the social cognitive perspective, self-regulatory processes and accompanying beliefs down into three phases: forethought, performance or volitional control and self-reflection processes. PDPP workshops connect with forethought through goal-setting, strategic planning, boosting the student's self-efficacy and goal orientation. Recent studies have found goal-oriented learning correlating positively with self-regulation (see e.g. [14]). To us, this suggests that mastery and performance can be adopted as learning strategy, or at least that working towards this opens up new possibilities.

Turning in draft versions of one's PDPP is intended to contribute to the student's self-control. Reflecting the student's plans with the PDPP teacher's comments and suggestions for next steps are designed to boost the student's self-observation. These actions are aligned with Zimmermann's [13] performance or volitional control. Self-

reflection happens throughout the PDPP process, as each version of PDPP is preceded by a round of feedback, where the student evaluates what they have done and, after receiving the teacher's thoughts, reacts to the new situation and continues to reset their next tasks, thus starting the cyclical phase again.

Teacher control and the selection of the core subject of students' PDPPs can vary a lot. In this respect we can see PDPP facilitating flipped learning (FL), popularised by Jon Bergmann and Aaron Sams [15]. The concept, however, is closely linked with much earlier model of peer instruction [16], which dates back to the 1990s.

PDPP starts with warm-up question fashioned after just-in-time teaching, JiTT (see [17]),: "What is your PDPP?" The student's response lays the foundation for the future teaching-learning team formed by student and teacher. JiTT has been linked closely with the use of technology, even though the technology itself is not in a leading role. In JiTT, technology is seen to bridge out-of-class learning experiences with in-class experiences. JiTT-style practices seem to facilitate deeper learning, but results vary significantly. Successful implementations, however, seem to lead to moderate or quite significant cognitive gains. [18]

Personal development in this paper is seen from a wide perspective. It is not linked to any specific Personal Development Plan (PDP) and it is closely connected to personalised goal setting. At the roots of PDPP is the finding of similar results around goal-setting approaches that have been proven to be effective in a variety of settings, from sports [19] to nutrition [20] and from learning in medicine [21] and mathematics [22] to human resource management [23].

The ultimate basis for PDPP is in Maslow's hierarchy of needs. People have an inner need for personal development, as Maslow [24] indicated. According to Maslow's definition of self-actualisation, what man could be, he should be. The forms of self-actualisation differ between different individuals [24]. We see PDPP as a tool for helping students fulfil their need for self-actualisation.

2. Methods

The majority of this study has been conducted using qualitative methods. However, quantitative methods have been used for point measurements in key points of the design process.

2.1. Action research

In this study, the authors have been active participants and researchers in the design process. The authors have had a key role in deciding on the steps that would be taken in the design process. Researchers have also been the main actors in the teaching activities of PDPP courses. Participatory action research (PAR) [25], in this case lays the methodological framework for this study.

Action research starts from defining a problem that needs to be solved. The problem has been defined as the notion that ISP is one-dimensional, has little to do with true planning and is not perceived as meaningful by students. Formulated into a research question: Could we achieve a dynamic design that accommodated everyone, despite differences in goals and learning styles, while being something that every student considered meaningful to themselves?

2.2. Design process

The PDPP design process (see Figure 2) made use of the continuous development framework known as Deming's circle or the Plan-Do-Check-Act (PDCA) cycle, based on William Edwards Deming's lectures on quality management in the 1950s. In this framework, improvement starts from planning that is executed in the do phase. The product is then checked, i.e. an assessment is made into whether it does what it was planned to do. Based on the check phase, the act phase then utilises the data collected to propose modifications for next iteration round.

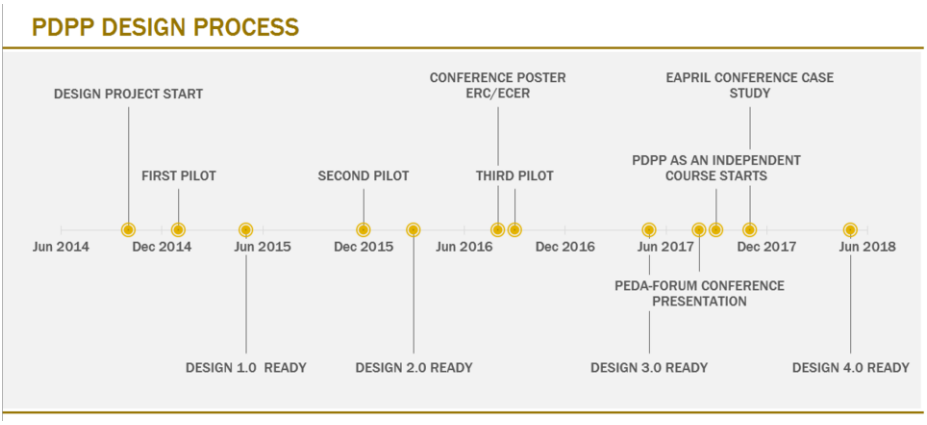

Figure 2. The PDPP development process as it happened between 2014-2018.

The design process was carried out by utilising design thinking. The framework used in this case was the Stanford D.School 5-step Design Thinking Process [26]:

- Empathise: Centrepiece, a mode to understand people within the context of a design challenge
- Define: Bringing clarity and focus to the design
- Ideate: Creating source materials for prototype
- Prototype: Making a prototype
- Test: Piloting with the prototype

Design also made use of the PDCA cycle for continuous development:

- Plan: Design thinking process
- Do: Pilots 1, 2, 3 and 4
- Test: Pedagogical project course, teacher observations, student performance monitoring, conference poster (ECR/ECER), conference presentation (Peda-forum), Case study (EAPRIL)
- Act: Design 1, 2, 3 and 4.

3. Development of PDPP

The very beginning of the process started on a pedagogical course the first author participated in. Pilot 1 was also carried out under this project-based pedagogical course. The second author was doing her teacher training in the pilot.

3.1. First pilot (2014-2015)

The design process for the first pilot was broken down into the following phases:

- *Empathise:* Author 1 tried to think like a student and figure out what kind of planning would generally motivate students who are 19 years of age, having just finished their upper secondary school studies. Students go to study mainly because they want to work in their field of study after graduation. Project planning skills were found to be the key skill that was not promoted in the curriculum enough in relation to the demand observed in national surveys conducted soon after graduation. Could study planning be more like project planning activity?
- *Define:* For this, author 1 consulted a fellow researcher and a professor to further define the problem and possible solutions. The theoretical background was derived from a personal development framework.
- *Ideate:* Bringing together two frameworks: personal development and project management.
- *Prototype:* To build a working prototype, author 1 needed a pilot group consisting of actual first-year students. He was able to get 7 students to participate in this pilot.
- *Test:* The redefined prototype was implemented in the first-year curriculum for the following academic year, as an optional one-credit course addition.

3.1.1. Design 1.0

Teaching was delivered through three lectures, where identical double lectures were also offered, and two individual coaching meetings (Table 1).

Table 1. First pilot course design

Lecture 1 Project management	**Lecture 2 Personal development plan 1**	**Lecture 3 Personal development plan 2**	**Coaching meeting 1**	**Coaching meeting 2**
Theme: Course description, project management, risk management, portfolios	Building expertise, growing as an employee and master of science	Personal development plan, justification, examples	Personal development plan status, next steps	Personal development plan status, next steps, feedback
2 hours	2 hours	2 hours	30 min	30 min

Students were asked to bring their personal computers to the lectures and especially to individual meetings. Face-to-face meetings and small group meetings were used to make sure we could get real user information: feelings and spontaneous reactions.

For one student teaching was arranged in the form of three 60-minute coaching meetings. This experience later played central role in more coaching focused designs of PDPP, mainly designs 2 and 4.

3.2. Second pilot (2015-2016)

Teaching was delivered through two lectures, one of which was compulsory. Two teachers conducted this pilot phase, the first author and one course assistant.

PDPP was taught as an elective one credit part of the bachelor's programme's introductory course Orientation to Bachelor Studies in Engineering. Enrolment for PDPP was conducted by using the group enrolment feature in the Moodle-based LMS. 55 students enrolled, 25 attended the PDPP lecture and 22 eventually finished their PDPPs.

Table 2. Layout of second pilot setting. The key design feature is the workshop and the submission of the nearly finished PDPP, i.e. 0.9 version.

	Lectures	Workshops	Submissions	Retrospective
Amount	2	5	2	1
Length	2 hours	2 hours	2 hours	
Compulsory	First one	No	Yes	No
Student participation	25	26 (times students attending different workshops)	22 + 22	22
Offering	First lecture with identical double lecture available	Live workshops and online teacher contact possibility	Online submission	E-mail sent by teacher

3.2.1. Design 2.0

At this stage of the design process, the PDPP focused on delivering teaching through coaching. Students' PDPPs were revised by course teachers and developed on-site.

Author 1 learned through coaching meetings that practically every student began to understand the goal and reason for preparing a PDPP when they actually started working on it. For the teaching concept, this may mean that too much emphasis should not be put on lectures but rather on providing coaching and help for compiling the PDPP, starting from a tiny piece and building iteratively from there.

At the end of the first lecture one student said that her mother works as a professional coach for company executives, providing tools for time management, prioritisation, etc. She later told author 1 that she doubts the course could offer her anything new. Surprisingly, the same student showed up for the next lecture. She had come to realise that during the first lecture she, for the first time ever, started to plan her life five years ahead.

The cornerstone of the PDPP concept was actually derived from the use of Excel spreadsheets: It is not what you do but rather how you do it. One student opened up in a coaching meeting and told us that during this course she actually launched Excel for the first time ever and one student commented that he learned more Excel here than on a specialised IT course.

3.2.2. *Conference poster ERC/ECER*

As the PDPP concept started to form author 1 published a poster in 2016, see Figure 1. Here the iterative and incremental process was first time visualised by author 1.

Figure 3. Excerpt from a poster published in ERC/ECER conference 2016.

3.3. *Third pilot (2016-2017)*

Here, PDPP was a more integral part of the Orientation to Bachelor Studies in Engineering course. The course had the following components:

- Pre-assignment: motivation, career and learning styles
- Orientation week
- Orientation to IT services
- Math skills base test
- Library assignment
- Six learning assignments: time management, personal learning style, project management, career planning, minor subject comparison analysis, plan for exchange studies
- Individual Study Plan

The PDPP framework influenced items 1 and 6. If the student opted to prepare their PDPP during the course and earn an extra credit, they needed to pack the learning assignments and the ISP together with other sections that support the student's ability to

monitor their study progress, risk recognition, risk preparation and acquisition of career-relevant skills.

Table 3. PDPP themes were an integral part of the entire orientation course in academic year 2016–2017. Some students finished the course and/or PDPP afterwards during the spring term.

Item	Participants	Compulsory
Course enrollment	309	Yes
Pre-assignment	131	No
Project management	153	No
Time management	237	Yes
Personal learning style	78	No
Minor subject comparison analysis	64	No
Career planning	142	No
Plan for exchange studies	42	No
Finished PDPP (1 ECTS)	130	No
Finished course (2 ECTS)	237	Yes

3.3.1. Design 3.0

This design was highly integrated with the existing Orientation to Bachelor Studies in Engineering course. This time, 130 students finished their PDPPs. This made it possible to have summative feedback after the course.

Key findings from this pilot and design were that students assessed the PDPP and the multiple learning assignments as bringing too heavy a workload to the course in comparison to the credits offered. However, many saw that the learning assignments and the especially PDPP were truly relevant for their studies and life planning.

We collected separate feedback from those students who had opted for the extra credit by preparing their PDPPs. This feedback clearly showed that students perceive PDPP as a truly important tool for themselves and that the idea is great. However, many felt that it was too challenging to accommodate PDPP in the first period of first-year studies.

3.3.2. Peda-forum conference

In the August of 2017, the authors participated in the Peda-forum conference and gave a presentation on how the students who thus far had completed PDPP are doing in their studies. Examples of PDPPs created by students were also presented.

3.4. PDPP as an independent course starts (2017-2018)

Starting with autumn 2017, PDPP has been an individual course offered for every student in the School of Engineering. We hold six-hour workshops every Thursday to support students. The process of PDPP 3.0 is pictured in Figure 4.

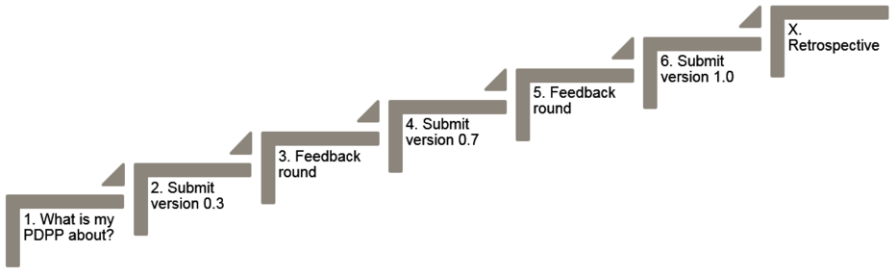

Figure 4. The student process on a PDPP course from autumn 2017 onwards.

The first step is to define what the PDPP is about for the student.

The second step is to prepare the first draft of the PDPP. After submitting the draft, we ask the student to attend the workshop to talk about how the student could keep developing from version 0.3 of the PDPP.

The third step is to define what the student will add to the next version, 0.7. This step is basically for the student to decide what ideas from the discussion they will use in the next version.

The fourth step is to submit the 0.7 version of the PDPP and to again receive ideas on how to develop it further. *The fifth step* is similar to the third.

The final step is to submit version 1.0 of the PDPP. We encourage the student to keep the PDPP updated and to develop it further when necessary. We believe that through this iterative and incremental process, students are able to find their own personal targets and design the means and tools for tracking how they are advancing towards set targets and this can be checked after the course in retrospective.

3.4.1. EAPRIL conference case study

In November 2017, the authors participated in the EAPRIL conference in Hämeenlinna, Finland. In the conference, we presented a case study about PDPP. During the presentation we mostly concentrated on the current version of the PDPP.

3.4.2. Design 4.0

While acquiring new information, students will most likely come across new terms and concepts. We do not want to have students get stuck with academic jargon. Students should construct their own perception of the topics relevant to their PDPPs and to deepen their understanding of new concepts just-in-time. For example, the teacher can present one project management framework, including time management, risk management, procurement management, change management etc. At first, it is relevant to understand that the project plan can be broken down into smaller subtasks or work packages and these into even smaller tasks. And because time management is seen as the most pressing issue in a student's life, the student decides to deepen their knowledge of that. The teacher then supports the student mentally by communicating that they can focus on that issue now and start building the time management dimension of their PDPP.

Table 4. The design has shifted toward more customisation and more freedom regarding time and space. Numerical assessment has been done by the authors.

Design continuum	Design 1.0	Design 2.0	Design 3.0	Design 4.0
Teacher-centric (0) - Student-centric (10)	3	6	4	9
Institutional goals (0) - Personal goals (10)	8	8	8	8
Prescheduled (0) - Just in time (10)	3	6	2	9
Project Planning (0) - Personal Development (10)	4	4	4	5
Contact teaching (0) - Distant learning (10)	2	6	4	7
Content (0) - Form (10)	5	5	5	5

4. Discussion

As mentioned, we believe that the development of a PDPP is an ongoing process. And through our course, we help the student take the first steps. As we worked on PDPP, it has become clear that the concept of PDPP is not related to studies alone.

PDPP can be used to plan basically anything. If we really want to make this simple, PDPP is a project to achieve something personal. In our point of view, one could make a PDPP, for example, about how to lose weight, change careers or – like in most of our cases – how to graduate in a given period of time.

The biggest advantage of PDPP is that it is made from a personal point of view. PDPP is definitely not a one-size-fits-all process. We, as teachers, should keep in mind that we ask students to create something that is useful for themselves, not for us.

Of course, one of the main ideas behind PDPP was to help students to earn more credits and graduate in normative timeframes. But as the design process continued, we understood that this process is about much more and could be used in other contexts beyond the university as well, in teaching and in services. PDPP was implemented, in our research, in a course context setting. It would be interesting to see PDPP implemented outside of the course setting, e.g. as a digital online application, part of academic advising or tutoring process or by replacing individual study planning process with PDPP.

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