

ADDRESSING THE GAPS & NEEDS OF PRIMARY SCHOOL TEACHERS WHEN DESIGNING THE D-TIPS TOOLBOX

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS	4
EXECUTIVE SUMMARY	5
Key Findings	6
INTRODUCTION	8
The D-TIPS Toolbox	8
What does “Best Practice” look like?	9
Questionnaire & Interview	10
RESEARCH FINDINGS	13
What are primary school teachers doing already?	13
Student-Centered Learning	13
Teacher as Facilitator	14
Technology	14
Cross-Disciplinary & Integrated Learning	14
Emotional Intelligence & Active Citizenship	15
How does design thinking align with best practices & build on current practices?	15
What obstacles inhibit innovational goals of primary school teachers?	18
Time	21
Attitudes & Culture Within the School	23
Access to Materials & Technology	24



How can we address these obstacles when designing the D-TIPS Toolbox?	25
Easy to Start	26
Easy to Scale	27
Explicit Link to the Curriculum	27
Adaptable	28
Adds Value & Opportunities for Development	28
Access to a Variety of Materials & Resources	29
What are the next steps?	32
REFERENCE LIST	35
ABOUT THE AUTHORS	37
THE D-TIPS CONSORTIUM	38
ANNEX: QUESTIONNAIRE (ENGLISH VERSION)	40

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Executive Summary

In schools around the globe, the awareness of the potential for design thinking is growing. Many initiatives are gaining traction, from 'makers spaces' to robotics, 3D printing, programming and social entrepreneurship. These trends align with many of the P21 learning goals and EU key competencies that are driving best and innovative practice in European schools.

In recognition of the potential value for design thinking in education, D-TIPS (Design Thinking in Primary Schools) aims to create the D-TIPS toolbox, a toolbox designed specifically for primary school teachers, containing tools and methods that will enable teachers to facilitate activities in the classroom, using the design thinking process and mindset. The D-TIPS toolbox will be accessed in both online and offline formats, and bolstered with in-depth training content to support teachers in the implementation of the toolbox.

While we have a good understanding of European educational goals and how design thinking fits into these frameworks, D-TIPS first wanted to discover more specifically how European primary school teachers are innovating in their schools currently, what obstacles hinder innovation, and how D-TIPS can develop an evidence-based toolbox that will enrich the teaching practices of primary school teachers and the learning experiences of their students.

To do this we used our network to speak with 48 primary school teachers in Spain, Romania, Lithuania, the Netherlands and Belgium where we will be piloting the D-TIPS toolbox. Using an online questionnaire and in-depth interviews, we asked educators to define "best practice", what they thought was important for the future of education and how they are currently innovating in their school. We then asked what are the most





significant obstacles are that slow down or prevent them from adopting new tools or methods. From here, we then wanted to uncover what their needs are, that motivate them to adopt new tools or methods.

Key findings:

- Primary school teachers in Europe recognise and are actively striving towards 21st century learning goals and attitudes, and engaging with several innovative practices that focus on student-centered and directed learning, digital literacy and technological engagement, creative and complex problem-solving, integrated and collaborative learning and cross-disciplinary projects.
- Design Thinking aligns with many of the 21st century goals, and current innovative practices of teachers, but is not a generally familiar concept among teachers in most schools. This finding reveals the potential for teachers to not only include design thinking in their current practice, but to also extend and develop their competencies further.
- Primary school teachers face many obstacles that slow down and prevent innovative practices from gaining traction in their schools and communities. Many schools do not prioritise experimentation and testing new methods, and many teachers struggle to find the time in their own schedule to test and experiment in their classrooms. These factors affect the attitudes and cultures of schools, making it challenging to try new methods.
- Through a better understanding of what challenges teachers face, D-TIPS is able to uncover their needs and what factors can motivate teachers to test out new tools and methods.



The most significant factors that we will refer to in the design of the D-TIPS Toolbox are:

- the ease with which to start using the D-TIPS toolbox.
- the ability to scale the D-TIPS toolbox to fit different sized classes, age groups and projects.
- clear links to national curricula.
- flexible tools that invite collaboration and work easily across subject areas and learning abilities.
- translations in native languages of pilot countries.
- development and training opportunities for teachers.
- a diverse range of online and offline materials and resources.

With these findings as our departure point we aim to design and implement a toolbox for Primary School teachers that puts children, with the guidance of teachers, in the driver's seat of their own learning journey from an early age. The design thinking process within an educational environment provides a framework for children to engage in complex and creative real-world problem solving, and inquiry-driven learning that is open-ended, fun and collaborative. With the valuable information provided from our participating teachers we want to develop a toolbox that speaks to core of what inspires and activates teachers, but is flexible enough to navigate the current challenges of the teaching profession.

Introduction

The D-TIPS Toolbox

D-TIPS – Design Thinking In Primary Schools – is an Erasmus+ funded project, with key partners across Europe, in Spain, Belgium, the Netherlands, Norway and Lithuania, working together to develop the D-TIPS Toolbox: a multi-functional, design thinking toolbox, specifically for use in primary schools.

The ability to develop critical-thinking, complex problem solving, reflection, self-regulation and collaboration are high on the agenda of European schools, in order to prepare children to face future societal challenges. Design thinking provides a practical and structured process to activate these abilities and enrich learning.

In recognition of the potential value for design thinking in education, the D-TIPS Toolbox will contain tools and methods that will enable primary school teachers to facilitate activities in the classroom, using the design thinking process and mindset. The toolbox will be composed of a series of different tools, methods and approaches that can be accessed in both online and offline formats. We will also provide in-depth training content contextualised in an online community to support teachers in the implementation of the D-TIPS Toolbox.

To ensure the relevance, quality and contemporaneity of the toolbox, D-TIPS has extensively researched and gathered first-hand experiences from European primary school teachers. This report is an analysis of the research gathered, which will directly inform the design and development of the D-TIPS Toolbox.

What does “Best Practice” look like?

Best practice in education is generally accepted as the current pedagogical frameworks and methods, proven to be the most effective and relevant in preparing children for the future. Considering the context of our project, we are choosing to view “best practices” through the lens of the [21st century learning goals](#) [1] and the current [EU key competencies](#) [2], as the most widespread and accepted notions of progressive pedagogical frameworks in Europe. For a more specific guide on what current innovations in education look like, we can also refer to the recent [report](#) [3] from the Christensen Institute. While it is data collected within the US, their tagging system for identifying widespread innovation trends in schools gives valuable insight into the common innovative goals of teachers.

Many of the skills, attitudes and processes outlined in these documents can also be accessed via the design thinking process. ‘Design thinking can help students to be prepared to deal with difficult situations and to solve complex problems in school, in their careers and in life in general, moving beyond the limit of increasing students’ proficiency in traditional subjects’ [4].

The design thinking process can be summarised as a non-linear, cyclical series of steps - discovery, interpretation, ideation, experimentation and evolution [5]. Within each of these steps, many complex, creative, higher-order thinking skills and attitudes are brought into play, but all for the purpose of working towards a common goal/objective. ‘Design thinking combines empathy for understanding the context of a problem, creativity in generating ideas, insights and solutions, and rationality to analyse and match solutions to the context. It also promotes a collaborative approach where everyone contributes to its knowledge and experience’ [6].



Teachers already recognise the value of these skills and strive to create these real-world experiences for children; Design thinking provides a practical and structured process to achieve this. In many schools, awareness of the potential for design thinking is already evidenced by the trending popularity of '[Makers Spaces](#)' [7] across the globe, engaging children with [robotics](#) [8], [3D printing](#) [9], AI and programming, as well as social-enterprise entrepreneurship programmes for students. Alongside such initiatives are comprehensive online platforms such as [Learning Accelerator](#) [10] that provide resources and examples of innovative, design thinking inspired classrooms. Educational platforms are also being adopted increasingly in schools as an effective, user-centered tool to personalise learning and track student progress.

Questionnaire & Interviews

To find out how European primary school teachers are innovating, we used our network to contact primary school teachers in the countries where we will be piloting the D-TIPS Toolbox using an online questionnaire. To investigate deeper, we also reached out to primary school teachers to interview them via Skype and in person.

A [questionnaire](#) (see annex) was translated and distributed in english, spanish, lithuanian and french, with a total of 48 responses. Of the interviews, each partner spoke with 2-3 teachers in their respective countries, totalling in 12 interviews. The interviewees were primary school teachers from Belgium, Spain, Lithuania, Romania (via our Norwegian partner) and The Netherlands. All were able to communicate in their native language during the interview, to ensure a clear understanding and interpretation of their responses.

We started our line of inquiry by asking the participants their views and experiences of "best practice". While we already have a good



understanding of what “best” and innovative practices are in theory and how design thinking fits into these frameworks, D-TIPS wanted to discover more specifically what primary school teachers in Europe define as “best practice” and how they are applying it currently. We also wanted to find out just how much of their current practice aligns with the design thinking process. This we will first cover in the report under the section *What are primary school teachers doing already?*. Within this section we will examine a series of common values that emerged, to make visible what our participants are striving for in their teacher practice.

From here we then queried the teachers on their familiarity with the design thinking process to find out if design thinking is a familiar concept in primary schools and if teachers explicitly use the process in their teaching practice. The purpose of this questioning was to compare what teachers were already doing that can be considered “design thinking” with their explicit understanding of the design thinking process itself. Via this questioning the aim is to reveal the potential knowledge gap of primary school teachers as well as to draw attention to the connection between their current innovative goals with the goals of design thinking. The results on this are covered in the following section, *How does Design Thinking align with Best Practices & Build on Current Practices?*.

With a better understanding of best and innovative practices according to primary school teachers, and their familiarity with design thinking, we then wanted to uncover what obstacles they face, that inhibit them from making the steps towards their innovation goals. From our inquiry a clear set of common obstacles emerged. We examine each one under the section, *What obstacles Inhibit Innovation Goals of Primary School Teachers?*. By asking these questions we gained insight into what issues teachers are struggling with in primary schools, how such issues might negatively impact the pursuit of innovative goals and thus, prevent teachers from testing and adopting new tools, like the D-TIPS Toolbox.



Once we were able to outline what teachers were striving towards as “best practice” and what obstacles inhibit them, we were able to gain a better understanding of the needs of primary school teachers. In this context, “needs” specifically refers to what issues teachers are experiencing that drive them to seek out new tools and methods or inform their choices when exploring new tools/methods. From our research a series of clear “needs” emerged, that were expressed by the participants as needing to be addressed within the D-TIPS Toolbox. Each of these needs are covered under the section, *How can the D-TIPS Toolbox can address the needs of Primary School Teachers?*

Research Findings

What are primary school teachers doing already?

In this section D-TIPS will cover what best and innovative practices the participants expressed as being the most important to them, and what they either strive towards and implement in their classrooms.

Student-Centered Learning

When asked to define what innovative teaching meant to them and how it looked in their school, many responses aligned with the defined notions of best practice, confirming that teachers were interested and striving towards current innovative practices. At the center of the conversation, was student-centered learning and student-directed learning. Teachers expressed, with clarity, the importance of this...

"Let the children be the owner of their learning process."

"Student-centered practices that prepare them to succeed in the 21st Century."

"Teaching through 'active learning' where children are involved in the building of their instruction."

Teachers in Belgium are putting such goals into action by actively practicing in their schools;

"...our pedagogical method comes from the children's input, their needs and desires. As a result, my daily life is based on improvisation since we let the children make proposals."

Other mentions included the use of the '[flipped classroom](#)' [11] where students learn content online at home and then engage with their learning in group activities at school; and '[peer teaching](#)' [12] strategies,



where students research a topic themselves that they then teach to their peers, or have other pupils explaining new concepts to their peers in a way that is easier to understand.

Teacher as Facilitator

In addition, teachers in Belgium and the Netherlands valued the importance of redefining the role of the teacher, as rather a guide or facilitator;

“Practices where the roles of children and teachers have changed. The child must be at the centre of the learning process and the teacher must guide or accompany them.”

Technology

Teachers from Lithuania and the Netherlands shared experiences of their schools embracing technology, such as robotics and online platforms like ‘[Eduka](#)’ [13] & ‘[Squla](#)’ [14]). These tools are used to integrate subject areas to solve problems collaboratively, learn digital competencies like programming, and to personalise learning for their students.

Cross-Disciplinary & Integrated Learning

In addition, there was significant interest in cross-disciplinary and integrated learning, with many teachers sharing experiences or expressing interest in this approach. Teachers in Spain spoke of their experience with ‘makerspaces’ in their schools, where students are taught design thinking and computational thinking and are then presented with real and relevant complex problems to solve.

“I like it because you pose a challenge to them, you present a problem to the students, and they have to create, prototype, etc. They are in touch with more realistic things from society.”



Emotional Intelligence & Active Citizenship

Significant emphasis, from teachers, was also placed on designing learning experiences that develop emotional intelligences, empathy and active citizenship. Under this umbrella, teachers used many varying descriptions. Examples include: autonomy, self-management, interpersonal relationships, “resolving without getting frustrated”, respect & tolerance, self-efficacy, self-confidence and “education through volunteering”. Many of the teachers expressed an active engagement with developing these skills, through conversation, reflection and teamwork.

“Every morning students participate in ‘self-education’ lessons. During the lesson students share their thoughts about the day, learn how to manage their emotions, recognise emotions and feelings – his / her own and others, learn how to communicate with each other, how to deal with problems.”

From our participants, we were able to gain valuable insight into what “best practice” looks like, both in the minds and visions of our primary school teachers, and how these visions are being activated in primary schools. These insights also indicated to us that the broader, global trends and goals of innovation in education are very much in alignment with that primary school teachers are often doing, right now, in our local communities.

How does Design Thinking align with best practices and build on current practices?

“As educators, you are already designing every single day—whether it’s finding new ways to teach content more effectively, using your classroom space differently, developing new

approaches to connecting with parents, or creating new solutions for your school.”

- from *Design Thinking of Educators* (2012) [15]

Gaining insight into teachers definitions of best and current innovative practices further validates the relevancy of design thinking as a legitimate and relevant tool for primary school teachers. The language and experiences of teachers clearly indicates that they are already engaged in many design thinking processes and attitudes. Despite this, when we asked our teachers if they were familiar with design thinking, the largest proportion of teachers did not have prior knowledge, followed by the remaining majority of teachers who did know about design thinking but only used it occasionally or not at all (see fig. 1).

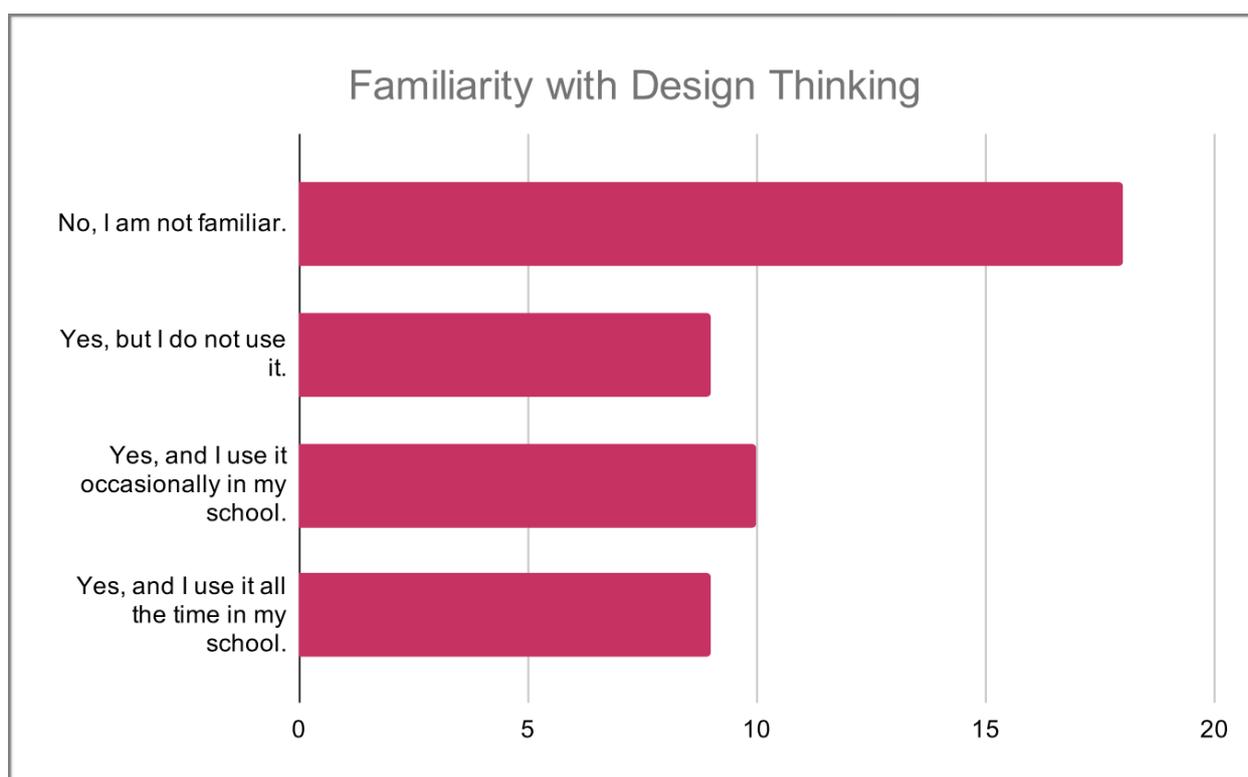


Figure 1. *Familiarity with Design Thinking*

As an added interest, we also asked teachers to organise a variety of “best practices” into categories named “Explicit Learning”, “Implicit Learning” and “Implicit and Explicit Learning”. The purpose of this task was to discover what best practices teachers believed their students

would learn naturally through other teaching moments and activities, as opposed to explicitly teaching these skills (see fig. 2).

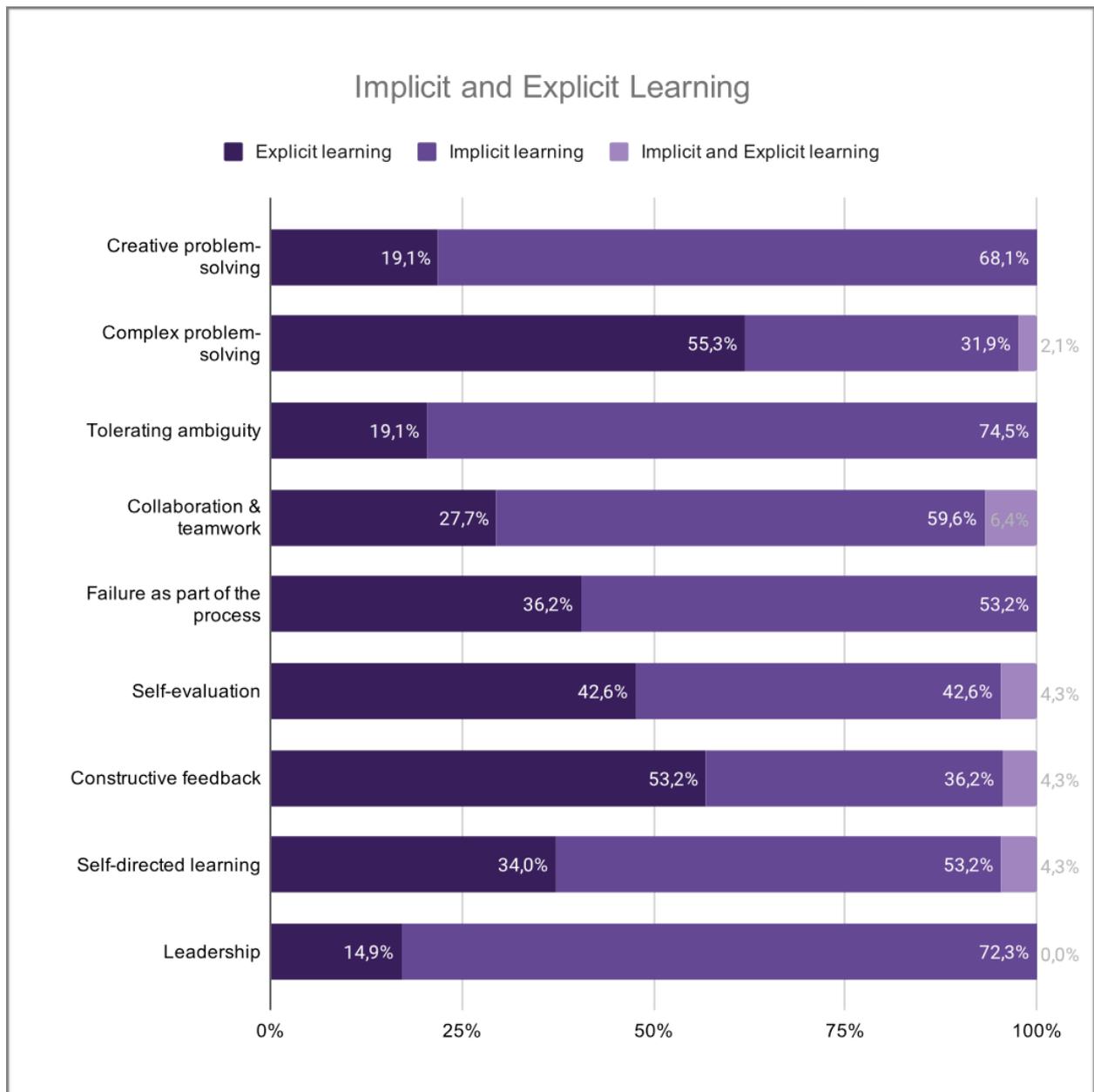


Figure 2. *Implicit and Explicit Learning*

By asking these questions we are able to get an idea of what “best practices” teachers might find harder to teach explicitly, or see as needing to be taught explicitly. The most popular practices that teachers feel are taught implicitly, relate to many of the soft skills (i.e.: “failure as part of the process”, “creative problem solving”, “leadership”, “tolerating ambiguity”) that the design thinking process tackles, but are not typically emphasised or monitored through assessment frameworks.



These results yield multiple avenues for testing the D-TIPS Toolbox in primary schools. For teachers who are not familiar with design thinking, this gap reveals an opportunity for design thinking to potentially enhance what innovative practices they are already doing. For teachers who do use design thinking, there is the potential to develop a toolbox that brings design thinking concepts and recipes into the specific context of primary schools.

What Obstacles Inhibit Innovational Goals of Primary School Teachers?

While it is important to have a clear picture of what primary school teachers are striving towards, it is crucial to uncover the obstacles and barriers primary school teachers are faced with that slow down or prevent new strategies and tools from being adopted in their schools.

A recent [publication](#) (2018) published by the Christensen Institute [16], introduces their theory called the “Jobs to be Done” framework, with the aim of shedding light on what the “push and pull” mechanisms are that cause (and prevent) teachers to adopt new instructional methods.

“We believe one key reason most school-improvement initiatives struggle to gain traction is that they are coercive. Rather than attending to what teachers demand, these initiatives tend to tell teachers what they need. The field has not sought to understand the actual progress that teachers are already trying to make, both in their own lives and in the lives of their students.” (p.5)

By gathering experiences from hundreds of teachers, researchers were able to develop a framework to better understand the forces that



motivate teachers to seek new instructional methods or discourage teachers from adopting new methods.

To focus, for now, on what prevents or discourages teachers from testing and/or adopting new methods, this brief explanation into the underlying “forces hindering progress”, as it’s referred to, can be considered as a backdrop to the more tangible explanations uncovered in our own research;

“The first [force] is the anxiety of the new solution. As people consider a new solution, they start thinking about all the things they might not be able to accomplish with it. That anxiety—that fear of the unknown—deters people from adopting a new solution. The second force acting against a switch is the habit of the present. The thought of switching to a new solution is almost too overwhelming. Sticking with the “devil you know,” even if imperfect, feels safer.” (p.10)

The participants involved in our research come from diverse European countries with varying political structures, socio-economic conditions, educational goals, attitudes towards learning and school cultures. Considering this, we asked similar questions around this topic, but from a range of different angles, to get a comprehensive view of what teachers felt were preventing them the most, from taking an interest in and/or adopting new instructional methods.

First, we enquired by asking teachers to rate a range of topical issues, as being a ‘significant obstacle’ at the top, down to ‘not an obstacle’ at the bottom. You can see the results in the following graph.

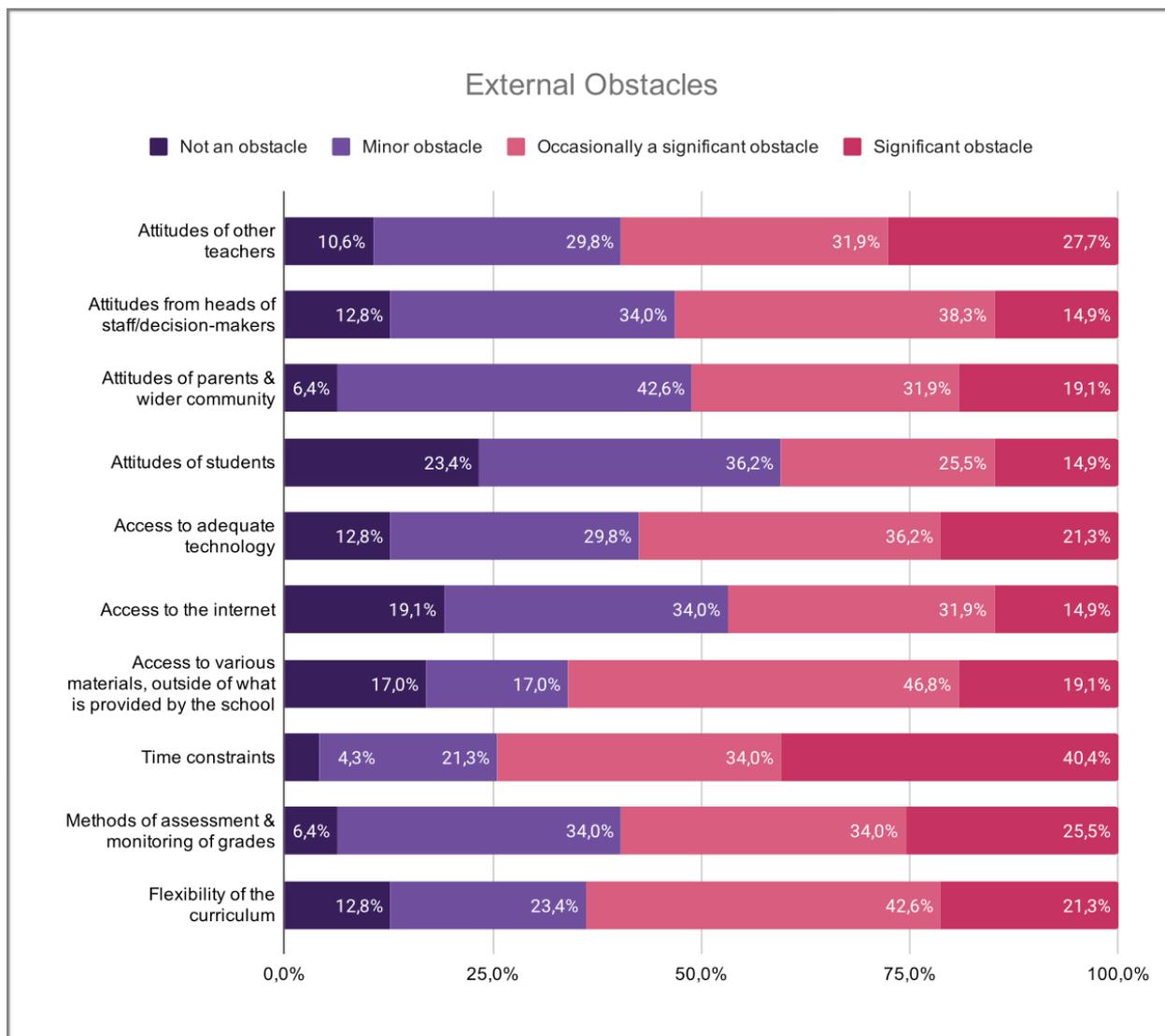


Figure 3. *External Obstacles*

The issues that were defined by the majority of teachers as being a ‘significant obstacle’ or ‘occasionally a significant obstacle’, are “time constraints”, “attitudes of school leaders & decision makers” and “access to materials outside of school”, followed by “methods of assessment” and “flexibility of curriculum”.

Interestingly, when we asked teachers to elaborate by asking what other issues prevented them from adopting a new tool or method. It was here that the ‘lack of time’ issue was mentioned an additional 11 times, making it very clear that teachers feel very time-pressured, and therefore are often either reluctant or highly selective about what they choose to give time to.

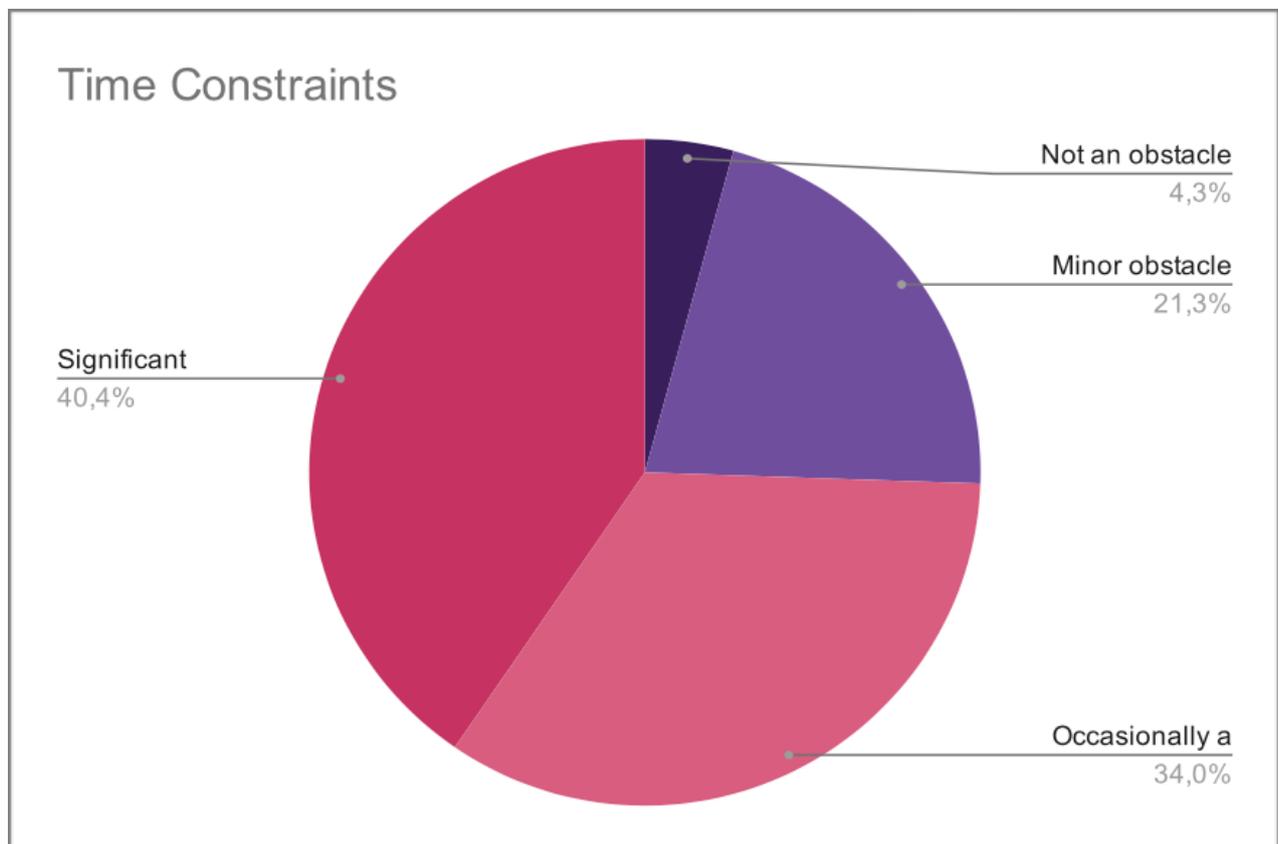


Figure 4. External Obstacles: Time Constraints

Their answers also provided insight into what we felt they wanted more time to do. These included: time to plan & reflect with their colleagues as a team, time to take further training, time spent with students, time to test & experiment, and time to research.

Other comments of interest that were made included a lack of motivation, varying class sizes and learning styles, the anxiety of leaving your comfort zone and a lack of access to training opportunities.

During the interview process we were then able to take note and go deeper with many of the issues that were touched on in the questionnaire, with teachers elaborating further by sharing their experiences. Of the 12 interviews we were able to distill their experiences in 3 major categories.

Time

With time being the most frequently mentioned concern we still start here. While not all teachers claimed that this was an obstacle for them,



almost all teachers did, at the very least, acknowledge that it was an issue that teachers in their schools faced, as both a physical and/or psychological barrier.

Teachers reported that time constraints often makes them feel like their “plate is full”, limiting their ability to be curious, to explore and test new methods. One teacher from Brussels reports that the teachers at her school feel like they are “already doing enough” and are “overwhelmed”;

“... And it seems like they'll get frustrated if they have to try something new.”

A teacher from Lithuania says they feel the time constraints force them to choose between trying out new ideas and teaching to the curriculum;

“The hardest part is to choose your priorities, because there is a limited time to learn everything that is included in the curriculum.”

A teacher from Romania says that the administrative demands of their school means they have little time for reflecting and improving their methods;

“Bureaucracy... the papers are too much, many are useless...[It] takes too much time to complete papers on unnecessary activities, not on things that really matter, for example, personal development...”

In the Netherlands, one teacher understands that while they may be interested in new methods, many teachers cannot afford to sacrifice their free time;



"I'm enthusiastic so I would sometimes sacrifice my weekend to take a look at a new method and develop some exercises or lessons around it. But I also understand when other colleagues are really strict in saying 'I don't work for free'."

These insights shed light on the many ways that the "lack of time" manifests for teachers. It seems that unless the new method/tool is something that is implemented by school authorities with time allocated, many teachers are reluctant to take the initiative to try new methods or tools - not just because they don't want to, but because they cannot allocate the time they need to do so.

Attitudes & Culture Within the School

As mentioned earlier, time constraints can be both a physical and psychological barrier, with feelings of being overwhelmed sometimes being conflated with not having enough time. Teachers struggle to keep up with the administrative demands from the school, while at the same time crave longer periods of time to connect and create a natural workflow with students. It is typically the attitudes of school leaders and fellow colleagues that dictate the culture within a school environment, determining what the priorities are for teachers, and whether they feel supported. Teachers from Brussels and the Netherlands report that even though they feel supported in their school to test out new methods, it can be logistically slow and time-consuming;

"...this process involves many actors, and the adoption of a new method such as this one must be uniform throughout the school, validated by the team and the principal."

"I would love to be able to update the curriculum, but it takes the whole school, not just one person to do so."



In other instances, teachers may be given the freedom to interpret the curriculum, but are not given the support or guidance to do so;

“...the new [school] objectives gives teachers much more freedom, but it also makes us very insecure because we're not sure if we're going to meet them well...”

And in some schools, teachers are finding that the attitudes of their colleagues can be discouraging when testing out new methods;

“The headmistress is very open, it's easy to suggest innovative practices but it is quite difficult with colleagues...I was shocked to see that some teachers still don't know how to embrace creativity. Children in the early grades are very creative, have different perspectives and are open to experimentation, but some teachers are narrow-minded and accept only one right answer. So, it creates an issue in which teachers...sometimes do not know why they teach what they teach.”

As any teacher would agree, having an interest in adopting new methods is easy, but the reality of navigating the attitudes and logistical processes within the school can often discourage teachers from testing out new methods.

Access to Materials & Technology

Access to materials and technology varies widely from country to country and even from school to school. Despite the demand for digital literacy, many schools struggle financially, to supply a sufficient amount of varied materials and technological tools. As one teacher in Brussels says when discussing the problem of accessing technology;

“The school has a project to buy tablets that rotate from class to class or to set up a computer room, but it will take time because of the financial cost.”



Other schools may have access to technology, but instead lack materials that are relevant for their needs and can be adapted to their language and community. As a teacher from Lithuania states;

“There [are] few interactive tools in Lithuanian language and / or content that can be adapted to the primary class. For example, material on a topic like “Middle Ages in Lithuania”. Also, existing material[s] [are] usually...outdated. Also, there are a lot of materials for testing the skills of students, but not so much for interactive presentation[s] of the exact content.”

For some teachers, the reality is that they struggle to get any relevant or stimulating materials. As one primary school teacher from Romania states;

“We only have the textbook, nothing else, in any curricular area...[I] would love to have tactile materials that kids and teachers alike can touch, feel, do things with, not just read.”

Although most teachers are striving towards many similar goals in best and innovative practices, most teachers must try to work around many different barriers that prevent or slow-down innovation in their schools.

How can we address these obstacles when designing the D-TIPS Toolbox?

Earlier we referred to the “forces hindering progress” that might prevent teachers from changing their practice, so now let’s look at the “forces enabling progress”, according to the Christensen Institute report;



“There is the push of the situation—the moments of struggle that cause someone to want to take action. The push of the current situation is about what is taking place in someone’s life to cause him to feel he needs to change and make some progress differently. The second force is the pull of a new solution to satisfy the Job to be Done. Without this, people will stay on a treadmill—thinking that they must do something different, but not acting. That new solution must be enticing. It must create some magnetism and allure, so people can see how it can improve their lives.”(p.9)

By getting a clear picture of what teachers are already striving towards and what barriers they face in achieving their goals, we are able to begin to understand the need; that is, what motivates teachers to adopt new tools, methods or approaches.

While we were able to identify the needs of teachers based on the evidence we shared above, almost all of them were able to articulate what they needed as well. This serves to further reinforce our findings and help us develop a more informed brief that we can take forward into the design of the D-TIPS Toolbox.

During the interview process, a series of clear needs emerged as being the most important for teachers.

Easy to Start

As explored earlier, teachers often feel time-constrained, and this is experienced in a number of different ways. Teachers feel overwhelmed, preoccupied with administrative tasks, they feel like it takes too long to rally support from their school and/or colleagues or that there isn’t enough time to devote to learning anything new. Basically, teachers are reluctant to pick up tools that seem time-consuming. For these reasons it is important that the D-TIPS Toolbox is designed in a way that anyone can



pick-up, understand and use easily, without a lot of preliminary theory, training or preparation.

“It would be great if this toolbox would help me in such a way that I don’t have to develop a Design Thinking lesson or activity on my own on a Sunday afternoon.”

Easy to Scale

As we all know, school environments are always evolving and adapting. Classes regularly change and vary in size, some classes are organised into learning abilities and styles. For this reason, teachers need tools whose efficacy doesn’t rely on specific numbers of children or adults, and is relevant and engaging to different age groups.

Similarly, the length of lessons and the structures of curricula vary from school to school. Some schools are more flexible and dynamic with how the days and months are planned, whilst other schools stick to a very uniform and regimented learning plan. This is why scalability must also be considered when designing the tools so that they are usable regardless of the length of the project, lesson or activity.

Explicit Link to the Curriculum

This need is important for teachers, not only for their own teaching practice, but also for credibility and relevance when trying to gain the support of fellow colleagues and school leaders. Teachers stressed that making clear, explicit links to key competencies will make it easy to incorporate into existing planning, and convince their colleagues of the value of the tool in fulfilling these competencies. It will also make the value of a design thinking toolbox self-evident, so it is able to “speak for itself”. Linking the national curricula objectives of our piloting countries directly with design thinking principles will make it even easier for teachers to see the value of the D-TIPS Toolbox.



Adaptable

An important component of 'self-evidencing' the value of the D-TIPS Toolbox is to make it clear to teachers that design thinking should not be taught as a subject in itself, but viewed and applied as a process that enhances teaching **across all disciplines**.

"...it should be considered as a method/tool that enhances the teaching of all subjects. It is a tool that should be used to achieve another goal."

It needs to be explicit that the D-TIPS Toolbox is not to be used as a replacement for other activities but is instead to be used to enhance the activities and projects that are already in action. The toolbox needs to be presented as guidance or "recipes" for using design thinking to invite open-ended and collaborative learning experiences across classrooms, subject areas, cultures and learning abilities.

"Activate me to create my own combinations and lessons from your toolkit."

Teachers also emphasised that the D-TIPS Toolbox needs to be adapted to the native languages of our piloting countries. The current challenge of many non-english speaking countries, is that many resources and tools that are already out there, are difficult or impossible to use simply because of the language barrier. For this reason it is important to try to offer the toolbox in multiple languages to ensure that our piloting countries are not confronted with the challenge of translating the content themselves.

Adds Value & Opportunities for Development

While it is important that the D-TIPS Toolbox speaks to the goals of schools as a whole, it is equally important to evidence how it will add



value to teachers lives on an individual level. Teachers are constantly inundated with the latest trends, tools, methods and mindsets. As teachers wade through all the different tools and methods that are advertised to them, they are on the lookout for something that immediately grabs them as something stimulating or inspiring, where they can clearly see an opportunity to develop.

"...When an external expert who has experience with a method and with education comes into our school, the knowledge and experience stick best and people are convinced easier."

The D-TIPS Toolbox should help teachers to clarify their goals and make sense of why they do what they do. The toolbox should represent and deliver in a way that inspires teachers into action, and not just something that does the thinking for them.

Access to a Variety of Materials & Resources

From our research it is evident that access to the internet and technology is dependent on many different factors including, financial, cultural, regional and educational. In addition, all teachers have different preferences for different types of materials, both online and offline, depending on who and what they are teaching. To illustrate, here are some responses from the teachers;

In Lithuania:

"Lesson examples specific to topics, additional material related to the national content....Not only examples of tests, but interactive material that can be used during the lessons."

In Spain:

"I think it would be useful to do it in digital format for several reasons: The students are much more motivated (the text is better



on the screen than on paper, even if it is the same) and for accessibility...papers can be stored... [but] they can be lost, they are not used. Better if everything is virtual to make it easier to use."

In the Netherlands:

"I understand it's easy to have a complete online module, but it doesn't activate me. I find it too passive to just follow online steps on a smartboard."

In Romania:

"[I prefer] offline or combination, online is the last option, because it is not adapted to the level of my kids."

From these responses it is clear that there is a need to provide a range of different ways and means for teachers to access the D-TIPS Toolbox and the materials provided in it. To investigate this further we also asked teachers to rate different types of resources that they use in the classroom according to how important it was for them to teach.

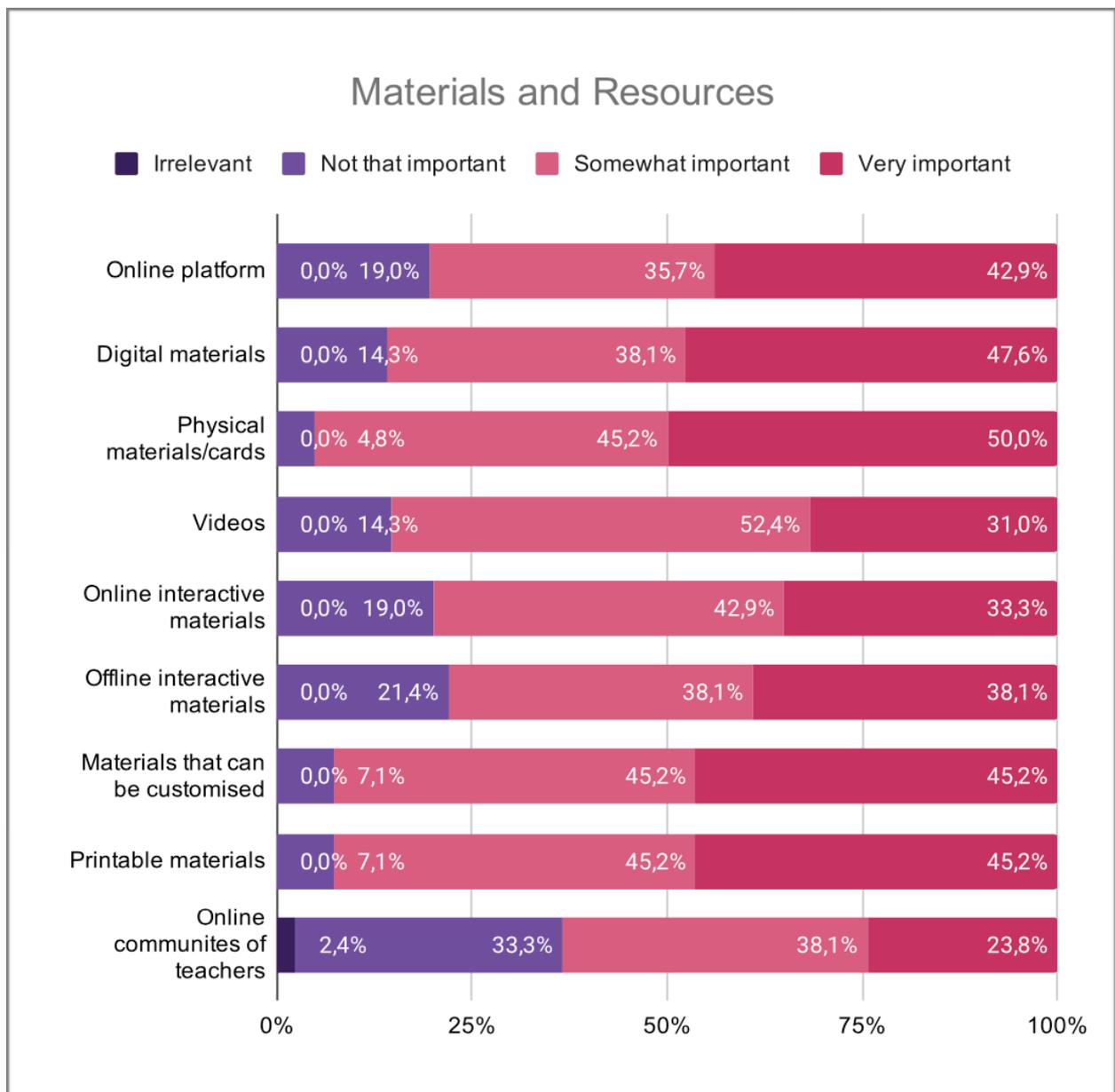


Figure 5. *Materials and Resources*

The results (see fig. 5) concluded that resources considered to be “very important” were physical materials, followed by digital and printable materials. Resources that were considered “somewhat important” were customisable materials, followed by videos and online interactive materials.

The findings present a clear need for a diverse range of different resources that teachers can pick and choose. There needs to be offline access to all of the resources, with printable materials and options for teachers to customise materials to suit the needs and focus of the



students. In addition, teachers value concrete examples of lessons and activities to easily understand how to apply the design thinking tools. By having a variety of different types of resources teachers can access and use the D-TIPS Toolbox like a box of different ingredients that they can combine to create a bespoke lesson or project.

What are the next steps?

From the research gathered we can conclude that the Design Thinking process is a highly relevant and legitimate process that can be used to enhance the learning of children and the practice of teachers. The D-TIPS toolbox will not only support and add to their current practice, but also provide opportunities to develop and innovate their teaching practices, as teachers continue to strive towards the 21st century learning goals and innovative pedagogical frameworks.

D-TIPS has been able to ascertain several key findings that will be indispensable when we design and pilot the D-TIPS toolbox in the coming months. Of the conclusions drawn in the report, the key findings are as follows:

- Primary school teachers in Europe recognise and are actively striving towards 21st century learning goals and attitudes, and engaging with several innovative practices that focus on student-centered and directed learning, digital literacy and technological engagement, creative and complex problem-solving, integrated and collaborative learning and cross-disciplinary projects.
- Design Thinking aligns with many of the 21st century goals, and current innovative practices of teachers, but is not a familiar concept among teachers in most schools. This finding reveals the potential for



teachers to not only include design thinking in their current practice, but to also extend and develop their competencies further.

- Primary school teachers face many obstacles that slow down and prevent innovative practices from gaining traction in their schools and communities. Many schools do not prioritise experimentation and testing new methods, and many teachers struggle to find the time in their own schedule to test and experiment in their classrooms. These factors affect the attitudes and cultures of schools, making it challenging to try new methods.
- Through a better understanding of what challenges teachers face, D-TIPS is able to uncover their needs and what factors can motivate teachers to test out new tools and methods.

The most significant factors that we will refer to in the design of the D-TIPS Toolbox are:

- the ease with which to start using the D-TIPS toolbox.
- the ability to scale the D-TIPS toolbox to fit different sized classes, age groups and projects.
- clear links to the national curricula.
- flexible tools that invite collaboration and work easily across subject areas and learning abilities.
- translations in native languages of pilot countries.
- development and training opportunities for teachers.
- a diverse range of online and offline materials and resources.

With these findings as our departure point D-TIPS aims to design and implement a toolbox for Primary School teachers that puts children, with the guidance of teachers, in the driver’s seat of their own learning journey from an early age. The design thinking process within an educational environment provides a framework for children to engage in complex and creative real-world problem solving, and inquiry-driven

learning that is open-ended, fun and collaborative. With the valuable information provided from our participating teachers we want the D-TIPS toolbox to speak to the core of what inspires and activates teachers, but is flexible enough to navigate the current challenges of the teaching profession.



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The D-TIPS Consortium

newschool Newschool

Newschool is an education design agency in Norway, combining research, innovation and learning design to redefine learning spaces and provide training to educators and leaders. They design courses that empower leaders to build change teams, inspire, and become engaging, creative and disruptive innovators in education. For the D-TIPS project, Newschool is responsible for research and reporting, the coordination of workshops for teachers and the dissemination of results among teachers and stakeholders in Norway and Romania.



Universitat Pompeu Fabra

Universitat Pompeu Fabra (UPF) is a public university in Barcelona, founded in 1990, that stands out for its quality in teaching, research, and international outreach. In this project UPF participates through the Interactive and Distributed Technologies for Education group (TIDE), a part of the Engineering School of UPF. TIDE-UPF is the coordinator of the D-TIPS project and leads the design and development of the D-TIPS Toolbox online platform. TIDE is also in charge of the organization of pilots in schools, organization of the Spanish symposium for teachers (February 2021) and a final Multiplier event in Barcelona (June 2022).



Knowledge Economy Forum

Knowledge Economy Forum (KEF) is a professional non-profit, located in Vilnius, Lithuania, with more than 50 members representing research, innovation



and education areas. KEF brings together politicians, researchers, industry experts and citizens, and acts as a debate platform for country's societal and economical progress. In the D-TIPS project KEF will be involved in piloting, training and disseminating project results among teachers and other stakeholders in Lithuania, and also will lead the valorisation and sustainability activities of the project.



Strategic Design Scenarios

Strategic Design Scenarios (SDS) is a design agency and sustainability innovation lab based in Brussels (Belgium) focusing on sustainable living, collaborative services, design for behavioral change and design for social and public innovation. The SDS team is often in the field conducting participatory action-research, scenarios building, co-designing with users and offering training activities. In D-TIPS, SDS contributes to the design of the D-TIPS toolbox and platform through a user-friendly approach and is also actively involved in the testing, training and dissemination of the project outcomes among teachers and other stakeholders in Belgium.



Teach The Future

Prepare students for tomorrow, teach the future today! Teach the Future believes that young people of any age can learn to think critically and creatively about the future and develop the agency to influence it. By teaching the future we equip youngsters to face uncertainty and empower them to envision and create their preferred future. Design thinking is needed to be able to imagine the future. As partners in this Teach the Future will link design thinking with future empowerment.

Design Thinking (D-TIPS) for Primary Schools

The questionnaire may take around 7 minutes to complete and is related to an upcoming lesson on the science of learning.

Your response to the questionnaire will be anonymized prior to analysis. This data is collected in the context of the Erasmus + project DTIPS (see: <http://bit.ly/DTIPSproject>), in partnership with several partners across Europe, including the Netherlands, Lithuania, Spain, Norway & Belgium. Our goal is to develop a practical design thinking toolbox for primary school teachers, with the purpose of bringing children into the design process of their own learning. Your input is vital in helping us to develop a toolbox that is relevant, practical and inspiring to Primary Schools.

If you have any questions or concerns about the data being collected, please contact: patricia.santos@upf.edu (project manager) or mihaela@newschool.me (local partner in Norway), christophe@strategicdesignscenarios.net (partner in Belgium), gintare.zi@zef.lt (partner in Lithuania), erica@teachthefuture.org (partner in Netherlands).

1. This questionnaire is anonymous. We would however like to compare results across several questionnaires. If you agree to that, please write a unique 5 digit code that we can use as identifier (e.g. 5 first numbers of an ID card).

A little about you.

Please provide some information on you & your teaching background:

2. How long have you been teaching for?

Markér bare én oval.

- Less than 2 years
- 2-5 years
- 5 -10 years
- More than 10 years

3. What type of school do you work in?

Markér bare én oval.

- State funded school
- Privately funded school
- Not applicable
- Andre: _____



BEST (INNOVATIVE) PRACTICES

Innovative practices aligned with the design thinking process

4. What would you define as innovative teaching practices?

5. Which of the following skills /attitudes do you teach explicitly (direct instruction), and which are acquired through implicit learning (through practice, in the absence of conscious awareness of what has been learned)?

Merk av for alt som passer

	Explicit teaching	Implicit learning
Creative problem-solving	<input type="checkbox"/>	<input type="checkbox"/>
Complex problem-solving	<input type="checkbox"/>	<input type="checkbox"/>
Tolerating ambiguity	<input type="checkbox"/>	<input type="checkbox"/>
collaboration & teamwork	<input type="checkbox"/>	<input type="checkbox"/>
failure as part of the process	<input type="checkbox"/>	<input type="checkbox"/>
self-evaluation	<input type="checkbox"/>	<input type="checkbox"/>
constructive feedback	<input type="checkbox"/>	<input type="checkbox"/>
self-directed learning	<input type="checkbox"/>	<input type="checkbox"/>
leadership	<input type="checkbox"/>	<input type="checkbox"/>

6. What other generic skills (not specific to any discipline), or essential attitudes do you particularly find interesting to work with ?

Have you heard of Design Thinking before?

What is Design Thinking?

Design Thinking is a mindset.

Design thinking is about believing we can make a difference, and having an intentional process in order to get to new, relevant solutions that create positive impact.

Design Thinking gives you faith in your creative abilities and a process for transforming difficult challenges into opportunities for design.

It's Human-Centered. Design Thinking begins from deep empathy and understanding of needs and motivations of people—in this case, the students, teachers, parents, staff and administrators who make up your everyday world.

It's Collaborative. Several great minds are always stronger when solving a challenge than just one. Design Thinking benefits greatly from the views of multiple perspectives, and others' creativity bolstering your own.

It's Optimistic. Design Thinking is the fundamental belief that we all can create change—no matter how big a problem, how little time or how small a budget. No matter what constraints exist around you, designing can be an enjoyable process.

It's Experimental. Design Thinking gives you permission to fail and to learn from your mistakes, because you come up with new ideas, get feedback on them, then iterate. Given the range of needs your students have, your work will never be finished or "solved." It is always in progress. Yet there is an underlying expectation that educators must strive for perfection, that they may not make mistakes, that they should always be flawless role models. This kind of expectation makes it hard to take risks. It limits the possibilities to create more radical change. But educators need to experiment, too, and Design Thinking is all about learning by doing.

In short, Design Thinking is the confidence that new, better things are possible and that you can make them happen. And that kind of optimism is well-needed in education.

Here is a short video about it



<http://youtube.com/watch?v=ldYzbVONDp8>

7. Are you already familiar with Design Thinking?

Merk av for alt som passer

- Yes, and I use it all the time in my school.
- Yes, and I use it occasionally in my school.
- Yes, but I do not use it.
- No, I am not familiar.

What Design Thinking looks like in practice

The design process is what puts Design Thinking into action.

It's a structured approach to generating and developing ideas.

The five phases of the design process:



8. To what extent do you involve pupils in deciding which way the lesson will go? Please indicate the depth of their involvement in the decision making.

Markér bare én oval.

1 2 3 4 5 6 7 8 9 10

Little/no involvement Student-lead planning and learning

9. How often do you involve pupils in deciding which way the lesson will go? Please indicate the frequency in which they are involved.

Markér bare én oval.

1 2 3 4 5 6 7 8 9 10

Once a week or less Several times throughout the day

NEEDS

Drivers to seek out new tools/methods to improve teaching.



10. What are the most common (external) obstacles when implementing new methods or practices in your school?

Markér bare én oval per rad

	Significant obstacle	Occasionally a significant obstacle	Minor obstacle	Not an obstacle
Attitudes of other teachers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attitudes from heads of staff/decision-makers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attitudes of parents & wider community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attitudes of students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to adequate technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to the internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to various materials, outside of what is provided by the school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time constraints	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Methods of assessment & monitoring of grades	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flexibility of the curriculum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. Are there any other obstacles that were not mentioned above? If so, please identify what they are:

12. What prevents you, personally, from adopting or testing a new tool/method? Explain:



TOOLS

Tools to support teaching practices

13. When designing a lesson or curriculum, what aids do you use to assist you?

Markér bare én oval per rad

	Very important	Somewhat important	Not that important	Irrelevant
Online platform	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Digital materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical materials/cards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Videos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online interactive materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Offline interactive materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Materials that can be customised	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Printable materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online communities of teachers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

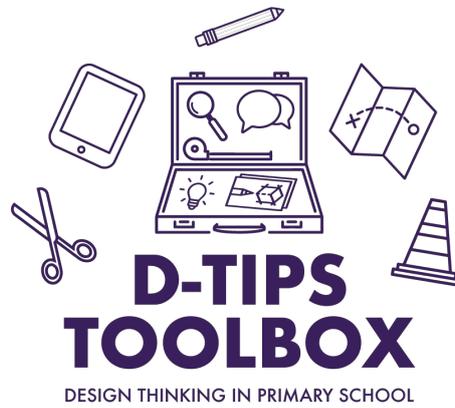
14. When you need inspiration for new tools or materials, where do you look ?

Markér bare én oval.

- toolsearch online
- online teacher communities
- chat with colleagues
- taking courses
- Andre: _____

Thank you!

Thank you for your contribution! If you would like to keep updated on the latest developments for DTIPS, please check out our website <https://www.dtips.eu/> and subscribe to the mailing list.



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This report: Addressing the Gaps & Needs of Primary School Teachers when Designing the D-TIPS Toolbox reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.