

Reimagining Communication Studies in a Digital Age

Master's Thesis

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Tiivistelmä

Covid-19-pandemia haastoi yhteiskuntamme monin tavoin. Kouluissa ja yliopistoissa luokkahuoneet ja kampukset tyhjenivät, kun opetus siirtyi verkkoon. Tässä massiivisessa pakotetussa digitalisoinnin harppauksessa digitaalisten ratkaisujen joustavuutta hyödynnettiin laajamittaisesti, mikä johti muodollisen koulutuksen jatkumiseen tilojen suluista huolimatta.

Vaikka tekniikka pystyy tarjoamaan opetusta etäyhteyden välityksellä, kurssien yleinen rakenne juontaa juurensa byrokraattisesta järjestelmästä, joka ei perustu digitaalisen aikakauden joustaviin mahdollisuuksiin.

Tämä tutkielma esittää vaihtoehtoisen tavan järjestää yliopisto-opintoja esittelemällä ja testaamalla Communication Studies Tracker (CST) järjestelmän. CST on suunniteltu antamaan opiskelijoille mahdollisuus suorittaa yliopisto-tutkinnon pakolliset viestintäopinnot käymättä mitään erityisiä kieli- tai viestintäkursseja. Sen sijaan järjestelmä seuraa ja käsittelee opiskelijoiden tekemiä kommunikaatiotehtäviä, kunnes vaadittavilla kielillä ja kohdealueilla on kerätty riittävä määrä hyväksytyjä kokemuksia.

Yllä olevaan konseptiin perustuvan lähestymistavan toimivuuden arvioimiseksi järjestettiin CST:n käytettävyydestä, jossa viisi opiskelijaa ja viisi opettajaa testasivat järjestelmää ja keskustelivat sen taustalla olevasta konseptista. Tulokset osoittavat, että osallistujat kokivat, että CST lisäisi joustavuutta ja mielekkyyttä viestintäopinnoissa. Tämän lisäksi osallistujat kokivat konseptin toteuttamiskelpoiseksi Turun yliopistossa sekä soveltuvan hyvin yliopiston koulutustavoitteisiin.

Suurimmat haasteet liittyivät heikompien opiskelijoiden tukemiseen ja ryhmätyön koordinointiin. Opettajatestaajat ilmaisivat myös huolensa siitä, miten yliopiston hallinto toteuttaisi kurssittoman järjestelmän, kantaen erityisen huolen resurssien kohdentamisesta.

Asiasanat: Digitalisointi, käytettävyys, viestintä, opetussuunnitelman suunnittelu, affordanssit.

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Abstract

The COVID-19 pandemic challenged society in many ways. In schools and universities, classrooms and campuses were vacated as teaching moved online. In this massive, forced leap of digitalization, the flexibility of digital solutions was harnessed on a large scale, leading to formal education continuing despite the lockdowns.

However, despite technology providing possibilities to teach remotely, the overall organization of courses was still stuck in a bureaucratic system not built on the flexible affordances of the digital age.

This master's thesis presents an alternative way of organizing university studies, through the presentation and testing of the Communication Studies Tracker (CST). The CST is designed to allow students to complete their obligatory communications studies at university without having to attend any specific language or communication courses. Instead, the system would track and process communicative tasks done by students, until a sufficient amount of successful experience is gathered in the required languages and focus areas.

To gauge the viability of an approach based on the above concept, a usability test of the CST was organized, in which five students and five teachers tested and discussed the system and its underlying concept. The results show participants felt that the CST would provide increased flexibility and meaningfulness in communication studies. Further, participants felt the concept was viable and suitable for implementing at the University of Turku.

The main challenges discovered were related to support for weaker students and coordination of group work. The teacher testers also expressed concern regarding how a course-free system would be implemented by the university administration, especially concerning resource allocation.

Keywords: Digitalization, usability, communication, curriculum design, affordances

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1 Introduction

As a teacher, I resent grading student work. Based on my pedagogical training and experience of teaching, it often feels impossible to meaningfully, or even helpfully, boil down a learning experience into a five-step, one-dimensional assessment framework. Looking into the history of grading, Schneider & Hutt (2014) provide a reasonable explanation for this disconnect, as they demonstrate how grading has transformed from an internal communication within a learning context to an external communication between different education providers, domestically and internationally. The standardized systems have been created to allow assessors to provide a necessary variable to large numbers of students. However, at these quantities teachers cannot correctly gauge the highly personal process of learning with anything but an abstraction derived from a set of measurable metrics. In this way, grades have become a bureaucratic convenience while still retaining significant social meaningfulness and a veneer of pedagogical relatedness in the minds of learners and educational stakeholders. A recent step in this process of standardization in tertiary education was the Bologna process, which standardized credit systems in universities in Europe.

Perhaps this abstraction and standardization was a necessary evil as formal education became a given part of most children's lives, and the sheer number of assessments led to the need for an effective bureaucracy. However, the technological development of the 21st century has provided the means to process massive amounts of information. It is common knowledge these days that data analytics can analyze the habits of millions of online users to provide detailed psychographic information on an individual level. In the education sector, there is a lot of buzz around trying to harness this analytic capability to provide ever more accurate standardized, abstract, and transferrable variables with which to assess competence. But perhaps these tools could also be used to return assessment to its more formative roots, where feedback is a personal interaction between learner and teacher, while still creating a measurable output that can be used by bureaucracy.

The recent COVID-19 pandemic provided an interesting context for organization of education without access to physical classrooms. Although this caused quite a devastating disruption to operations, in a testament to the tenacity of our education system, universities were able to carry on offering courses through remote solutions like Zoom. In fact, the University of Turku Annual Report 2020 states that all targets for attained degrees were reached "especially well".

While I had already developed remote teaching solutions before the pandemic, the displacement of learning into a virtual setting showed on a much larger scale that it is now possible to be quite flexible in how learning experiences can be offered. However, this digital leap did not change the organizational structure of university studies. Students still needed to register for courses, and, especially in the case of language and communication classes at the University of Turku, often still had to attend 80% of lectures, even if these

were now taking place online. Also, course content mostly stayed the same, to the point this was possible during the pandemic, and courses were still offered in a one-size-fits-all format. The underlying university bureaucracy tends to set these factors as a default, even if technology would allow another approach.

To allow a more flexible approach at the organizational level of studies, there would need to be a system that offers students a chance to practice and demonstrate competence flexibly while still providing the study registry with the needed variables the bureaucracy expects. In this study, I present a potential solution for this.

I developed a design model for a tool for tracking student activity that would contribute to obligatory communication studies at university. The purpose of this *Communication Studies Tracker* (henceforth CST) is to provide learners with a feedback loop for communicative tasks they complete while studying at university, without having any specific courses for communication studies. The main role for teachers would be to assess and comment on the activity, while the system would take care of providing a standardized output showing administrators if the requirements for communications studies set by the degree program are met. This system would consider both intramural and extramural communication activity as eligible for credit.

To gauge how educators and learners would react to a concept of supporting development of communication skills without a course structure, I organized a usability test of the CST model where testers were able to familiarize themselves both with the design and the underlying pedagogical concept. My research question is:

How do learners and educators react to the proposed system of asynchronous communication studies, as experienced through a usability test of the CST and the ensuing discussion/interview?

As a lecturer of business communication at the University of Turku, I naturally chose to focus on the organization of communication studies. However, this focus can also be justified by the strategic importance of communication skills both during a student's study time and in their professional life. A study conducted by the Confederation of Finnish Industries (Elinkeinoelämän Keskusliitto) in 2014 found that, while the need for language and communication competence is increasing in industries, the general rate of studying languages in formal education is declining. Among their recommendations, they suggest integrating ICT more into language teaching, focusing on practical skill development and increasing interdisciplinary collaboration. The CST model directly addresses all these areas.

The hypothesis is that a more flexible system will be positively viewed by both students and teachers. As the current organization structure is constructed mainly to serve bureaucratic needs rather than pedagogical ones, a system designed to primarily support the learning experience of students should feel more useful for the student, while allowing teachers to feel like they can more meaningfully fulfill their professional purpose.

In Chapter 2, the theoretical framework for this study is presented. Chapter 3 demonstrates the CST design model in detail, as well as provides an insight into the underlying pedagogical concept. In Chapter 4, the research used for data collection and processing is introduced. The results from the study are then presented in Chapter 5, and the implications of these are discussed in Chapter 6. The seventh and final chapter provides a conclusion of the study.

2 Theory

In this chapter, I present the theories that served as a foundation for both the pedagogical concept and design of the CST model in this study. First, I introduce theories of self-determination and personalized learning, which lay the foundation for the pedagogical approach in the concept of the design model. Next, a theoretical argument for why language and communication studies are particularly well suited for this approach is presented via a brief introduction of complex dynamics system theory. Finally, I show how digital affordances, models of interaction and heuristic-based design practice provide guidelines for how to build the actual design model.

2.1 Self-determination and Personalized Learning

In their presentation of Self-Determination Theory (SDT) Deci and Ryan (2000) argue that three basic and innate psychological needs—competence, relatedness, and autonomy—need to be met for a person to perform optimally. The need for *competence* drives us to explore and be challenged, and provides an inherent feeling of satisfaction from learning things. *Relatedness*, for its part, is what drives us to be organized into and work within social groups and structures, as well as internalize information. Finally, *autonomy* is what makes us self-regulate and self-organized to adapt to situations, which is more effective than simply responding to external regulating stimulus. In other words, autonomy refers to our need for agency. Deci and Ryan note that there can be antagonism between relatedness and autonomy in less-than-ideal situations, but that the two needs generally complement each other.

Regarding this study, SDT provides a strong argument for designing a learning environment in which learners find challenges that they can respond to with others from the learning community, but in a way which allows them freedom to choose their timing, approach, and other factors.

Personalized learning (PL) is a wide concept that goes beyond the perhaps intuitive interpretation of considering it simply as customizing learning experiences around an individual's needs. Certainly, the definition provided by the US Department of Education, which states that personalized learning is “instruction in which the pace of learning and the instructional approach are optimized for the needs of each learner” (2016, 6) and further specifies that the learning activities should be connected to learners' interests, seems to match the intuitive impression of the term quite well. However, the process required when designing and implementing this type of instruction systematically in formal education is where the difference in scope becomes more apparent.

In a recent special issue of the *Journal of Research on Technology in Education*, Walkington and Bernacki (2020) show more comprehensively what the concept of PL means in practice. The studies presented in the issue provide insight of the scale of processes that are involved in designing and implementing PL approaches in formal education. For example, Kallio and Halverson (2020) found that, to allow for successful implementation of PL approaches,

education leaders must modify existing learning spaces and create technological solutions that benefit their specific contexts, as well as overhaul time allocation for teachers and staff.

The significant efforts required to implement PL approaches in formal education provide another convincing argument for the creation of a model for redesigning the context of communication studies. The proposed CST model would function as one technological solution tailored for this specific purpose and would also help facilitate the needed changes for allocation of instruction time. A design based on PL should also help create an environment in which the basic needs presented in SDT are met.

2.2 Complex Dynamic System Theory

Moving more specifically to the field of language and communication learning, Diane Larsen-Freeman (2019) proposes that language development takes place in a complex and dynamic system. Instead of being a static set of rules and linguistic objects that can be learned, she argues that second language development happens in an iterative and co-adapting cycle where patterns of language emerge through various interactions between actors. Co-adaptation, in this case, means that interactors adapt to each other in this process, instead of one part, the learner, simply adopting what another part, the instructor, outputs. On the topic of agency, Freeman argues that agency is not something possessed by an individual, but emerges from the relations of interactors within a system.

Larsen-Freeman (2016) also refers to affordances in relation to language development. She identifies two orders of affordances. On one hand, there are environmental affordances, which provide learners with the opportunity to develop. On the other hand, the learner must perceive and act upon these external affordances, which constitutes an internal affordance in the learners. This strengthens her definition of agency being an interactive quality, between the external and internal orders of affordance.

This ecological view of language development underscores a need to deviate from the typical one-size-fits-all approach of formal language education and supports the notion of developing environments for relational and emergent learning to take place. The nature of language development, as presented by Larsen-Freeman, also suggests that language and communication studies might be particularly well-suited for a personalized learning approach.

2.3 Digital Affordances and Models of Interaction

While the previous sections of this chapter have focused on the pedagogical foundations for this study, in the next two sections I focus on theory related to practices of digital design. I rely mostly on work by Janet Murray (2012) for the parts on affordances and models of interaction, and then briefly touch on Jakob Nielsen's ten principles for interaction (1994).

In digital design, Murray identifies four types of affordances: encyclopedic, spatial, procedural, and participatory. *Encyclopedic affordance* refers to digital media's ability to contain and transmit information. *Spatial affordance* refers to digital media having

perceived dimensions of navigable space. *Procedural affordance* refers to the ability of a digital medium to perform and show multisequential actions and measures. Finally, *participatory affordance* refers to the potential of digital media to present meaningful opportunities of interaction with an interactor.

<i>Information Spaces</i> <i>Virtual Landscapes</i> <i>Maps</i> <i>GPS Devices</i> <i>Navigation Conventions</i>	<i>Databases</i> <i>Archives</i> <i>Encyclopedias</i> <i>Portable media players</i> <i>Organizational Conventions</i>
Spatial	Encyclopedic
Procedural	Participatory
<i>Game engines</i> <i>Search engines</i> <i>Spread Sheets</i> <i>Sensort Devices</i> <i>Control Conventions</i>	<i>Blogs & Instant Messaging</i> <i>Media Sharing Sites</i> <i>Recommendation Systems</i> <i>Input Devices</i> <i>Icon/Command Conventions</i>

Figure 2.1 Murray's four digital affordances (2012:90)

Applying the two orders of affordance presented by Larsen-Freeman to Murray's digital affordances, we can see that the first three affordances can be regarded as external, but participatory affordances also allow consideration of the agency of the user. Murray comments on the inherent emergence in complex systems, reminding designers that emergence itself is not a strictly positive, but mainly unpredictable, attribute that needs to be kept in mind during the design process (Murray, 2012:148). This reminder should also be affirmed to designers of communication curricula, as many learning outcomes in course descriptions could be said to have a very linear idea of students simply absorbing course content.

The development of encyclopedic affordance in new media could be said to be the catalyst for being able to develop systems like the CST at all, as new media allows us to record and transmit interactions in a way that was impossible before. For example, in the past oral exercises had to be done and assessed in person but can now be carried out asynchronously. Oral interactions were ephemeral things, only lasting for the moment they were going on, but now they are easily stored and transmitted by devices commonly used by almost everyone.

This encyclopedic affordance can leverage procedural affordance, where a system can keep track of individual interactors taking asynchronous multisequential actions. It would be hard to imagine a teacher keeping track of a traditional class in which everyone does their own thing in their own time, but this is not a problem for a digital system. Finally, since a digital

system can keep track of where all students are at a given moment, it can also provide them the choice of what to do next. This shows how agency emerges from the participatory affordance.

The spatial and participatory affordances of the CST are at the forefront of study in the usability tests, as it was through navigating and interacting with the system that the testers formed their opinion of both the design and the underlying concept.

In addition to affordances, Murray also presents four models of interaction in digital media: tool, machine, companion, and game. The *tool model* describes a simple, often handheld artifact, which allows the user to do something more effectively. The *machine model* is more complex, carrying out processes that would be too complicated for the user to do themselves, but still requiring input from the user in order to produce a certain output. The *companion model*, however, is more autonomous and may take action on its own, once certain conditions apply.

The final game model presented by Murray slightly breaks the progression of increasing system autonomy. Instead, she presents aspects of game mechanics and gamification as aspects of the model. However, in the lecture videos for the course Principles of Interaction Design, offered at the University of Turku, Tomi Suovuo (2020) presents an alternative fourth model of interaction, the AI model. Where the companion model can take action without user input, it still does so based on some kind of pre-existing design. However, an imagined AI model could devise and modify its own actions, determined from data it collects.

The CST model falls into the categories of machine and companion, as it processes and demonstrates the progression of a student, while also prompting action in periods of inactivity. In order to qualify as an AI model, the system would need to be able to predict and recommend paths of progress for users.

2.4 Heuristics of good UI design

Finally, a useful guide for the design of the CST model's UI is the ten principles for good design of user interfaces, by Jakob Nielsen. While earlier sections cover the theoretical bases of this study, the following principles provide practical guidelines that served as a basis for design decisions of the CST design model. In brief, they read as follows:

1. Visibility of system status – The design should always keep users informed about what is going on, through appropriate feedback within a reasonable amount of time.
2. Match between system and the real world – The design should speak the users' language. Use words, phrases, and concepts familiar to the user, rather than internal jargon. Follow real-world conventions, making information appear in a natural and logical order.
3. User control and freedom – Users often perform actions by mistake. They need a clearly marked "emergency exit" to leave the unwanted action without having to go through an extended process.
4. Consistency and standards – Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform and industry conventions.

5. Error prevention – Good error messages are important, but the best designs carefully prevent problems from occurring in the first place. Either eliminate error-prone conditions, or check for them and present users with a confirmation option before they commit to the action.
6. Recognition rather than recall – Minimize the user's memory load by making elements, actions, and options visible. The user should not have to remember information from one part of the interface to another. Information required to use the design (e.g., field labels or menu items) should be visible or easily retrievable when needed.
7. Flexibility and efficiency of use – Shortcuts — hidden from novice users — may speed up the interaction for the expert user such that the design can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.
8. Aesthetic and minimalist design – Interfaces should not contain information which is irrelevant or rarely needed. Every extra unit of information in an interface competes with the relevant units of information and diminishes their relative visibility.
9. Help users recognize, diagnose, and recover from errors – Error messages should be expressed in plain language (no error codes), precisely indicate the problem, and constructively suggest a solution.
10. Help and documentation – It's best if the system doesn't need any additional explanation. However, it may be necessary to provide documentation to help users understand how to complete their tasks.

(Nielsen, 1994, edited by Vilhelm Lindholm)

2.5 Combining the theories into one approach

When considering all the above-mentioned theories, we can construct a comprehensive theoretical framework that can guide design decisions for the CST model.

As PL demands connecting the learning experience to the community of the learner, the CST model must encompass studies at a higher point in the curriculum hierarchy than many other digital learning solutions. The model needs to offer a digital solution encompassing communication studies as a whole, including spatial, temporal and technological considerations.

As a machine model with procedural affordances, the CST can keep track of a wide variety of asynchronous multisequential interactions between students, teachers, and the system. The design of interactions needs to consider that communication skill development takes place in a complex and dynamic system, which would be difficult to accommodate with a one-size-fits-all curriculum approach. Acknowledgement of the complexity of the learning environment can be achieved by removing focus on language learning in a vacuum (i.e., isolated course activities) and creating synergies between languages, as well as course activities in substance courses. By tearing down the walls of communication studies, we can achieve benefits of PL, through increasing the meaningfulness of tasks by showing the synergy between a particular language and communication in general, as well as highlight the communicative aspects of tasks completed in substance courses.

A multisequential approach plays well into the need for autonomy from the SDT, while a comprehensive framework for what needs to be done responds to the need for relatedness. The combination of clearly articulated end goals and the freedom for choosing how to reach them can be supported by the CST model's participatory affordances and the companion model of interaction. The system itself should provide the external affordances for language development, as presented by Larsen-Freeman. This also follows the ideals of PL.

The participatory affordances, clearly presented through application of Nielsen's heuristics in the CST's design, should also help users perceive the external affordances, as well as experience agency when using them, which caters to the internal order of affordances.

In the following chapter, I describe the concepts and designs with which I attempt to implement the theoretical approach described above.

3 Description of the model

In this chapter, I present the design model created for the CST as well as the pedagogical concept and the learning environment in which the CST would be deployed. As this study focuses on reactions to a learning concept as experienced through the use of the design model itself, the pedagogical concept is only presented insofar it is relevant to understanding the function and role of the CST in its proposed learning environment.

At the time of writing, I have not come across earlier or parallel work of a similar nature, and a section considering such work is therefore omitted. That said, in Section 6.4.2, I compare the CST to the most commonly used platforms at the University of Turku: Ville and Moodle.

3.1 Concept and learning environment

The design model of the CST developed for this study was designed to be used in the context of a bachelor's degree program in Computer Science at the University of Turku. At the time of design, students in this program were required to take a number of obligatory courses in Finnish, Swedish and English. Although there were certain ways to be exempt from one or many of these courses, the general way to complete these required language studies was through contact teaching lessons, where attendance was mandatory. Even during the COVID-19 pandemic of 2020–2021, when most university teaching was done remotely, the courses were often taught synchronously, with obligatory attendance (Study Guide 2020–2022).

In the traditional system, to receive credits, a student would need to complete all the requirements for a course. In a typical case, this would mean meeting the attendance requirement and doing all required tasks within their appointed time frame. Missing any of the required components could mean not receiving any credit at all.

In the proposed pedagogical concept upon which the CST design is based, the language course framework would be dismantled, and progress would be tracked with much smaller granularity. Instead of only keeping track of completed courses, the CST would track and assign progress for each completed assignment that fit a Task Type on any available Track.

A *Task Type* refers to a type of communicative activity that trains specific skills, according to set parameters. For example, a Task Type could be giving a presentation to a live audience, writing a summary, or taking part in a team-building activity. Unlike a traditional language course exercise, which often specifies a certain task that all students must complete in the same way, a student using the CST could submit any assignment that meets a Task Type's criteria for credit. If a student had to give a presentation in a course about user interface design, for instance, they could submit a recording of that presentation via the CST and receive progress on the relevant Tracks. There could also be a Task Type for presentation preparation, where a student would practice structuring their content, or even a Task Type for choosing the topic for a presentation.

Tracks in the CST refer to the different areas in which progress is measured. In the design-model used in this study, there are four tracks: The Main Track, and one Track for each of the included languages, Finnish, English and Swedish. A single accepted assignment may advance more than one Track.

The Main Track consists of sets of communicative Task Types that practice all the focus areas a student is supposed to develop during their communicative studies as part of the degree program. Within the Main Track, there are subtracks of Oral, Writing, Reading, Teamwork and Bachelor's thesis. To advance these subtracks, a student needs complete and submit assignments that correspond to the Task Type parameters within the subtracks. On the Main Track, it does not matter which language a student uses to complete assignments. The key requirement is that certain communicative skills are practiced. For example, a student could be interviewed after reading an article written in Swedish, and receive Reading credit on the Main Track, and then later write an essay in Finnish for Writing credit.

Each Language Track functions in a similar manner. These Tracks consist of sets of Task Types that are based on the different language requirements set for students for each language. Naturally, to advance the Language Tracks, assignments need to be completed in the correct target language to progress a certain Track. To use the examples from the previous paragraph, the interview about an article in Swedish, would advance a portion of the Swedish Reading Track, as well as the Main Track. Similarly, writing the essay in Finnish would advance the student's Finnish Writing Track, in addition to the Main Track.

The CST administrators could stipulate restrictions and requirements regarding the exact parameters, sequencing, and availability of the Task Types in each Track. In the design model, the Task Types within each of the subtracks of the Main Track must be completed in a certain sequence, whereas the Task Types in the Language Tracks could be done in any order. In practice, this means that a presentation assignment may only progress a Language Track, but not the Main Track, unless that Task Type is next in line. Also, once a Task Type requirement is satisfied, submitting another assignment of the same Task Type no longer progresses the track.

The process for how an assignment progresses through the CST system is as follows:

- 1) A student submits a task via the CST, indicating both the Task Type and the language of the submission. Only Task Types that can currently advance at least one Track are available for selection.
- 2) A teacher (of the language of the task in question) assesses the submission and either
 - a) rejects the submission on the grounds of it not fitting the parameters of the Task Type,
 - b) asks the student to revise the assignment, or
 - c) accepts the assignment.

3) Once the assignment is accepted, the CST system checks if the Task Type in question is available

a) on the Main Track and/or

b) on the Language Track of the language of the task.

4) Progress is indicated accordingly.

Alternatively, a teacher can directly add a submission into the system, in which case the process would start at step 3. This might happen if a Task Type is completed after an interview with the teacher, or during a workshop where the student does not end up with an artefact to submit.

With the CST system in use, there would be no traditional language lessons at all. Instead, these could be replaced by weekly workshops, where students could come to practice and work on assignments if they feel they need help from teachers or peers. During these workshops, a student could work on any assignment and have a chance to receive support from teachers or peers.

3.2 Design model

For the purposes of studying the concept and design of a communication studies tracker, two design models were created using the design tool Figma. The designs were created for the two main user groups, the students and the teachers. Each design featured a mostly functional front-end for the system, where interactors could navigate the site, as well as use the most common features. The design model then represented certain predetermined outcomes visually, so that the testers could get an idea of the user experience. The usability test is presented in more detail in Chapter 4.

3.2.1 Common design features

Both the student and the teacher client of CST feature some common design elements. The left hand of the screen is reserved for the main navigation menu, where wide buttons for each of the clients' main views are arranged vertically. The dark background color of this segment clearly separates it from the content of the view, which is featured immediately to the right of the menu.

The top part of the screen is reserved for external links to other relevant university services. This area was left blank and white, as a placeholder in the design models. The university name and logo are clearly featured in the top left corner, while a placeholder for the service name can be seen in the top right corner of the design model.

The color scheme used is based on the color scheme of the University of Turku, featuring white, purple, and black as the main color components.

Welcome to the demo of Communication Studies Tracker (extended version)!

(**Setting this system up could be done during initiation week, either with tutors or the study councillor (OPO)**)
 You will soon be able to start tracking your communication studies with the Communication Studies Tracker. This system will show you what you need to do to complete your degree requirements, let you submit tasks to be reviewed by language teachers, as well as show you any feedback you receive from the teachers.

You will begin by answering a few questions that will help teachers provide better support for you and place you in a suitable team. After this, you will be taken to the Overview screen, which provides an easy way for you to see your latest progress. In the Planner screen, which can be reached by clicking the "Planner" section on the side bar, you can then more specifically look through the various task types available, and reach the resources related to them.

(This extended version of the Tracker also features some extra services that may overlap with other university service channels, and are mainly included as an indicator of the possibilities of this kind of platform.)

Once your questionnaire answers are processed, you will be able to access the "Teamwork" and "Your teachers" screens. On the former, you can see the names of your team members, and, depending on their settings, follow their progress and write peer reviews on their task submissions. On the latter, you can see who is on your teacher team.

There is a lot to take in, so feel free to peruse the system. We recommend that you take part in the weekly communication workshops, where you will not only get support with any communication task you are working on, but can also get help with the use of this system.

The Main Track task types need to be completed in a certain order. Aside from that, you are free to set the pace of your studies, as well as choose exactly how to complete each required task type. You can find suggestions and examples via the Language Resources screen, or choose tasks that fit your own interests.

The teachers on your team, your tutors and guidance staff are happy to answer any questions you may have.

Good luck on your communicative journey!

(** a specific tutor session could be arranged to make sure that students get at least one task uploaded through the system, and provide a chance to clear up any confusion **)

CONTINUE


Figure 3.1 Welcome screen

3.2.2 Student model welcome screen

The first view a student user sees in the design model is the welcome screen (see Figure 3.1). In this view, there are not yet any buttons on the left-hand menu, but the thick purple ribbon is already present in order to present the user with a consistent layout. A text-field at the top of the ribbon indicates that this page is the first out of two pages forming the introduction to the CST.

The content and form of the welcome screen was designed to give the testers an idea of how a new user would be welcomed to the service. It gives an overview of what the user will see next and encourages them to familiarize themselves with the system. The text within parenthesis is meant to give further context to the testers and would not feature on the production version of the design.

Once the user is done reading the welcome message, they can proceed to the next screen by clicking the continue button in the bottom right corner.



Links to external services

ComStud Tracker

ComStud introduction (2/2)

Self-assessment form

Please fill in this self-assessment form. The answers will be visible to your teachers, and assist them in placing you in your initial team. You can decide whether these answers will be visible to your teammates (default is off). You will be able to change your answers later.

How would you assess your general skill in Finnish?

Excellent
 Good
 OK
 Poor
 No comment

How would you assess your general skill in English?

Excellent
 Good
 OK
 Poor
 No comment

How would you assess your general skill in Swedish?

Excellent
 Good
 OK
 Poor
 No comment

How do you feel about oral presentations before an audience?

They are fun
 Nothing special
 They're difficult
 Presentations give me anxiety
 No comment

How quickly do you think you will complete your communication studies?

Fast pace
 Medium pace
 Slow pace

Are you interested in mentoring other students?

Yes
 No
 No comment

Do you have any conditions that may affect your studies ?

feedback

Are there any students you would like to be in the same team with?

feedback

Figure 3.2 Initial survey. The submit button is not visible in this image but can be reached by scrolling down on the page.

3.2.3 Self-assessment form

The second page of the introduction suite to the CST features an initial self-assessment form (see Figure 3.2). The design model features a suggestion for the types of things that could be asked, including self-assessment of language skills, a question regarding anxiety with oral presentations, expected rate of study, etc.

The answers to these questions are accessible to teachers (See section 3.2.17) and can be adjusted by the student later. This information could be used to place students into suitable groups, for example.

The multiple-choice answers are indicated by toggle buttons, while the open-ended questions collect the answers through input form fields. In the design, the page is fully static, and only serves as a visual example of what the initial survey could look like.

The user can proceed by clicking the submit button in the lower right corner.

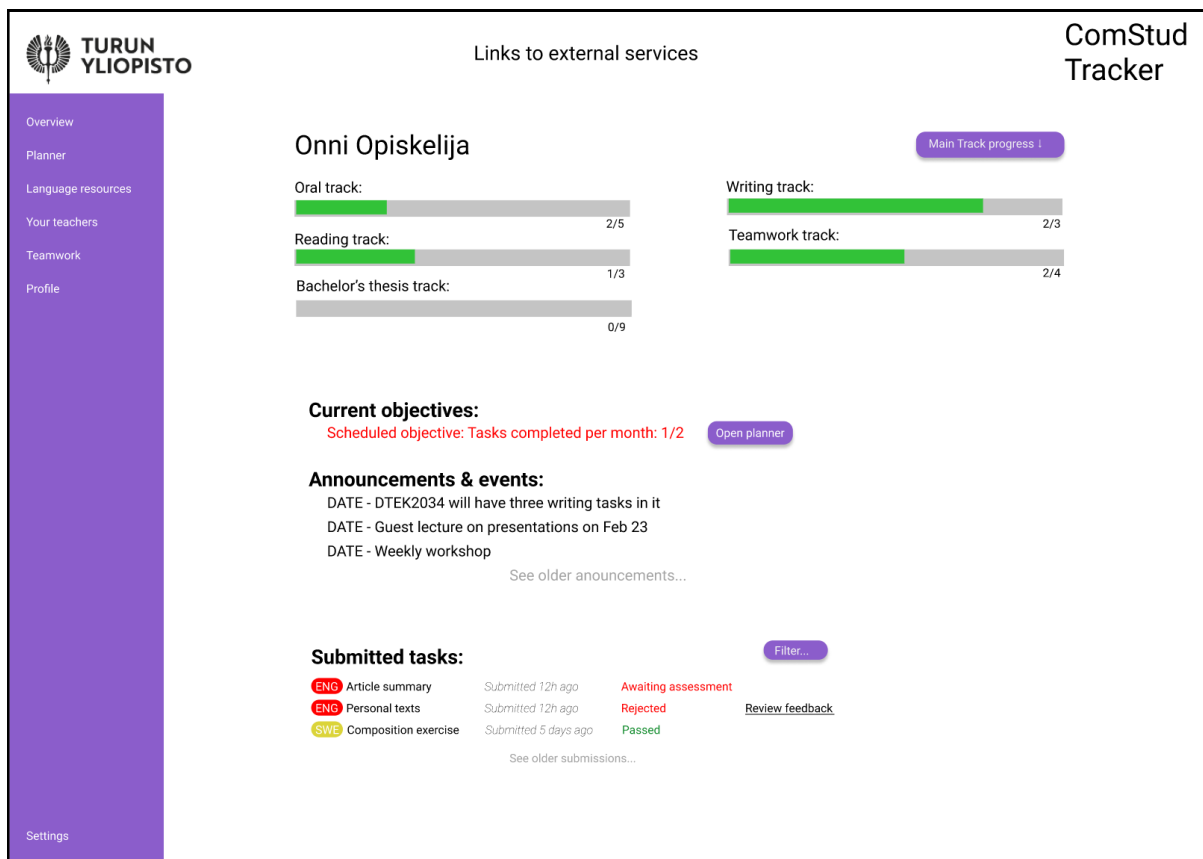


Figure 3.3 Overview

3.2.4 Student's overview

The Overview page is the default landing page for students (see Figure 3.3). The aim is to provide all essential information at a glance. The left-hand menu is now populated with the navigation buttons through which the student can access all the main views of the system.

The top part of the page consists of the progress indicator. This segment of the page shows the name of the student, as well as the student's communication studies progress, visualized with progress bars representing different subtracks. A button with a dropdown menu allowing the user to switch between progress views is found in the top right corner of the segment. Each subtrack is named and indicates progress both with a progress bar and a numeric indicator.

The default progress view shows the Main Track progress. There are five subtracks in this view: Oral, Writing, Reading, Teamwork and Bachelor's thesis. In addition to the Main Track view, the user can select All Languages, Finnish, Swedish or English. The All Languages view shows how much progress the user has made in each required language, without separating the individual subtracks. For each of the individual language views, the user can see their progress in the required task types of that language, separated into the individual focus areas of Oral, Reading and Written.

The middle segment of the Overview page features information regarding what objectives the student has set for themselves, as well as a listing of announcements and upcoming

events. The current objective is displayed in red if the objective is not yet reached. Next to the objective, there is a button that takes the user to the Planner page, which is where the objective is set. The announcements and event listings are static in the design model, and only visualize what kinds of events and announcement might exist.

The bottom segment of the Overview page shows the last three tasks that the student has submitted through the system. There is also a filter button with which the student can set criteria for which tasks to show, but it is not enabled in the design model.

Each submission first shows which language it was submitted for with a small icon. Next, the Task Type is listed, followed by how long ago the task was submitted. After this, there is a status indicator. In the design model, three different statuses are showcased: Awaiting assessment, Rejected and Accepted. The first two are shown in red, and the last one in green. If an assignment received feedback, this is indicated by a “Review feedback” message at the end of the listing. Clicking this message opens a pop-up window with more information. In the design model, this feature is only enabled on the Planner page (see Section 3.2.5).

The screenshot displays the 'Onni Opiskelija's planner' interface. At the top left is the Turun Yliopisto logo. The top right corner shows 'Links to external services' and 'ComStud Tracker'. A purple sidebar on the left contains navigation links: Overview, Planner, Language resources, Your teachers, Teamwork, Profile, and Settings. The main content area is titled 'Onni Opiskelija's planner' and contains several sections:

- Report inactivity:** Shows 'Student active.' with a 'Report inactivity' button.
- Current objective(s):** Shows 'Scheduled objective: Tasks completed per month: 1/2' with a 'Set objective' button.
- Submit a task:** Includes a 'Select task type' dropdown, a 'Select language' dropdown, a file upload area ('Browse computer or drag and drop file...'), and a 'SUBMIT' button.
- Submitted tasks:** Lists tasks with language icons (ENG, SWE), titles, submission times, and status indicators. One task is 'Awaiting assessment', another is 'Rejected' with a 'Review feedback' link, and another is 'Passed'. A 'Filter...' button is present.
- Browse task types:** Shows a tree view of task types: Oral (Main track: Presentation, 1st Reflection, Preparation, Live presentation, 2nd Reflection; Auxiliary: Topic selection) with a 'Filter...' button.

Figure 3.4 Planner

3.2.5 Planner

The Planner page is designed to let the student take actions to plan and progress in their studies (see Figure 3.4). These actions include reporting planned periods of inactivity,

setting personal objectives, submitting and reviewing submitted tasks, and reviewing Task Type requirements.

The image shows a user interface titled "Onni Opiskelija's planner". It features a form for reporting inactivity. On the left, there is a dropdown menu with a calendar icon and the text "Duration". To its right is a text input field with the placeholder text "Reason for inactivity". On the far right, there are two buttons: a grey "SUBMIT" button and a purple "CANCEL" button.

Figure 3.5 Interface for reporting inactivity

At the top of the page, the student can announce a planned period of inactivity by pressing the "Report inactivity" button (see Figure 3.4). This transforms the segment to a form, with which the student can set the duration of the inactivity, as well as indicate the reason for it (see Figure 3.5). This information will be visible to the teachers, and it will also turn off inactivity warning notifications for both the student and their teachers for the duration of the reported period.

Below the segment for reporting inactivity, the student can set their current objective. In the design model, this feature is not enabled, but a static structure shows how a student could set the number of tasks they want to try to complete during a certain time period (e.g., two tasks per month).

Submit a task:

The image shows a task submission interface. It starts with the heading "Submit a task:". Below this are two dropdown menus: "Select task type" and "Select language". The "Select task type" dropdown is open, showing three options: "Academic Text", "Peer review", and "Ac.text + sources". To the right of these dropdowns is a file upload form with the placeholder text "Browse computer or drag and drop file...". Below the file upload form is a purple "Filter..." button. On the far right, there is a grey "SUBMIT" button.

Figure 3.6 Task submission interface

The arguably most important feature of the CST is centrally located on the Planner page. The interface for submitting tasks via the system features two dropdown menus, a file uploading form field and a Submit button (see Figure 3.6). The first dropdown menu is used to select which Task Type is being submitted, the second specifies the language. The user can then drag and drop a file into the file upload form or click the form to browse their computer for a file to upload. The Submit button only becomes enabled once a task type, language, and file have been set. If the system detects that the file size of the submission exceeds platform limitations, an error message is displayed in red immediately above the form. The message explains that the file is too large, and directs the student to use the Funet Filesender service, which is available for university students, and can be used to transmit very large files. The error message contains a clickable link to said service. Although not currently implemented in the design model, the CST could also detect if the student would be trying to submit an assignment that would not currently advance any Track, and would provide a suitable warning.

Personal Texts task X

File submission:

[lettertosanta.pdf](#)

Status: **Rejected**

Feedback:

A list of things you want for Christmas does not quite fit the bill for a task in this category. Check the requirements in the task type index, or look at the moodle areas on writing for more information, examples and suggestions for qualifying tasks.

Graded by: Missy British Graded on: November 30

No feedback file attached.

Figure 3.7 Task feedback pop-up

Below the task submission interface, there is a segment showing tasks that the student has previously submitted. This segment is identical to the one on the Overview page, with the exception that the feedback review function is enabled on the Planner page in the design model. Clicking the “Review Feedback” message opens a pop-up window with feedback (see Figure 3.7).

The feedback window first displays the Task Type in question, and displays the submitted file, if available. Next, the status of the submission is shown, which could be Accepted, Revise or Rejected. Depending on the nature of the task, there may be a short textual feedback message and/or a feedback file. The window also indicates who graded the task and when it was graded.

The bottom part of the Overview page contains a collapsing menu of Task Type descriptions. In the design model, the view is static, but the hierarchy of the planned menu is displayed. The top level in the menu hierarchy consists of the main communicative focus areas: Oral, Reading, Writing, Teamwork and Bachelor’s thesis. For Oral, Reading and Writing, the next level divides Task Types into Main Track or Auxiliary Task Types, while Teamwork and Bachelor’s thesis would immediately display their Task Types when clicked. The lowest level of the hierarchy opens up descriptions of individual Task Type requirements. There is also a button titled “Resources”, which would link to supporting material for that particular Task Type. These resources would be hosted outside of the CST.

Since Main Track Task Types should be completed in order, there is a progress indicator built into the collapsing menu. Completed Task Type headers are marked with a checkmark and slightly greyed out, while the Task Type which is next in line is indicated in bold.

3.2.6 Language Resources

The Language Resources pages is simply a static placeholder in the design model (see Figure 3.8). On this page, teachers can add links to supporting material students can use when completing tasks. This material could include default tasks and exercises for students who feel unsure about what to do in order to complete Task Types.

3.2.7 Your teachers

The Your teachers page shows the student which teachers are currently assigned to monitor their progress (see Figure 3.9). There is also an opportunity for the student to quickly report to their teachers how they feel about their studies in a particular language at the moment.


The teacher team is introduced on the top half of the page. In the design model, the teacher team consists of one teacher per required language. The teachers are presented through a photograph,¹ name, taught language, and email address. Further, if a teacher has indicated their attendance in the next weekly workshop, this information is also displayed underneath the teacher's email address. If a teacher will attend, this is displayed with green text, while red is used to indicate that the teacher will not be attending the next workshop.

Beneath the teacher information, the quick feedback interface can be found. For each language there is a dropdown menu from which a student can select a response that describes how they feel their studies in that language are progressing. In the design model, the options are "Great", "OK" and "Need help". Selecting or changing a response here would send an immediate notification to the relevant teacher (see Section 3.2.12).

Below the quick feedback segment, there is a listing of upcoming workshops. This segment is similar to the announcements and events section on the Overview and Planning pages, except that it only shows upcoming workshops. In the case of additionally scheduled themed workshops that have attendance limitations, the list also features a registration button. This button is static in the design model.

At the bottom of the page, there is a "Report Inactivity" segment, which is identical to the one on the Planner page. It is included on this page as well for the sake of redundancy, and because students may feel they should report their inactivity to their teachers.

¹ The photographs used in the design model were artificially generated and taken from Generated Photos. <https://generated.photos/>


Links to external services
ComStud Tracker

Overview

Planner

Language resources

Your teachers

Teamwork

Profile

Settings

Language resources Filter...

Finnish:

links to material, moodle areas, etc.


English:

links to material, moodle areas, etc.

Swedish:

links to material, moodle areas, etc.

Figure 3.8 Language Resources


Links to external services
ComStud Tracker

Overview

Planner

Language resources


Your teachers

Teamwork

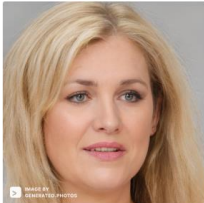
Profile

Settings


Onni Opiskelija's teacher team



Suomi Neito
Finnish
suomi.neito@utu.fi
Will be at next workshop



Missy British
English
missy.british@utu.fi



Sven Svensson
Swedish
sven.svensson@utu.fi
Will miss next workshop

Quick feedback: How are your studies going?

Finnish

English

Swedish

Upcoming workshops

DATE - Weekly workshops

DATE - Extra pronunciation workshop (4/20) Attend

DATE - Weekly workshop

Report inactivity:
Student active. Report inactivity

Figure 3.9 Your teachers

TURUN YLIOPISTO

Links to external services

ComStud Tracker

Our Team Great!
Onni Opiskelijä's team

[Edit team name](#)

Team Members:

Name:	Last logged in:	Objectives:	Submissions:	Status:
Outolintu, Outi	November 23	Tasks completed per month: 0/1	7	Active
Pekkanen, Pekka	<i>not shown</i>	<i>not shown</i>	<i>not shown</i>	<i>not shown</i>
Opiskelija, Orvokki	November 30	Tasks completed per term: 9/14	14 (2 new)	Active
Oppipoika, Oiva	November 23	Objective missed	7	Active
Privat, Petr	<i>not shown</i>	<i>not shown</i>	<i>not shown</i>	<i>not shown</i>
Ohaio, Gosha	November 30	Tasks completed per month 2/1	2 (1 new)	Reported inactivity => Dec 31: Work

[Privacy settings](#)

Settings

Figure 3.10 Teamwork

3.2.8 Teamwork

The Teamwork page featured in the design model shows a rudimentary vision of a teamwork interface in the CST (see Figure 3.10). In the design model, the functionality of this page is limited to the ability to provide peer feedback and reviewing general information about the team members.

The top of the page shows the student's team's name. An adjacent button can be used to change the team name. There is a reminder text under the team name, to make sure the user knows to what the name refers, in case it is changed to something obscure.

The middle of the page features a table with information on current team members. The table lists team members' names, last login times, objectives, number of submissions and current status, unless the student in question has declined to share some of that information. Missed objectives are listed in red and achieved objectives in white. If a team member has recently submitted tasks, this is indicated with a "(x new)" message after the total number of submissions in the "Submissions" column.

Viewing submissions of Orvokki Opiskelija

Task type:	Submitted:	File:	Peer review:	
Article summary	November 23	summary Orvokki Opiskelija.pdf	<input type="text" value="feedback"/>	<input type="button" value="Save"/>
Presentation	November 23	MOV_12343.mp4	<input type="text" value="feedback"/>	<input type="button" value="Save"/>
Pronunciation	November 17	pronunciation.wma	<input type="text" value="feedback"/>	<input type="button" value="Save"/>
Composition exercise	October 1	exerciseFIXED.docx	<input type="text" value="feedback"/>	<input type="button" value="Save"/>
Composition exercise	September 23	exercise.docx	<input type="text" value="feedback"/>	<input type="button" value="Save"/>

Figure 3.11 Peer review interface

The student can give peer feedback to teammates by clicking the entry of a student in the “Submissions” column. This opens a new view showing the submissions of that student (see Figure 3.11). Each submission shows the Task Type and submission date, and provides a link to download the submitted file for review. There is a text input form where the student can write the peer review. Once some text is entered into the form, the “Save” button becomes enabled.

Below and to the right of the table of team members, there is a button labeled “Privacy settings”. Clicking this button takes you to the Settings page (see Section 3.2.10). If you navigate to the Settings page via this button, an outline is briefly visible to indicate where the privacy settings related to team are located.

3.2.9 Profile

The Profile page is completely static in the design model (see Figure 3.12). The current design of the page mirrors that of the profile page used on the Moodle profile page, as configured in the Moodle platform used by the University of Turku.

3.2.10 Settings

The Settings page is also only a static page in the design model (see Figure 3.13). The three main areas in which settings can be adjusted are Overview, Planner and Notification settings. There is also a toggle button for a “Dark mode”.

In the Overview settings, the student can choose which view in the progress indicator should be opened by default. There is also a link for customizing the default view, but this feature is not implemented in the design model.

The Planner settings could also be named Privacy Settings, as they allow the student to determine what information they want to share with their teammates.

The Notification settings allow a student to toggle which events cause the CST to send them notifications.

The screenshot shows the user interface for a student's profile page. At the top left is the Turun Yliopisto logo. At the top center is the text "Links to external services". At the top right is the text "ComStud Tracker". On the left side, there is a vertical purple navigation menu with the following items: Overview, Planner, Language resources, Your teachers, Teamwork, Profile (which is highlighted), and Settings. The main content area is titled "Onni Opiskelija's profile page" and contains five sections: "User details" with links for "Edit profile" and "Email address: onnopi@utu.fi"; "Task submissions" with links for "Submitted tasks" and "Learning diary"; "Login activity" with "First login: September 09, 2001" and "Last login: November 23, 2020"; "Privacy and policies" with a link for "Policies and agreements"; and "Reports" with links for "Browser sessions" and "Activity reports".

Figure 3.12 Profile

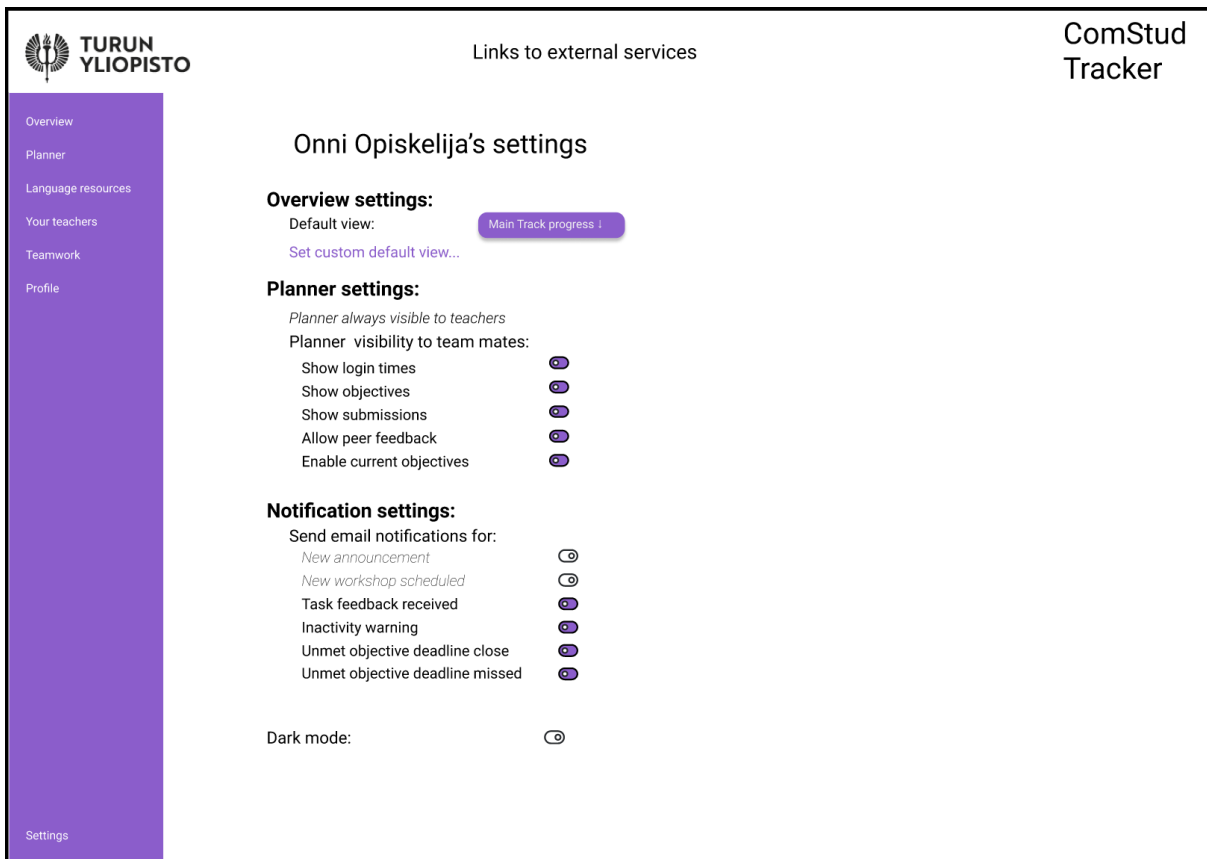


Figure 3.13 Settings

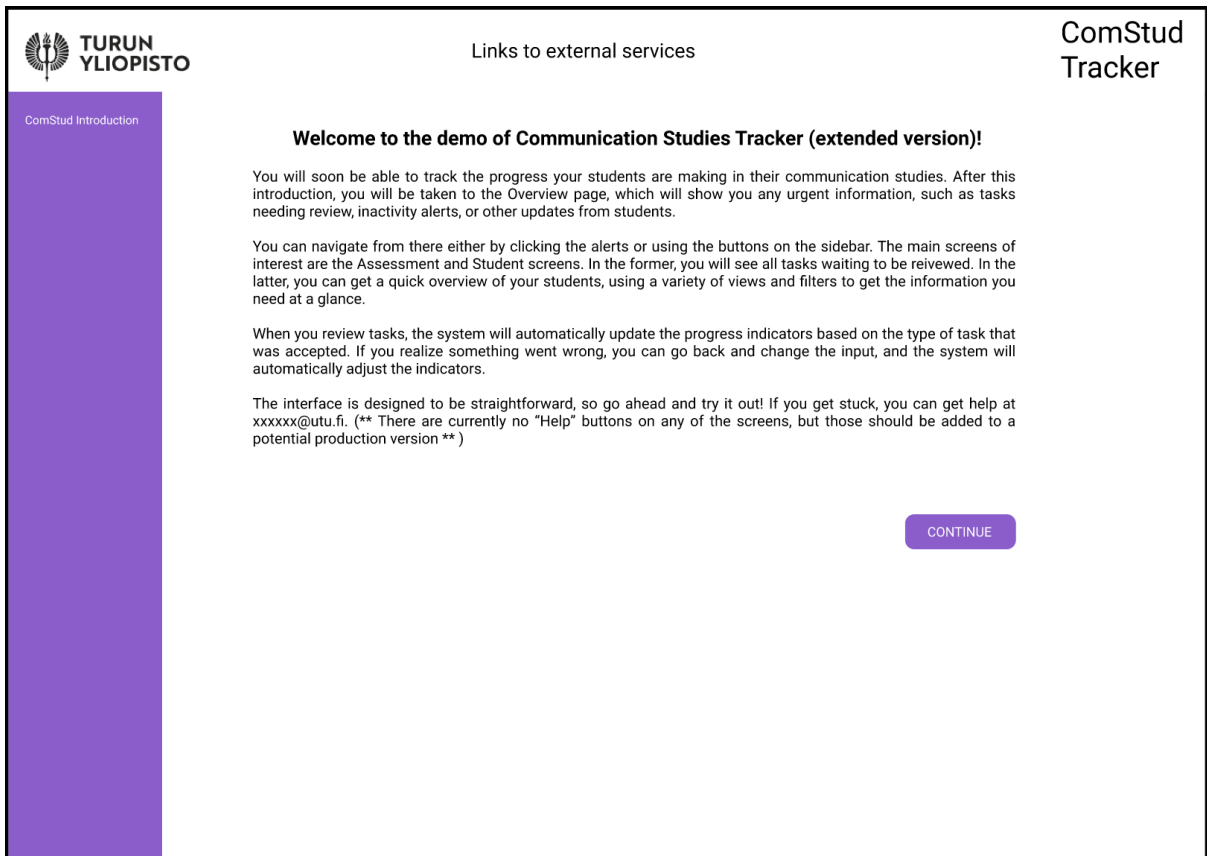


Figure 3.14 Teacher Welcome screen

3.2.11 Teacher model welcome screen

The welcome screen for a teacher taking the CST system into use is similar in design to the student's welcome screen, with the same purple ribbon on the left-hand side (see Figure 3.14). The main navigation buttons are not yet present on the welcome screen. The content on the welcome page is more concise than the corresponding text on the student model, mainly indicating how to navigate the site and mentioning how the backend of the system automatically adds progress to the right views after tasks are assessed. The welcome message ends with encouraging the user to try things out and giving information about who they can contact if they get stuck.

3.2.12 Teacher's overview

Similar to the Overview page for the students, the teacher's Overview page is the default landing screen after the first session (see Figure 3.15). Once again, the purpose of the screen is to provide a situation overview at a glance.

The top part of the page is reserved for notifications. Clicking on the notifications will take the teacher to the relevant view, where the cause of the notification can be seen. For example, clicking notifications about tasks awaiting review leads to the Assessment view (see Section 3.2.13), inactivity alerts lead to the Students page (see Section 3.2.16), sorted so that inactive students are shown first, and notifications related to specific students lead to individual student views, with the relevant mode selected (See section 3.2.17). Inactivity alerts are shown in red.

The middle segment of the screen is reserved for announcements. There is a button for making announcements (not enabled in the design model), followed by a list of recent announcements.


The bottom segment of the screen lists upcoming workshops and lectures. In addition to the list of events, there is also a design for an interface for teachers to indicate whether or not they will be attending the workshops. This interface consists of two buttons, a green button labeled "Attend" and a red button labeled "Do not attend". These buttons are not functional in the design model.

Figure 3.15 Teacher Overview

3.2.13 Assessment

The assessment screen is one of the most important screens for a teacher using the CST (see Figure 3.16). This page shows a list of all the tasks that have been submitted by students, but not yet assessed. An alternating coloring pattern is used to help distinguish the submissions. Each submission indicates the name of the student who sent it in, what Task Type it is, as well as when it was sent in. The submitted file can be accessed by clicking the file name, and needs to be opened by a suitable application, as the CST is not currently designed to include any integrated tools for viewing submitted media.

To assess a submission, the teacher reviews the submitted file, and can then assign a grade from the dropdown menu in the “Grade” column. The available grades are Accepted, Revise, Rejected. Further short feedback can be typed into the form field in the “Feedback” column. Finally, if more specific feedback is needed, a separate feedback file can be uploaded by clicking the “Upload feedback file” link in the “Feedback file” column.


Links to external services

ComStud Tracker

- Overview
- Assessment
- Tasks
- Language resources
- Students
- Workshops & Lectures
- Profile
- Settings

Assessment

Save changes
Undo

Name:	Task type:	Submitted:	File:	Grade:	Feedback:	Feedback file:
Opiskelija, Onni	Article summary	November 25	yhteenverto.docx	Grade... ▾	<input type="text" value="feedback"/>	Upload feedback file...
Opiskelija, Orvokki	Article summary	November 23	summary Orvokki Opiskelija.pdf	Grade... ▾	<input type="text" value="feedback"/>	Upload feedback file...
Opiskelija, Orvokki	Presentation	November 23	MOV_12343.mp4	Grade... ▾	<input type="text" value="feedback"/>	Upload feedback file...
Ohaio, Goshi	1st reflection	November 23	document.rtf	Grade... ▾	<input type="text" value="feedback"/>	Upload feedback file...
Tsetung, Mao	Documentation	November 23	modules.html	Grade... ▾	<input type="text" value="feedback"/>	Upload feedback file...
Jotakin, Jopas	Academic text	November 22	textFINAL(1).pdf	Grade... ▾	<input type="text" value="feedback"/>	Upload feedback file...

Figure 3.16 Assessment

Above the table of submissions, there is a button for saving changes. This button becomes enabled when at least one submission has received a grade, as well as feedback in the form of a message in the input form or a feedback file. Assessed submissions are then removed from the list. Next to the “Save changes” button, there is an “Undo” button, which will undo the last action taken by the user.

If a teacher wants to review already assessed submissions, that is currently possible via the individual student view (see section 3.2.17). You can reach a student’s individual view by clicking their name in the submissions table. There is also a link to all assessed submissions on the teacher’s Profiles page, but that link is not active in the design model.

3.2.14 Tasks

The Tasks screen is mostly identical to the “Browse Task Types” segment of the Planner screen on the student’s client, with the exception of an added section for Language Requirements, where a teacher can check which kinds of tasks are required for the different languages (see Figure 3.17). Like on the student’s client, the Tasks page on the teacher’s client is completely static in the design model, and only serves as a visual representation of how the menu would work.

TURUN YLIOPISTO

Links to external services

ComStud Tracker

Overview
Assessment
Tasks
Language resources
Students
Workshops & Lectures
Profile
Settings

Tasks

Oral ▾

Main track >

Auxiliary ▾

Topic selection ▾

Choosing a fitting topic for a presentation can be tricky. In this task, you should come up with a engaging topic for a presentation. You need to consider both your scope and your angle.

Resources...

Chaning text to presentation content >

Structuring a presentation >

Pronunciation >

Elocution >

Non-presentation speeches/talks >

Reading >

Writing >

Teamwork >

Bachelor's Thesis Track >

Language requiremens ▾

Finnish >

English ▾

Oral ▾

1 presentation + any 2 auxiliary tasks

Reading >


Writing >

Swedish >

Figure 3.17 Tasks

3.2.15 Language resources

The teacher's version of the Language resources page is almost identical to the student's, except for an "Edit" button by the language taught by the teacher using the client (see Figure 3.18). The button is not enabled in the design model, but the idea is that teachers would be able to add links to supporting content to the Language resources page, which then becomes visible to all other users.


Links to external services
ComStud Tracker

- Overview
- Assessment
- Tasks
- Language resources
- Students
- Workshops & Lectures
- Profile

Learning resources

Finnish:

links to material, moodle areas, etc.

English: Edit


links to material, moodle areas, etc.

Swedish:

links to material, moodle areas, etc.

Settings

Figure 3.18 Language resources


Links to external services
ComStud Tracker

- Overview
- Assessment
- Tasks
- Language resources
- Students
- Workshops & Lectures
- Profile

Missy British's students

Activity ↓
Filter

Name:	Tasks:	Last login:	Current objective:	Status:
Opiskelija, Onni	7 (1 new)	November 30	Tasks completed per month: 1/2	Active
Opiskelija, Orvokki	14 (2 new)	November 30	Tasks completed per term: 9/14	Active
Ohaio, Gosha	2 (1 new)	November 30	Tasks completed per month: 2/1	Reported inactivity => Dec 31: Work
Privat, Petr	7	October 23	Tasks completed per term 7/7	Idle (current objectives met)
Jotakin, Jopas	7 (1 new)	November 30	Objectives disabled	Active
Oppipoika, Oiva	7 (1 new)	November 23	Tasks completed per month: 1/2	Active
Pekkanen, Pekka	4	November 3	Objective missed	Inactive for 27 days
Otolintu, Outi	7	November 23	Tasks completed per month: 0/1	Active
N. N	7 (1 new)	November 30	Tasks completed per month: 1/2	Active
N. N	7 (1 new)	November 30	Tasks completed per month: 1/2	Active
N. N	7 (1 new)	November 30	Tasks completed per month: 1/2	Active
N. N	7 (1 new)	November 30	Tasks completed per month: 1/2	Active
N. N	7 (1 new)	November 30	Tasks completed per month: 1/2	Active

Settings

Figure 3.19 Students

3.2.16 Students

The Students page provides the teacher with an overview of all their current students (see Figure 3.19). The default (Activity) mode is very similar to the view of teammates on the student’s client (see Figure 3.10), except the same alternating color scheme used on the Assessment page is also used here. Further, the teacher can change the mode by choosing another view from the dropdown menu button to the right of the page title. The Activity mode is the default view, but Personal, Overall and the language taught by the teacher in question can also be selected (see Figure 3.20).

The Personal mode shows the students’ personal information, such as student number, starting year, email, and degree program. The overall mode shows the students’ progress in the Main Track focus areas (Oral, Written, Reading, etc.) as well as the overall progress in the various language requirements, using a simple numeric indicator (see Figure 3.20). The final option is whichever language the teacher teaches, and that mode shows progress within the language, broken down into the various subtracks.

There is a filter button on the page, but it is not enabled in the design model. Similarly, the columns could be sorted by clicking on a column header, but this is not implemented in the design model either. Like on the Assessment page, you can access a student’s individual view by clicking their name in the table.

Missy British’s students

Overall ↓
Activity
Personal
Overall
English

Name:	Status:	Oral:	Wri:	Read:	BT:	T	IN:	ENG:	SWE:
Opiskelija, Onni	Active	2/5	2/3	1/3	0/9	2/4	1/8	3/7	1/5
Opiskelija, Orvokki	Active	2/5	2/3	1/3	0/9	2/4	6/8	3/7	3/5
Ohaio, Gosha	Inactive => Dec 31	1/5	0/3	0/3	0/9	0/4	0/8	2/7	0/5
Privat, Petr	Idle	2/5	2/3	1/3	0/9	2/4	1/8	3/7	1/5
Jotakin, Jopas	Active	2/5	2/3	1/3	0/9	2/4	1/8	3/7	1/5
Oppipoika, Oiva	Active	2/5	2/3	1/3	0/9	2/4	1/8	3/7	1/5
Pekkanen, Pekka	Inactive	2/5	2/3	1/3	0/9	2/4	1/8	3/7	1/5
Outolintu, Outi	Active	2/5	2/3	1/3	0/9	2/4	1/8	3/7	1/5
N. N	Active	2/5	2/3	1/3	0/9	2/4	1/8	3/7	1/5
N. N	Active	2/5	2/3	1/3	0/9	2/4	1/8	3/7	1/5
N. N	Active	2/5	2/3	1/3	0/9	2/4	1/8	3/7	1/5
N. N	Active	2/5	2/3	1/3	0/9	2/4	1/8	3/7	1/5
N. N	Active	2/5	2/3	1/3	0/9	2/4	1/8	3/7	1/5

Figure 3.20 Student view, Overall mode

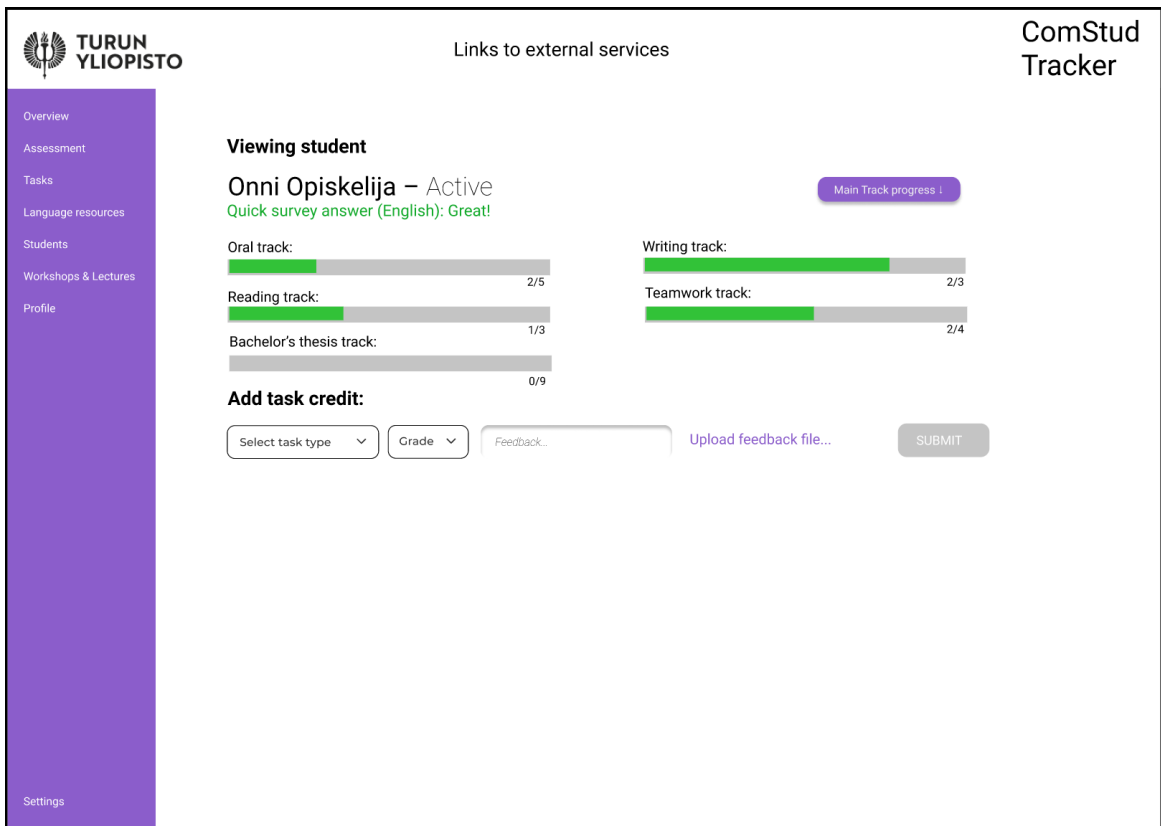


Figure 3.21 Individual student view

3.2.17 Individual student view

The individual student page is reached by clicking on a student’s name, either on the Assessment page or the Students page, or by clicking on an individualized notification in the notification list on the Overview page. It features a top segment, very similar to the progress view on the student client’s Overview page, as well as a segment for adding task credit (see Figure 3.21).

The default Main Track progress mode of the student view has a few key differences compared to the similar view on the student client’s Overview page. Firstly, if the student has answered the quick feedback survey (see Section 3.2.3), the answer to that survey is displayed under the student’s name. After the name, there is also an indicator of the student’s current status. The various other modes you can select from the dropdown menu button to the right of the student’s name are the same as on the student client’s Overview page, with the exception of the modes named “Task submissions” and “Self-assessment”.

Viewing student

Onni Opiskelija – Active
Quick survey answer (English): Great!

Task submissions ↓

Task type:	Submitted:	File:	Grade:	Feedback:	Feedback file:
Article summary	November 30	yhteenverto.docx	Grade... ▾	feedback	Upload feedback file...
Personal texts	November 30	lettertosanta.pdf	Rejected ▾	A list of things you want for Christmas	Upload feedback file...
Pronunciation	November 23	pronunciation.wma	Passed ▾	Thank you for the recording	Upload feedback file...
Grammar exercise	October 2		Passed ▾	feedback	Upload feedback file...
Composition exercise	October 1	exerciseOnniOpiskelijaFIXED.docx	Passed ▾	Thank you for the corrections	Upload feedback file...
Composition exercise	September 23	exerciseOnniOpiskelija.docx	Revise ▾	Thank you for the submission	exercisefeedback.docx

Figure 3.22 Individual student view, task submissions

The task submission mode shows all the tasks submitted by the student in the language taught by the viewing teacher (see Figure 3.22). It is identical to the view on the Assessment page, except there is no Name column since it would be redundant. Newly submitted tasks could be assessed from this view, in the same fashion as on the Assessment screen. Further, previous assessments can also be edited.

Viewing student

Onni Opiskelija – Active
Quick survey answer (English): Great!

Self assessment ↓

General Finnish skill:	OK	Oral presentations:	They're difficult
General English skill:	Good	Study pace:	Medium
General Swedish skill:	OK	Mentoring interest:	No
Conditions:		Comments:	

Figure 3.23 Individual student view, self-assessment

The self-assessment mode shows the teacher the answer to the student's self-assessment survey, which would have been initially answered when the student first started using the CST. If any answers have changed since the last time the teacher viewed this view, those entries would show up in purple (see Figure 3.23).

Add task credit:

Select task type ▾ Grade ▾ Feedback... [Upload feedback file...](#) **SUBMIT**

Oral:
Presentation
1st Reflection
Preparation
Live presentation
2nd Reflection
Topic selection

Figure 3.24 Individual student view, task credit assignment

The bottom segment of the Individual student view is used to add Task credit for tasks for which no file submission has been made through the system. This might happen if a student performs a task in view of the teacher in a workshop, or during a personal interview, or if the submission is sent in outside of the CST, by email, for example. The interface features dropdown menus for the Task Type and Grade, a form field for textual feedback, as well as a link through which a feedback file can be uploaded (see Figure 3.24). Once at least a Task Type, grade and some sort of feedback have been assigned, the submit button becomes enabled. Once task credit is submitted, the relevant progress bar in the top segment of the screen immediately updates to show that progress has been made in the relevant area.

TURUN YLIOPISTO Links to external services ComStud Tracker

Workshops & Lectures

Schedule workshops or lectures

 SCHEDULE

Upcoming workshops and lectures

DATE - Weekly workshops	Attend	Do not attend
DATE - Extra pronunciation workshop (Sven Svensson)	Attend	Do not attend
DATE - Weekly workshop	Attend	Do not attend

Figure 3.25 Workshops & Lectures page

3.2.18 Workshops & Lectures

The main purpose of the separate Workshops & Lectures page is to provide the teacher with an interface for adding additional workshops and lectures to the CST schedule (see Figure 3.25). The bottom segment of the page is a copy of the Upcoming workshops sections from the overview page, but the top segment features a simple scheduler. The teacher first chooses the date from the first calendar menu, then provides the topic, location, and maximum attendance into the three form fields after the calendar button. Once this information is provided, the “Schedule” button becomes enabled. Clicking this button will immediately insert the new workshop into the list of upcoming workshops and lectures below.

3.2.19 Profile

The teacher profile page is almost identical to the design of the student profile page, with the exception that “Submitted tasks” is replaced with “Assessed task” and “Learning Diary” is replaced with “Journal” (see Figure 3.26). Like the student client version, the teacher profile page is completely static in the design model and serves only as a visualization of a possible profile page.

The screenshot displays the teacher profile page for Missy British. The page is titled "Missy British's profile page" and is part of the "ComStud Tracker" system. A purple sidebar on the left contains navigation links: Overview, Assessment, Tasks, Language resources, Students, Workshops & Lectures, Profile, and Settings. The main content area is organized into several sections:

- User details:** Includes a link to "Edit profile" and the email address "miprbr@utu.fi".
- Assessments:** Includes links to "Assessed tasks" and "Journal".
- Login activity:** Shows "First login: September 09, 2001" and "Last login: November 23, 2020".
- Privacy and policies:** Includes a link to "Policies and agreements".
- Reports:** Includes links to "Browser sessions" and "Activity reports".

The top right corner of the page displays "ComStud Tracker" and "Links to external services".

Figure 3.26 Teacher profile page

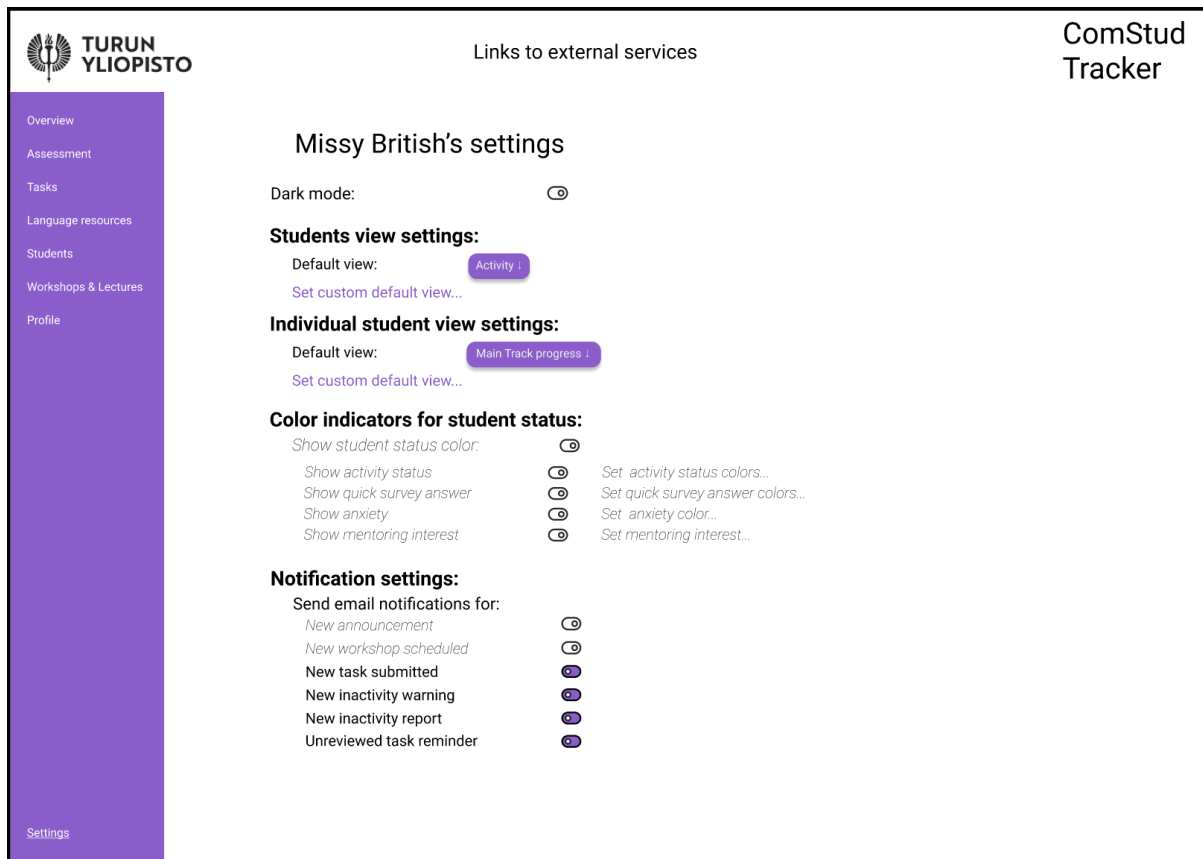


Figure 3.27 Teacher Settings page

3.2.20 Settings

The teacher client's Settings page mostly features similar settings to the one on the student client, regarding setting default views for the modal pages and determining which events in the CST systems should send notifications (see Figure 3.27). However, instead of the privacy settings found on the student version, there are a number of color indicator settings, which would allow the teacher to use color indicators for students, to quickly get more information about them at a glance. In the design model there are options to set color indicators for activity status, presentation anxiety or willingness to mentor others, for example.

4 Research method

In this chapter I present how the usability test that was used to collect the research data was structured and carried out. I also present how the testers were selected. Further, I describe the method for how the results were processed. The results are presented in the next chapter.

The general premise of the usability test was to have users from both target groups, teachers and students, test the design model for the CST. The test entailed the participants use the design model to complete a list of tasks presented as usage scenarios, followed by a semi-structured interview session. The tests were carried out in January and February 2021. In the following sections, each step is presented in detail.

The approach used in this study adopts the concept of co-design, as defined by Sanders and Stappers (2008) as well as Marc Steen (2013). Through the usability test and interviews, the participants were invited to take part in the design process, not only by contributing their knowledge and experience, but also by reflecting on their role in the context in which the CST would be used, and, especially for the teacher testers, considering how the idea behind the system might complement their own work.

4.1 Tester selection process

As this study is only an initial viability test of a design-model and a pedagogical concept, the number of testers in each target group could be kept fairly low; it has been shown that five testers will generally detect most usability issues in a given testing frame (Nielsen & Landauer, 1993).

Various methods were used to find testers among the two target groups. Regarding the students, an open invitation was sent out to Computer Science students currently studying at the University of Turku. Five students responded to the invitation, and since they represented a diverse spectrum of users, they were all chosen to participate. Among the students were a freshman, a foreign master's degree student, and an older working professional studying via the Open University.

The five teachers chosen were invited personally, since they are colleagues of the author of this study. Despite being colleagues, it is believed not a significant amount of bias impacted the study, since the chosen teachers worked in other departments from the author of this study. None of the teachers had had any part in designing the model or contributing to the concept and were only slightly familiar with the designer's teaching philosophy via occasional discussions during development days and similar functions.

4.2 Test structure

Since the usability tests took place during the 2020–2021 COVID-19 pandemic, the usability tests were carried out remotely via Zoom, a video conferencing tool that became a frequently used tool for distance meetings during the pandemic. With each participant, care was first taken to make sure the tester was able to access the design-model, share their

screen, and to make sure the audio and video worked properly. All five teacher testers and three out of five student testers also shared a webcam video feed showing their reactions as they tested the design. After the technical tests had been completed, the meetings were recorded using Zoom's internal recording function. The test sessions lasted roughly between 60 and 90 minutes.

The author of this study served as both facilitator of the test, as well as the observer. However, while the tests were ongoing, focus was on facilitating the test and conducting the interview, since the observing could be done afterwards by analyzing the recorded video.

The tests started with a brief introduction of the test (see Appendices A & D) informing the testers what they could expect from the test. Prior to this, all testers had only been told they were going to test a system that would track communication studies in a new way. The introduction also gave the testers a brief overview of the pedagogical context the CST would be used in, as well as some general features of Figma, which was the design tool used both to design and test the model. For instance, testers were told that interactive areas of the model would flash blue when the mouse button was clicked.

4.2.1 Technical issues experienced

Most tests were conducted with no technical difficulties. However, in the very first test, the tester was not able to set the design-model into full screen mode, meaning they had a harder time making out the elements on the page. One tester also experienced some problems with their microphone, making it occasionally difficult to make out what they were saying, both during the test and the analysis of the video. However, neither issue caused any critical problems to the viability of the tests or the results.

4.3 Test scenarios

After the introduction of the tests, testers of both groups were presented with nine test scenarios (See Appendices B & D). In order to get the testers to act like prospective users of the service, the scenarios were designed to set small goals for the testers to achieve within the system that mirrored common needs that real users of the CST would have (McCloskey, 2014). While completing the scenarios, the users were asked to "think aloud", as this is a good method for observers to be able to better understand their actions and motivations (Nielsen, 2012). The testers were also free to ask questions of the developer/facilitator or discuss ideas that came to mind as they were completing the scenarios.

In retrospect, the discussion should perhaps have been more restrained, especially from the side of the facilitator. Possibly due to also being the developer, the loquaciousness of the facilitator went against some guidelines for observation of usability tests, which advocate a much more restrained interaction with the testers (Farrell, 2016). Although the framework for the test session was that of a usability test, sometimes the nature of the discussion became more like a co-designing brainstorm session. Further, the facilitator's inexperience

with conducting usability tests can be seen in some unsolicited interventions during the testing.

4.4 Interview

Immediately after the test scenarios, there was a reserved time for free discussion, during which the testers could bring up anything that was on their mind regarding the testing experience. After this, the testers were asked a number of open-ended questions (see Appendices C & F). All participants were asked the same questions, but in some cases, some of the questions had already been partially answered in the discussions during the test. In other cases, a tester might start talking about something not directly answering the question, but they were allowed to speak their mind before being gently reminded of the original question.

The testers were also offered the chance to get the questions in writing, and provide more information and answers later, but none of the participants made use of that option.

4.5 Data processing method

Once all ten usability tests were completed, the recordings were analyzed by examining how each tester had handled each of the test scenarios, as well as noting the comments, questions, and discussions that took place both during the test and the interview. This data was then coded and sorted into categories, such as “Comments about Learning the System” or “Concerns Raised”. For a more detailed breakdown of the categories, see Appendix G. In Chapter 5, the specific results of the analysis are shown and discussed in more detail.

5 Results

In this chapter, I present the results of the usability tests and interviews described in Chapter 4. First, I present how the testers responded to the concept of the design, and second, their experiences with the actual design are presented.

The results regarding the concept are divided into positive comments and concerns, followed by an analysis of these. The positive comments and concerns are further divided into subcategories, following the structure outlined in the coding grid in Appendix G. The results related to the design of the CST model are first presented as an overview of how the testers managed with the usage scenarios. Next, specific issues that came up are presented, in accordance with the coding categories for the design section in Appendix G. As with the results regarding the concept, the design-related results are then analyzed.

When referring to the collected data, a reference identifies the tester (S/T 1–5, depending on if it was a student or a teacher) and the test scenario or interview question (sc/q 1–10). For example, a reference to the fourth interview question from the third teacher tester would read (T3, q4).

5.1 Positive comments regarding the concept of the CST

In general, the reception of the CST concept was positive with all ten testers. Seven out of ten testers exhibited clear visual and/or audial signs of excitement with regards to the concept, while three remained more level-headed throughout the interview. However, even those who kept a more neutral tone, expressed generally positive attitudes towards the underlying pedagogical concept.

5.1.1 Timing/flexibility

One feature of the concept that was positively mentioned by every tester was the flexibility offered by the CST model. Students especially appreciated the ability to select the timing of their tasks, mentioning how it can sometimes be difficult to both secure a spot in and meet the deadlines for current courses. Teachers also noticed that this approach would allow them to stop reminding students about deadlines and would help students develop responsibility for setting their own schedules.

One student tester expressed that the rigid structure of current courses would often clash with his professional and personal duties:

“Jos vaimo sanoo että vahti lasta, ja pomo sanoo että mene torille valvomaan järjestystä... sit mä en tee ruottii enkä englannin tehtäviä.” Translation: If my wife tells me to watch our child, and my boss tells me to get to the town square to maintain order... then I’m not doing Swedish or English exercises. (S1, q7)

A teacher tester strongly expressed that her experiences during the COVID pandemic made her feel she could not expect all students to come into a certain space at a certain time any longer, and that the CST tracker would facilitate asynchronous learning.

5.1.2 Adoption/implementation

Seven out of ten testers explicitly expressed positive notions about how the CST tracker could be taken into use at the University of Turku. They felt that the concept represented a logical development in the currently ongoing digitalization of services in society at large. There also seemed to be a general agreement that this kind of system would be able to work.

One student tester believed that a system like the CST is inevitable, while a teacher tester stated she felt the concept is exactly in line with the strategic plans of the university. Many of the teacher testers had had thoughts of trying to create courses with a similar approach, but it was felt that a centralized system like the CST would take the weight away from an individual teacher, making the prospect seem much more viable. One teacher also stated that the focus on learning analytics was not too heavy, saying that the amount of data provided for the teacher to process (i.e., task submissions, activity, survey answers) felt sufficient, approachable, and manageable.

5.1.3 Meaningfulness/relatedness

Seven out of ten testers expressed feelings that the CST would increase the feeling of meaningfulness of communication studies. The ability to submit tasks and projects for substance courses as communication Task Types made students feel like the tasks would be meaningful and relevant. Both students and teachers also liked how the initial survey in the system attempted to gauge learner skill levels, which would allow teachers to better direct their focus, as well as facilitate synergistic group creation. Teachers especially commented on how this system would allow them to better notice those students that needed help, instead of dividing their time equally over groups of students.

“Sitähän tää just siis auttaisi!” Translation: This is exactly what this [system] would help with! (T5, q8)

The flexibility mentioned earlier would also help with meaningfulness, since students would be free to choose ways to complete Task Types that feel meaningful to them. Further, the timing flexibility would allow groups of friends to do tasks together, if desired.

One student tester who had already completed her communication studies stated she could imagine herself doing tasks between substance lectures or during other downtime with her friends in the work areas of the university, which she found very appealing. A teacher tester also liked the thought that supporting material for the Task Types would be co-created by teachers of different languages, which could enhance cohesion of teacher teams. Teachers saw the concept as a means to create a closer connection to teachers of substance courses, as well.

5.1.4 Teacher role and automation

Four of five teacher testers commented that the concept of the CST shifted a teacher's work and role towards a more positive direction. The automation of the tracking was specifically

mentioned by two teachers as a possible solution to the increased administrative duties that have been a source of much consternation for teachers in the past decades.

One teacher tester grew particularly animated regarding the “secretarial duties” that are currently part of a teacher’s job description, and stated that the CST could ameliorate that problem. Other teachers pointed out that the CST concept would shift their role towards becoming more of a trainer or a coach than an authority figure, which they felt aligned well with how they would like to be perceived as teachers.

5.2 Concerns and reservations regarding the concept of the CST

Most of the concerns brought up by the testers were related to how implementation would work in practice, as they all felt the concept was good in theory. In most cases, the concerns were satisfied by the facilitator’s answers to the presented concerns, but the raised issues still bring out key points for focus and development of the system.

5.2.1 Weaker/unmotivated/disorganized students

Six out of ten testers mentioned concerns about support for students who are not inherently committed to the course, or do not have well-developed studying skills. Some student testers were concerned about how they would get support with challenging content, while teachers frequently brought up that student time management skills often leave much to be desired.

“This is good for students who are people who work by themselves, but if it is something more challenging, I will go to the class like a good boy.” (S3, q6)

The weekly workshops, which are designed to provide learners with peer and teacher support, raised some questions, and testers agreed that these could provide the needed support for challenging tasks. Since the CST design model does not include information on how these would work in practice, some concerns about the nature of these workshops remain.

5.2.2 Interaction/synergy with other systems/platforms

Half of the testers wondered where the CST would fit in the already quite wide range of systems and platforms already in use. There were some concerns about adding yet a new system to the load, as well as questions on how the CST would be different from the already available options.

She wonders how this system will track students differently from how she already tracks students on Moodle. She mentions that she can track students using the gradebook on Moodle, and she can see alerts. (T2, intro)

How the CST compares to Moodle, Vile, and Peppi is discussed in Chapter 6.

5.2.3 Group mechanics and coordination

Four of ten testers brought up having reservations on how groups would work in a system based on asynchronous activity. They felt there was a conflict between individual, autonomous work, and persistent groups.

“When everyone is doing things on their own thing, and a team task comes up in a track, how will it work if everyone is somewhere else in their studies?” (S3, sc8)

There was a clear recognition that group work is essential and its implementation can be challenging. One student stressed the need for coordination within the group, as without it, having groups would be pointless. There were also suggestions for creating opportunities for ad hoc group creation instead of having static groups. Some of these suggestions are revisited in Section 5.4.2, where design-related suggestions are considered.

5.2.4 Quality of Task Types

Four of ten testers brought up concerns about the nature and quality of the Task Types. Each tester brought up different aspects. The first, a student, had reservations about allowing personal texts, from places like internet forums, be considered communicative tasks worthy of university credit. Another student stressed that supporting material for Task Types must be well made and presented, in order to motivate students to use them.

“Jos sul on tääl language resourssit, sul on täsä sellainen roskaläjä, niin tuskin se innostaa tutkimaan...”
Translation: If you have your language resources here, you have here some kind of pile of trash, well I doubt it will encourage you to look into it. (S4, q8)

On the teacher side, a Swedish teacher was concerned that student skills may not be sufficient to take on “authentic” tasks in Swedish. Another teacher was concerned about how a multisequential environment could provide learning paths that ensure development of key skills.

5.2.5 Administration

Four of five teacher testers wondered how the CST concept would affect the allocation of their hours and time usage. There was concern about how teaching hours would be calculated, since there are currently very specific yearly plans for work hour allocation, which fits poorly with a more fluid and dynamic system as proposed by the CST.

She mentions that it is a question of hours and resources. Currently they have a set number of contact teaching in a course-based system. How would you move away from this? How would hours be tracked? She mentions that the hours in the written work plan are quite restrictive in this respect. (T1, q7)

The shift from set course timetables to a dynamic system of task reviews and workshops also raised questions about time usage. There were some concerns that the CST would require a large time investment, and it was sometimes difficult for the testers to stop thinking about time usage related to a set schedule of classes.

5.3 Analysis of the results regarding the concept of the CST

The results regarding the concept of the CST can be analyzed through the lens of Self-Determination Theory (SDT) and Personalized Learning (PL). SDT can be used to determine how well the proposed CST concept caters to the needs for challenge, relatedness, and autonomy. The PL point of view considers both the possibility for customization for an

individual learner, as well as implications for how the CST would fit into and be implemented in the larger context of the university as a learning environment.

The clear positive feedback on the aspect of flexibility is supported both by SDT and PL, as it was clear that the testers felt that the CST concept would allow students the autonomy to work at their own pace. This flexibility also linked very heavily with the feeling that the CST would help make communication studies feel more relevant and meaningful, which strongly correlates both with PL and the relatedness need from SDT.

An interesting find was that the intuitively perceived conflict between the need for autonomy and relatedness in SDT was mirrored in the results, as testers perceived a possible anti-synergy between autonomy and group work. However, as in SDT in general, autonomy and group activity can be complementary, when working properly. Creating the appropriate support structures for this will be a key design challenge.

Both the concerns about administrative realities and the general consensus that asynchronous approaches like the CST would facilitate are part of the future or university studies are supported by the findings of PL research, which stress that PL approaches require actions from a wide array of actors in the learning environment. The concerns expressed by teachers about allocation of hours, for example, indicate a realization that the implementation of a system like CST is largely out of the hands of individual teachers, and would require the collaboration between designers, developers, teachers and leadership. At the same time, the general feeling that the CST represents a viable solution, in step with the strategic vision of the university, seems to indicate that there is a readiness to take on structural change at the scale that is needed.

Although Murray's (2012) digital affordances and models of interaction are more directly related to concrete design decisions, which are featured in later sections of this chapter, the concept results already show the need for designs that rely on these concepts.

The appreciation for automation of menial tasks, which was apparent in the results, show support for the idea that already on a conceptual level, the CST aims to leverage the procedural affordances of a digital artefact. The CST here clearly presents itself as a machine model, in Murray's interaction models.

The concerns about support for time management raise the need for the CST to also function as a companion model, with support for timetable and activity management. Although these again are particular features of the design, the idea of this kind of support already exists on a conceptual level in the CST through the reimagining of the role of both teachers and the platform itself in the system.

The concerns about being able to learn if a student is not already skilled and committed directly relate to the ability to successfully meet the need for challenge from SDT. With regard to this, the more individual aspect of PL becomes helpful, as the CST allows learners to engage in Task Types at various levels of complexity, according to their own skill level,

need and interest. This ties in with the concerns raised that the Task Types themselves need to be sufficiently well-designed. Further, teachers will need to be able to convert from a linear sequence of Task Types, found in traditional course design, to the multisequential environment that is afforded by the CST. Meeting this challenge, as well as determining the exact nature of how workshops should function, is a key responsibility for teaching staff to develop within the affordances provided by the CST.

5.4 Design-related results

Overall, the test scenarios were completed quite easily by the testers, with 61% of all attempted scenarios being completed without any issues (see Table 1 and Table 2). Further, in 13% of attempted scenarios, the issues that were experienced were not related to the test scenario but noted during the completion. The test scenario that caused the most issues was Scenario 3 from the Teacher’s model. This result is probably partly explained by the fact that the scenario includes looking into what three separate alerts refer to, while the other scenarios had a single objective.

Still, as the purpose of early usability testing is to find issues, the fact that most test scenarios resulted in some perceived problems can be considered positive, as it facilitates the process of finding points of development. Four scenarios (Student sc1, Teacher sc 5, 7 and 9) were so straight-forward that no one had any issues with them. In two scenarios, the user simply had to check that their email was set correctly in the system, while the other two related to finding student requirements and scheduling a workshop.

Table 1. Student test scenario result summary.

Scenario:	S1	S2	S3	S4	S5
1	0	0	0	0	0
2	x	x	i	i	0
3	0	i	x	i	0
4	0	0	0	x	i
5	x	i	x	0	i
6	0	0	x	0	0
7	0	x	0	0	0
8	x	0	i	0	x
9	0	0	x	0	0

<p>Legend:</p> <p>0 = no issues</p> <p>x = issue with the scenario task</p> <p>i = other issue identified</p>

Table 2. Teacher test scenario result summary.

Scenario:	T1	T2	T3	T4	T5
1	0	i	0	0	x
2	x	0	0	0	0
3	x	i	x	i	x
4	x	x	x	0	0
5	0	x	0	0	0
6	0	x	0	0	0
7	0	0	0	0	0
8	0	x	i	0	x
9	0	0	0	0	0

<p>Legend:</p> <p>0 = no issues</p> <p>x = issue with the scenario task</p> <p>i = other issue identified</p>

5.4.1 User interface

In a preliminary test like this study, it is generally not helpful to focus on the minute details, such as exact placement or shape of a particular element on a page when it comes to the responses of the testers. However, if something is mentioned several times, it is a good indicator that it is an area that needs attention.

Interestingly, all five teacher testers explicitly expressed that they felt the design was easy, intuitive, and simple. One student mentioned that educational tools often require a lot of effort, even if you are not doing very much. Perhaps teachers, being used to more clunky tools, noticed the more efficient design, whereas students are more used to streamlined commercial apps, and were more likely to comment on a design being less efficient than expected.

It was clear from how all the testers navigated the model during the test that the general design with a left-hand menu was familiar. Although it was pointed out that the order of the buttons could be sequenced more logically, with more often used buttons at the top, and less relevant ones at the bottom, all testers used the left-hand menu easily and correctly.

Using dropdown menus to change modes in the different views caused some initial problems, when a few testers had difficulty identifying the dropdown button. They mentioned the size of the button, along with the text and the icon could be bigger. That said, once the first dropdown was identified in a view, it was easily recognized by testers later on during the test.

The progress bars received explicit praise from six of ten testers, and all testers were able to easily interpret the information they provided as they completed test scenarios. Many testers also commented that they would like more information when they hover or click on the bars, a feature that is planned, but not implemented in the design model.

In general, testers were able to identify key indicators in the model, such as status indicators of submissions or students, announcements, or upcoming workshops. However, there was

some concern that, in the current model, reported inactivity only shows when this period ends, not when it starts, which led to some ambiguous interpretations.

The overview screen in both the student and teacher models was appreciated, but both students and teachers commented that all information and services that are repeatedly used should be featured on it. For students, this meant being able to submit tasks, and for teachers, it would be a list of received tasks.

There were some split opinions about the listing of the Task Types. A few students felt the collapsing menu provided a working solution, whereas some felt it was messy, especially if multiple branches were open. One student also expressed a concern that the list of task types was too long when submitting a task.

When considering the data coded into the categories related to interpreting and learning the system (Appendix G, Design categories 3–6), it can be surmised that, although all testers made wrong guesses and missed some information at first, once they realized how something worked, it made sense to them, and was easily remembered the next time.

“This might sound like I’m making excuses, but normally I would have pressed that immediately.” She facepalms and explains that she may have been overthinking it in this situation (a usability test) because she said the red color immediately got her attention. (T5, sc1)

5.4.2 Feature comments and requests

As previously stated in the results regarding the concept, the testers all generally liked the core concept, to which it follows that they also appreciated the core functions of the CST, namely submitting/assessing tasks and monitoring progress.

In addition to the core features, several of the support features also received positive feedback. Teachers appreciated the notifications of submitted tasks, inactivity, quick survey answers, etc. One student mentioned that with commercial apps like Duolingo, the email reminders are a nuisance, but that similar ones in the CST would be quite helpful. The fact that these reminders would be turned off when students had reported being inactive was especially appreciated by teachers, with one teacher commenting it would save her dozens of email interactions.

On the topic of how to better manage groups, there was discussion about either imposing intermittent deadlines for group tasks or creating a kind of queue system for ad hoc group creation. A queuing system could draw inspiration from various multiplayer games, in which players join a queue for a particular kind of game mode, which then starts once a sufficient number of players are ready. Queues require a certain active population to work well, so this option might only be feasible if the CST system would be more widely used.

Several testers inquired whether the CST would include additional features, such as a calendar, chat/messaging, or ways to open student submissions within the model. Currently there are no such plans, as it is felt that existing solutions for these services function well

enough externally. That said, integration or compatibility with current systems, such as Peppi or Moodle, are discussed in Chapter 7.

Some teachers mentioned a need for support for students from different majors. The current CST design is modeled to suit the bachelor's degree program in Computer Science at the University of Turku, but most communication teachers teach students from multiple departments. This would require a way to switch between different department requirements, on one hand, and distinguishing between students of different departments, on the other.

5.4.3 Accessibility

Although the tested CST design is only the first iteration, it is already a good idea to keep accessibility in mind. Already at this stage, testers brought up concerns about cross-platform usage, language settings and use of color.

The tested CST design was made for use on a computer, but testers mentioned there being need for a mobile version, as well. One teacher asked about a companion app, through which she would be able to get notifications to show up on her phone.

Several testers mentioned language settings during the test. The tested model was only available in English, which was explicitly mentioned as a reason why some testers were not immediately able to recognize some elements. Naturally, the idea is that a production version of the model would have multiple available languages.

Finally, the use of problematic colors was brought up, as some warning texts appeared in red so that they would stand out. This could be problematic for users with color blindness and needs to be taken into consideration. In future iterations, the usage of colors in the model should more closely align to the university accessibility guidelines, which should resolve these issues. There were also suggestions of potentially using some kind of icons in addition to color as a possible solution.

5.5 Analysis of the design-related results

One way to assess the design-related results is to see how well they follow Nielsen's ten principles of good UI design (see Section 2.4). Each numbered paragraph below refers to an analysis of how the corresponding guideline was met.

1. Starting with visibility of system status, the positive feedback regarding the progress bars, status indicators and notifications appear to satisfy this principle quite well. To make the reported inactivity clearer, the indicator should clearly include when the inactivity started, and clearly distinguish the self-reported "absence" from the automatically detected inactivity.
2. With the exception that many testers were not native English speakers, the design used terms that were easily understood and interpreted by the users. Specific comments brought up good suggestions on how changing some menu names would

better suit the content, but in principle, this guideline was well-met. The targeted user groups found the terminology used well-suited to the task, and understood new concepts like Task Types quite well. Naturally, meeting this guideline fully would require localization into the users' target languages.

3. The more adventurous testers often navigated around the model in ways not dictated by the test scenarios. They relied on the left-hand menu to get them back when they got lost, which it did, except in the few cases where the design model did not include a fully functional left bar, due to the limitations of Figma.
4. While there were incidental issues where different terms were used for the same thing, the consistency in naming and using similar ways to change modes on views through dropdown menus helped the users quickly learn how things worked, even if they were initially confused. The similarity to things like Moodle when processing tasks, for example, helped testers quickly come to terms with key processes.
5. While the concept of error prevention had been kept in mind during the design process, Figma restrictions in the design model made it so that "incorrect" situations were prevented somewhat artificially.
6. As stated earlier, the main principle of navigation in the model was consistent in the different views. In the design model, tooltips were absent, but student names were already clickable to reach that student's individual view, for example.
7. While customization was hinted at on the settings page, no customization was currently available in the design model.
8. As no testers mentioned features in the design that they felt were unnecessary, the minimalist design goal appears to have been reached. Further, the teachers' comments about the clean and efficient interface seems to underline this point.
9. There was one singular error message featured in a test scenario, which informed users the submitted file was too big, and provided a link to a university file transfer service.
10. The design model does not include tooltips or help buttons, but most testers did not seem to need them.

Based on the above analysis, the UI of the CST seems to rest on a good foundation, even if it is still in an early form. This suggests that the affordances that the CST provides should be easily perceived by the various user groups, referring to the secondary order of affordances mentioned by Larsen-Freeman.

The appreciation of the CST's core functions and the included support functions suggests that testers found the artifact useful both as a machine and companion model, as per Murray's models of interaction.

6 Discussion

This thesis studies how teachers and students reacted to the concept of open asynchronous communication studies through testing and discussing a design model for tracking, processing, and supporting said studies. In this chapter, I discuss the implications and limitations surrounding the results presented in the previous chapter.

In Section 6.1, both the perceived flexibility of the CST and the concern about less organized or weaker students are discussed in more depth. In Section 6.2, issues of meaningfulness and relatedness are brought up, also considering the teacher's changed role as a guide and coach in a fully student-oriented learning system. Next, in Section 6.3, the challenging question of how groups could be better implemented is discussed. Section 6.4, which considers the possible adoption of a CST-based system at the University of Turku practice, is divided into three subsections. Section 6.4.1 deals with the administrative aspect, Section 6.4.2 explores how the CST would fit in among currently used systems, and Section 6.4.3 proposes the development of a functioning prototype. Section 6.5 considers some of the limitations of this study. Finally, in Section 6.6, I bring up some other areas of research that may be relevant to pursue in the wake of this study.

As an answer to the research question, it can generally be stated that all testers were intrigued by the possibilities presented by the CST model. This can be seen in how actively they all engaged in the process of co-design, identifying their role in the targeted process of university-level communication studies, and sharing not only their knowledge and experience, but actively imagining possible situations and solutions, as well as reflecting on the possible implications of implementing the system. This suggests that the design has touched on a critical area for further development and study of the proposed new concept for communication studies.

6.1 Flexibility and support

One of the main purposes of the CST is to make communication studies more flexible. The strong positive response shown in the results indicate that this goal was definitely reached. However, several testers indicated concern about less organized or weaker students. In this section, we consider to what extent this concern is valid in an open system like the CST, first addressing the situation of weaker students, and then that of less organized students.

Based on the data, it appears that the testers concerned about weaker students were worried that the lack of scheduled classes could mean weaker students would not get the support they needed. However, while the proposed concept in this study does remove courses, it would still retain a possibility for face-to-face interaction with teachers. This interaction would come chiefly in the form of weekly workshops and be complemented by ad hoc workshops or meetings with the teacher. The CST has numerous ways to indicate the need for more support. The CST design already contains the initial survey as well as the quick survey service, which can let teachers know more support is needed. Further, the student can approach a teacher in person during a workshop or office hour, or any other

time via email. We return to how teachers can take initiative in offering support when discussing the teacher's role below (Section 6.2).

Regarding less organized students, the CST offers a solid set of support functions for both students and teachers. As shown in Section 3.2.5 the Planner view contains a possibility to set how many tasks a student wants to complete in a certain time period. If this goal is missed, the student and teachers will receive a notification. Teachers will also receive notification if a student who has not reported that they will be inactive has not logged in after a certain time. Depending on a student's team privacy settings, their inactivity might also be visible to their teammates.

The lack of courses can also help reduce inactivity. Currently, if a student loses track of a mandatory language course, it can be difficult to fit it into their schedule later, as the course is only offered at a particular time, and can only cater to a set number of students. With the CST, however, any time a student wants to activate themselves in their communication studies, they should be able to find suitable Task Types they can work on. If they feel unsure, they can go to the next weekly workshop or contact teachers directly to discuss what kind of activity could be considered next. They might realize that something they are currently working on in a substance class qualifies for a relevant Task Type. Since the CST largely removes timing and content restrictions imposed by courses, the threshold for resuming communication studies is extremely low.

Further, as shown in Figure 3.1, it would be recommended that students register for the CST at the start of their studies, as part of one of their first group meetings with their study counsellor (in Finnish "opinto-ohjaaja" or OPO). The onboarding could be further enhanced by involving tutors and student organizations, which, in line with a personalized learning approach, would further integrate communication studies into the overall student experience in the campus environment. This should ensure most students will be registered and given a basic orientation of both the system and the required studies.

The concern about students lacking enough skills in Swedish to engage in more authentic communicative tasks raises a larger problem of the current state of Swedish in tertiary education. While this issue is partially a problem that is larger than the scope of this study, it might be that a wider reconsideration regarding how languages are taught in formal education nationally could help Finnish-speaking students learn Swedish. Further, in the proposed case environment of the CST, that is the Computer Science department at the University of Turku, the close proximity of the CS department of the Swedish-speaking Åbo Akademi University could plausibly offer opportunities to complete Task Types in Swedish.

All in all, the CST-based concept can offer comprehensive support for students, regardless of skill-level or ability to organize. These measures should increase levels of participation and completion, and help mitigate the sensation of losing track some teachers noticed and students reported during the COVID pandemic. Naturally, the old adage that you can lead a horse to water, but you can't make it drink still holds true.

6.2 A guided learning experience

The departure from a course-based learning system to a Task Type-based system allows for much greater agency for students to determine the topic and context of the communicative tasks they choose to develop their skills. The sequencing of Task Types in various tracks, as well as revising tasks when after formative feedback from teachers, provide an iterative and adapting loop, in which development should take place.

The open multisequential design appealed to students and most teachers, but one teacher tester was concerned about losing the structured approach that can be used in course-based teaching. His point was that students might miss out on synergies from certain tasks developing particular skills (T4, general comments). To this, two responses might be made. One, one-size-fits-all course design may indeed contain these kinds of synergies (external affordance), but due to lack of personalization and flexibility, students may not perceive or be motivated to fully make use of them (internal affordance). Two, while the CST-based approach is multisequential, learning path design can still work with Task Type design and sequencing to create opportunities and requirements to practice certain skills.

Further, while a student may miss out on some of the more linguistic-based synergy, removing the “classroom walls” introduces the possibility of finding the perhaps more authentic synergy between communication skills and a student’s academic and personal life. With the possibility of using personal activity and substance course tasks as content for completing Task Types, it could be argued that the net amount of external affordances to learn increases, while the higher levels of relatedness and personalization also increase the internal affordances of perceiving authentic communication scenarios and feeling motivated and rewarded to engage in them. Student testers appreciated this, and most teachers felt inspired to meet and help students when and where it mattered to them, rather than pushing a monolith of content to all.

One does, however, need to consider, as T4 pointed out, that a multisequential system would mean teachers would often deal with the unexpected, which could lead to teachers feeling a bit disjointed if students working on wildly different projects attend weekly workshops. That said, however, even in open and emergent systems, patterns tend to emerge quite quickly, and students of a particular major are likely to be engaged in similar kinds of tasks at certain times of year, meaning there may not be so much diversity as could be feared.

Finally, a teacher in this system would not be without agency when it comes to determining what path students take. The CST allows them to monitor student progress within the languages and tracks and could help them spot emerging issues. If deemed necessary, the teacher could then recommend certain Task Types, or even particular exercises or activities that would satisfy Task Type requirements. In fact, every task review presents an opportunity for guidance in the formative feedback a student receives.

6.3 Guilds and pick-up groups

In regular formal education, group work is often problematic. If individual summative assessment is used, it is often challenging to develop well-working assessment schemes. Groups were also raised as a potential problem with the CST-based approach to communication studies, as asynchronous work and group work appeared incompatible at first glance.

In the initial CST design, the idea was to use the initial survey as a basis for group creation. However, going back to the idea of involving student tutors in the onboarding process, an alternative option would be to create initial teams that mirror the tutor groups first-year students are assigned to. As part of the onboarding, there could be opportunities to do the first few Task Types in the Teamwork track with this group. Perhaps if students spend more time together, there would be more commitment to the group.

Starting out in a group might help make sure that students who would otherwise not take the initiative to join a group find people to work with. That said, whichever grouping mechanism is used, there should be an easy way to opt out of a team. For students without a team, creating a well-working ad hoc group finding function in the CST would be critical, since some Task Types would require working with others.

In order to incentivize people to stay in a group, there could be some kind of team point system, tracking how well groups perform. The current test design allows teams to give their team a name, but there could be more customization options available, as well, drawing inspiration from how guilds work in MMORPGs.

6.4 Implementation of a CST-based system

While most of the testers expressed optimism regarding how viable a system like the CST would be at the University of Turku, implementation would need to address issues of reforming administrative frameworks for teaching, cross-platform functionality with existing systems, as well as practical development work of a functioning prototype.

6.4.1 Administrating teacher workload and time allocation

When removing the course as a default unit from a learning environment, it becomes apparent how much of the administration of formal education is tied up with it. A course usually has a set duration, in a set location, with a certain amount of contact teaching and independent work factored in. This system makes it easy to commoditize students, teachers, and learning, placing everything into its own compartment in the university bureaucracy.

One solution for an alternative method directing resource allocation could be to assign a certain number of students to a teacher. For example, at the start of a year, each teacher of a particular language covered by the CST would be allotted approximately 200 new students. At certain intervals, perhaps twice per year, there would be an update phase, where a teacher would take on new students to make up for any who have completed their communication studies, or have become inactive long enough to be dropped by the system.

Since each student would have three teachers on their team, there could be a challenge if most students leave one language undone, while completing the others. This, however, could be mitigated by a notification system, where a teacher of a language could notice their language being neglected, and proposing that the student take action with it. Another challenge is the fact that the Main Track Task Types can be completed in any language, so even if a student had completed their required Task Types in the Swedish track, they could still submit tasks for the Main Track in Swedish, meaning that a Swedish teacher would need to be “on call” until a student’s communication studies are complete. Finally, there is the issue that not all languages have the same amount of required studies. This might mean that the number of students per teacher would be dependent on the language, with Finnish teachers having the fewest students, and Swedish teachers the most.

Perhaps a system modeling software could be used to simulate throughput and optimize the number of students per teacher. Ideally, when taking the system into use numbers should be quite conservative, to gauge the actual work amount. Data on average interactions and time spent per track could also be gathered to further optimize student allocation. For this work, separate data analysts would need to be employed, as it should not be expected that teachers could do this, even if the metrics were visible for them. As was noted in Section 5.1.2, teachers appreciated only receiving data needed for them to do their job, and more data might only lead to feeling overwhelmed.

Another possible challenge with a system with such flexible timing is that it is possible that the ebb and flow of the number of submitted tasks would vary wildly. Here, perhaps the simplest solution would be to have a notification system that would tell students if a teacher had more than a certain amount of submissions to review, letting them know there may be a delay with the feedback. If there were several teachers of a language, a feature could perhaps also be added where the CST automatically would divert tasks to another teacher if it noticed that one teacher was receiving many more tasks to review than someone else.

6.4.2 CST, Ville, Moodle and Peppi

If the CST were to be implemented at the University of Turku, it would have to find its place in relation to three other platforms currently in use at the university which share some of its features: Ville, Moodle and Peppi.

Ville is an online learning environment in which teachers can set up courses containing assignments that are often automatically graded. This makes it particularly suited for simple computer science, math, vocabulary and grammar exercises. It visualizes progress with progress bars, similarly to the CST, but the feedback from the automatic assessment is mainly summative. It is designed around a course-based system, with courses being divided into rounds, which, in turn, contain assignments. (Laakso, Kaila & Rajala, 2018)

Moodle is another learning environment widely in use at the University of Turku. Like Ville, it is a course-based platform, with more options for containing information, but fewer automatically graded assignment types. Similar to Ville’s rounds, a Moodle course area is

divided into topics, which can contain information in various media formats, assignments, forums, etc. Moodle offers a wide variety of ways to track student activity and progress, although this might not be immediately apparent to the user or taken into use by course designers. The most common way Moodle is currently used is as a simple repository for course material.

Unlike Ville and Moodle, Peppi is a data system that focuses more on curriculum management and the infrastructure of studies. It is more like the CST in that it is chiefly used to plan degree structures, contain study guide information, and track progress. In the fall of 2021, Peppi will replace previously used Nettops in keeping track of student records at the University of Turku, so at the time of writing, this system has not yet been fully implemented. It is therefore difficult to fully discuss its role compared to the CST. According to current documentation, Peppi features possibilities to divide a course into subsections, as well as divide course participants into smaller groups, but generally is still designed around the concept that student performance is measured in completed course units, or “realizations” (Toteutussuunnittelu, 2018).

Technically, the concept that CST is based on could be implemented using either Ville or Moodle. However, the flexibility of Task Types would then require all tasks to be set to manual grading, which would eliminate the benefit of automatic assessment, which especially Ville emphasizes as a key feature. Further, the progress visualization in Ville would likely not be able to cope with the multi-track progress of the CST, instead showing only how many of the total amount of Task Types have been completed. Moodle’s gradebook could be divided into different grades for different tracks but would not be able to cope with multiple tracks advancing from one assignment.

One of the fundamental problems with both Moodle and Ville is that they tend to put a teacher into a double role of both teacher and developer. While a teacher can modify these platforms to perform a variety of functions, this detracts from the time a teacher has to actually interact with students. This frustration was visible in the comments regarding all the “secretarial” work connected to teaching these days. While the CST would eventually feature possibilities for customization, teachers using the CST are a user group that should not need to make design changes for the system to work. This aspect was noticed by teacher testers when they commented on the simplicity and easiness of the design.

Both Ville and Moodle could complement the CST, however. Ville could house grammar exercises that require set answers, which could satisfy some possible Task Type requirements. Moodle, on its part, could be used to provide supporting materials for other Task Types, as the CST itself does not provide any materials. For example, there could be a Moodle area dedicated to tips, exercises, and examples for oral presentations in the different languages. The CST could link to these from the Language Resources view.

With regard to Peppi, the CST could convert completion of certain tracks into ECTS and send this information to Peppi through an interface accessible by the teacher or administrator.

An administrator would just have to determine what kind of track progress corresponds to currently existing courses so that the system would update the student's record appropriately at the given time. Eventually, it may be simpler to convert communication studies to a uniform block in the Peppi Data system.

6.4.3 Developing a prototype

Following the successful initial concept testing of the design model of the CST, the next logical step is to develop a functional prototype. A team of developers could use the current design, as well as the feedback gathered from the usability test, to create this working model, which could then be used for the next, expanded, round of testing. Perhaps parts of this project could be offered to groups as a Capstone project at the University of Turku, or some other suitable project course. Another option could be to try to apply for project funding particularly for this development. At any rate, it is hoped that the development of the CST or a similar system would continue in some form.

6.5 Limitations of the study

This study specifically focuses on how the concept on which the CST is based was received by the testers, as experienced through the use of and discussion around the design model. Although the number of participants in this study was sufficient for a usability test to discover key strengths and points of development, this study is too preliminary to draw any definite conclusions regarding the full value of a system like the CST. The design model precluded any state of the program that was not predetermined by the designer, so it can be assumed that quite a lot of development-related issues and errors were not discovered in the usability test.

While the ten testers met the requirements for a usability test, it could be argued the number is too small to provide a significant answer to general attitudes towards the CST-based concept. Instead, the answer is more qualitative in nature, shedding light on which aspects of the concept might resonate well, and which require more thought.

Despite the five teacher testers not being close colleagues to the developer of the model, it is still possible that there were some subconscious biases included in the selection. That said, the main criteria were to have each language and gender represented, with both more and less technically savvy teachers represented. While knowing the teachers may have induced some biases, it also allowed selecting suitable candidates.

Another bias, this time on the side of the testers, could be that the teacher testers may have avoided some negative feedback due to the fact that the facilitator of the interviews was both the developer of the model and a colleague. However, it might also be the case that being very familiar with the specific work environment of the testers allowed a deeper dimension of discussion during the interview, which might not have been possible with a facilitator who was not familiar with the work of a language teacher.

She feels this shows that you need to understand the work a language teacher does to design something like this, and a purely “technical” person could not have done it. “We don’t need any strange features, but certain things, and this design contains exactly that. If I have a Moodle problem, or other IT-problem, the best answer I get is from a more advanced colleague. Helpdesk don’t understand our work, so they cannot always help us in use cases.” (T3, general comments)

While this study might not be sufficient to serve as a proof of concept, the results gathered serve as an indication that further development followed by more extensive testing is warranted.

This study did not include a section considering similar approaches, as none were found as part of the research process for this study. However, a larger literature review of new experimental and digitalized practices concerning curriculum design could have possibly yielded more information about similar initiatives. The work references regarding Personalized Learning suggest there is widespread and active interest in developing and trying more flexible and dynamic systems on all levels of education.

6.6 Future research

As this study primarily focuses on analyzing the empirical data from a usability test, there is less focus on supporting research within PL, SDT and SLD. Further research into these fields and comparison with previous research could yield more focused development goals for future iterations of the CST model and the concept it is based on. It may be worth researching the areas where it seemed the work of Murray and Larsen-Freeman converged, as well as looking into digital affordances as they pertain to learning.

The scope of the learning concept could also be expanded from communication studies to substance studies in, for example, Computer Science, where measuring competence in a non-course-based system could really help, as so many students have jobs and work on personal projects alongside their studies. The concept of Task Type tracking could probably be considered with regard to programming languages, software design, and game development, as each of those areas contain many practical activities with similarly wide application grounds as the communicative tasks mentioned in this study.

This study can also be considered an attempt to start a discourse on measuring competence in formal education in a non-grade-based system in general, and studies or action research could be carried out with iterations of skill-tree-based tracking.

Besides bureaucratic convenience, using a one-dimensional summative assessment like a grade should not be necessary anymore. A digital machine model can process a much more multifaceted model of competence tracking, while providing easily interpreted indicators of progress. Are courses and grades not just a remnant of a time when filing was done manually at the end of term? The procedural affordances of our current systems do not need a specific time to file competence measuring data in bulk, but can provide a more dynamic model, which can more closely represent the complex and dynamic system in which learning happens. With a solid approach based on converging theories in pedagogy,

psychology, and technology, combined with functional design of the technological tools needed, the solutions for this kind of learning environment are just waiting to be discovered and explored.

7 Conclusion

This thesis aims to study the reactions of learners and educators to a concept of an asynchronous approach to obligatory communication studies at the University of Turku. These reactions were recorded during a usability test of the Communication Studies Tracker (CST), a design model of a tool created to allow the tracking and assessment of communication studies without any specific communication courses.

The pedagogical concept is based on a combination of Self-Determination Theory, Personalized Learning, Complex Dynamics Systems Theory, and utilizes the various affordances provided by digital media. This approach puts the learner at the center, providing support and possibilities to engage in meaningful actions, while allowing the student agency to affect timing, method and content of their actions, within set parameters. The design was built with an aspiration to follow best practices when it comes to design of a good user interface.

The CST design model was built to provide an alternative way to complete obligatory communication studies for an undergraduate degree at the University of Turku. Instead of having courses, students would complete a range of Task Types in the required languages. These Task Types would cover all the communicative areas of the degree requirements. Activity done in substance classes or a student's personal life would be eligible for credit as a Task Type. The timing, method and content of the specific tasks would be up to the student.

The CST design model features a separate client for students and teachers. While both clients share a visual appearance and design structure, the student client is focused on providing a clear visualization of the student's progress, as well as a clear interface for submitting tasks and reviewing feedback from the teacher. The teacher client, on the other hand, is mainly designed to provide a clear oversight of the progress of all their students, as well as a clear interface for reviewing and assessing submitted tasks. The system also provides a range of helpful notifications and support structures, such as a way to report planned inactivity, and automatic notifications in case of missed objectives.

The data for the study was gathered via a usability test of the CST model. The test took place remotely via the teleconference tool Zoom, with the testers sharing their screen as they used the system. Five students and five teachers were invited to test the model through a number of usage scenarios. The testers could also discuss their view of the concept as they used the system, and there was a short interview at the end of the test, making the test session also work as part of a co-design process. The test session was recorded. The testers' comments and impressions were observed from the recording after the tests were completed, and the responses were coded into categories for analysis.

The results showed that the testers felt positively about the flexibility and meaningfulness the CST approach brought to communication studies. It was generally felt that the system

was a viable option that could be implemented at the University of Turku. Teachers felt especially appreciative of how the system would allow them to focus on supporting students, as well as the automation of menial tasks it would provide.

The results also showed that the most common source of concern was whether weaker or less organized students could cope with an autonomous study approach. There were also questions on how this system would be different or synergize with other platforms and systems in use at the university. Other worries included whether the proposed Task Types could provide useful learning opportunities and paths, as well as how group work can function in a system where every learner can proceed at their own pace. Teachers also expressed a clear worry about how a system that departs from the current bureaucracy would affect their position, as many professional aspects such as time allocation and teaching limits rely on the current course-based system.

The results from the usability test show that all testers were able to complete all the use scenarios, even though at least one tester encountered some kind of issue in almost every scenario. It was determined that the design mostly followed good principles of design, although many practical suggestions for improvement of the design were gathered through the usability test. The suggestions included some ideas that could be applied to improve accessibility as well as manage the group work aspect, which had raised some concern.

The results are in line with expectations, with both user groups experiencing increased flexibility and meaningfulness. While the removal of current organizational boundaries raised a number of questions, it was argued that, even though this did increase chances for unexpected situations, this change should mainly result in increased agency and ability to take action when and where needed. While existing systems, such as Moodle and Ville, grant teachers the potential for significant flexibility, the fact that they need to create this flexibility themselves means a lot of this potential goes unused. The CST provides a structure within which to exercise flexibility without having to have full responsibility for first creating a framework for it. It would, however, be necessary to re-evaluate how a teacher's work hours should be allocated with this system. A possible solution would be to allocate a certain number of students, rather than hours, within the system, since the number of hours required per student is not homogenous.

As the approach was considered viable by the testers, a logical next step would be the creation of a functioning prototype of the CST, with which further, more comprehensive, tests could be carried out. The concept could also potentially be considered in conjunction with substance studies, as the perceived benefits of a course-free system could be leveraged in other subjects as well, particularly those with more practical applications, such as computer science. In general, the results could spark further studies focusing on a more dynamic tracking of competence in a variety of contexts and education levels. The converging ideas within psychology, pedagogy and technology explored in this study may warrant further study, as well.

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Appendix A: Teacher usability test: Introduction text

In this usability test, you will try a service designed to track students' progress in their communication studies. Instead of obligatory courses, students complete a range of task types in Finnish, English and Swedish, until enough work is completed to receive credits.

This system is designed for a curriculum where, in order to complete their obligatory studies, students must complete a Main Track of communicative tasks (in any applicable language), as well as a certain amount of task types in each of the three required languages (Finnish, English & Swedish). The task types are divided into Oral, Writing and Reading tasks.

The system you will be testing supports students setting their own pace and allows them to choose in what way to complete the tasks. It is a tool that can keep track of students' progress in the Main Track and each language, as well as provide an interface for submitting tasks, providing feedback, and other important information.

You will first be presented with a few test scenarios for you to complete. After that, you will have an opportunity to discuss the experience and ask questions from the facilitator. You are also welcome to explore the service more freely in addition to the prepared scenarios, but this model does not have very much functionality beyond the test scenarios.

The entire test session will be recorded.

After the test session, there will be a short interview about the experience. If you want, you can also get the questions in writing, in case you want a bit more time to think about your answers.

Use cases:

The following part of the test will present you with a few use scenarios. As you complete the tasks, please "think aloud" so that we can document your thought process. If you get stuck, please ask the facilitator for help. You can also help to "reset" the model by clicking "R", or clicking the "Overview" button on the model.

The model will first present you with a short introduction text, before taking you to the actual service.

During the test, the model will highlight which areas of the screen can be interacted with when you click somewhere on the screen.

Appendix B: Teacher usability test: Test Scenarios

1. It seems you have received some kind of alert. What for?
2. You have tasks to review. Let's give some feedback, attach a feedback file and give a grade to a task that has come in.
3. It seems you have updates about three students. Check the notifications to see if you can find out exactly what is going on with each of them.
4. Orvokki seems to be doing well. Have a closer look at her progress in English.
5. Try to find out what task types your students need to complete their English Oral track.
6. You want to get an overview of your students' information and progress. Can you find a way to get that?
7. You have been able to get a voice coach to come do a workshop with up to 15 students. Schedule a voice training workshop using the service.
8. You recently held an interview with Onni Opiskelija, after he had completed a reading assignment. He met all the requirements, so now he should get task credit for it. (Known issue: This can currently only be completed when viewing Onni's progress in English.)
9. Check that your email is set correctly in the system.

Appendix C: Teacher usability test: Post-demo interview questions

1. What features felt the most useful in the service?
2. Did you think of specific things that could be better?
3. Did some features feel difficult or too complex? How could they be made easier?
4. Was there some feature you thought was missing? What?
5. Was there some feature you did not feel was necessary? Why not?
6. How do you feel a system like this would affect your overall work time use?
7. In what way do you feel this system affects your agency as a teacher?
8. How do you feel this system would help students of different abilities develop their communication skills?
9. Are there critical aspects to communications studies that this system seems to overlook?
10. What kinds of accessibility considerations do you think are important to include in this system?

Appendix D: Student usability test: Introduction text

Where from?

Age?

Previous education?

In this usability test, you will try a service designed to track students progress in their obligatory, bachelor level communication studies. Instead of obligatory courses, students complete a range of task types in Finnish, English and Swedish, until enough work is completed to receive credits.

This system is designed for a curriculum where, in order to complete their obligatory studies, students must complete a Main Track of communicative tasks (in any applicable language), as well as a certain amount of task types in each of the three required languages (Finnish, English & Swedish). The task types are divided into Oral, Writing and Reading tasks.

The system you will be testing supports students setting their own pace, and allows them to choose in what way to complete the tasks. It is a tool that can keep track of students' progress in the Main Track and each language, as well as provide an interface for submitting tasks, providing feedback, and other important information.

In this usability test, you will try a service designed to track your progress in communication studies. You will first be presented with a few test scenarios for you to complete. After that, you will have an opportunity to discuss the experience and ask questions from the facilitator. You are also welcome to explore the service more freely in addition to the prepared scenarios, but this model does not have very much functionality beyond the test scenarios.

The entire test session will be recorded.

After the test session, there will be a short interview about the experience. If you want, you can also get the questions in writing, in case you want a bit more time to think about your answers.

Use cases:

The following part of the test will present you with a few use scenarios. As you complete the tasks, please "think aloud" so that we can document your thought process. If you get stuck, please ask the facilitator for help. You can also help to "reset" the model by clicking "R", or clicking the "Overview" button on the model.

The model will first present you with a short introduction text, before taking you to the student survey. In this demo, the questions are not answerable, but please read through them and give your thoughts on them before progressing to the actual service.

During the test, the model will highlight which areas of the screen can be interacted with when you click somewhere on the screen.

Appendix E: Student usability test: Test scenarios

1. As a new user, you want to check that your email is correct. Try to find where it is set and shown.
2. How are your studies in English progressing?
3. It seems one of the tasks you submitted was rejected. Why? (known issue: you cannot check this from the English or All Languages progress screen)
4. You may need to be absent for a while this period. How might you use this service to report this to the teachers?
5. You've recorded yourself taking part in a meeting in Swedish, and think it meets the requirements of an Oral Task Type in Swedish. Try to submit the task to the service.
6. You've completed a few tasks in the Main Oral track. What's the next task type you need to complete?
7. After the last workshop, you feel a lot better about your Swedish progress. Let your Swedish teacher know that you feel your Swedish studies are going "OK" at the moment.
8. Two of your teammates have completed tasks recently. Go and write some peer feedback to them. (Known issue: for one of the students, the task you can give feedback to is not actually their latest task)
9. It seems some of your teammates do not share much information with the team. Go and review your own privacy settings.

Appendix F: Post-demo question form

1. What features felt the most useful in the service?
2. Did you think of specific things that could be better?
3. Did some features feel difficult or too complex? How could they be made easier?
4. Was there some feature you thought was missing? What?
5. Was there some feature you did not feel was necessary? Why not?
6. How do you feel a system like this would affect your study progression overall?
7. In what way do you feel this system affects your ability to plan your studies?
8. Do you think this system would be able to provide enough support to improve your communication skills?
9. Are there critical aspects to communications studies that this system seems to overlook?
10. What kinds of accessibility considerations do you think are important to include in this system?

Appendix G: Coding grid

Concept

1. Positive comments

a. General

Sample entry: *It is good, beautiful, and simple* (S3, q3)

b. Adoption/implementation

Sample entry: *She feels the whole point of the university is to develop how we arrange the teaching, so she feels this development is in line with the university's strategy.* (T1, q7)

c. Timing/flexibility

Sample entry: *"Jos vaimo sanoo että vahti lasta, ja pomo sanoo että mene torille valvomaan järjestystä. Sit mä en tee ruottii enkä englannin tehtäviä."* (S1, q7)

d. Meaningfulness/relatedness

Sample entry: *She is able to flexibly and dynamically assess how much she needs to do and when, as the progress bars clearly show her if she is a bit behind somewhere, and she will be able to assess if she needs to push intensively or break up the effort into smaller bits.* (S5, q7)

e. Teacher role

Sample entry: *She thinks she would be more of a coordinator than a teacher of a certain course. She would be more like a coach, which she is not against.* (T1, q6-7)

f. Automation

Sample entry: *She finds this alternative different than having to make an excel chart of a student herself. The automation provides a lot of help. "Tämä on ihan loistavaa!"*(T3, gc)

2. Concerns/reservations

a. Weaker/unmotivated/disorganized students

Sample entry: *She wonders what tools there are to help the students manage their time. She says a lot of students are surprised about having to timetable their work in her courses.* (T2, q1)

b. Interaction/synergy with other systems/platforms

Sample entry: *He mentions that he is already using moodle, ville, nettiopsu, peppi, so will there be another system to use just for language studies.* (S3, intro)

c. Group mechanics and coordination

Sample entry: *He likes the general idea of having a group to do group tasks from other classes for communication credit as well, but he is bothered by something. "Tääs on vaan se että, tota, tota" When everyone is doing things on their own thing, and a team task comes up in a track, how will it work if everyone is "somewhere else" in their studies?* (S3, sc8)

d. Quality of task types

Sample entry: *"Jos sul on tääl language resourssit, sul on täsä sellainen roskaläjä, niin tuskin se innostaa tutkimaan..."* (S4, q8)

e. Administration

*Sample entry: Next she wonders how admin would feel about a system like this.
Would a teacher be responsible to clearly plan the use of their work hours? (T3, q6)*

Design

1. Positive comments about design elements

Sample entry: She really likes that the progress bars make it really concrete at which stage you are in your studies. (S5, q7)

2. Concerns/questions about design elements

Sample entry: He feels [the teamwork] screen is a bit unclear. There seems to be a lot of information, but it is hard to find the needed parts. (S1, sc8)

3. Making correct guesses/interpretations

Sample entry: She correctly assumes this will send a notification to the teacher. (S5, sc7)

4. Making wrong guesses/interpretations

Sample entry: He first went to language resources, and thinks he would be able to upload [the task] from a link from there. (S3, sc5)

5. Not noticing things

Sample entry: She says she will “peek” into the planner, but does not see the [report inactivity]element there.

6. Learning the system

Sample entry: He then asks what auxiliary stands for, and he is clearly confused about something. After thinking about it for a while he gets it. It just took a while for him to grasp the hierarchy of the list. (S3, sc6)

7. Request for features

Sample entry: He says the teamwork page could have a button to join a queue, and when it is ready to fire, you have 24h to click ready, and your team would be formed for that task. (S3, q6)

8. Accessibility

Sample entry: She asks if this is just for computers. She would think mobile versions would be needed. (S5, q10)