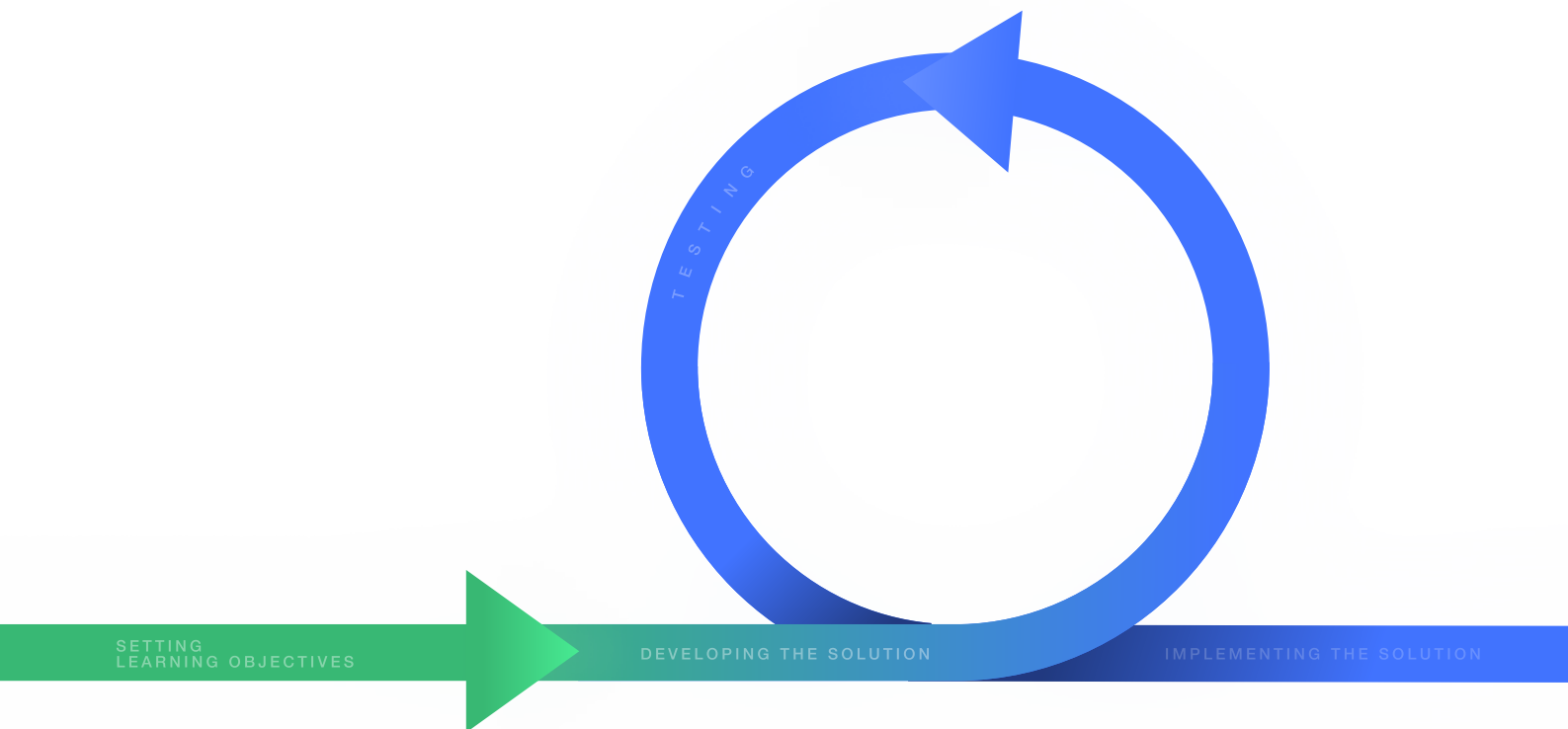




**Graduate School
of Management**
St. Petersburg University

Developing Digital Learning Solutions:

From Goal-Setting to Creating and
Implementing Digital Tools



Version 1.0
Saint Petersburg, 2022

Teaching Excellence Lab
at the Graduate School of Management, St. Petersburg University

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Letter from the Editor and Key Concepts

Implementing innovative solutions in a classic higher education environment has always been a challenge. Stable and time-proven, universities are often not ready to embrace new practices, seeing them as a threat to traditions, to the established order of things and sometimes even to their own existence.

This is what happened to the digital innovations that our team has been implementing at the Graduate School of Management at St. Petersburg University (GSOM SPbU). Having embarked on the digital transformation of the business school back in 2018, we proved to be better equipped for an emergency shift to distance learning. Was it plain sailing for GSOM SPbU? No, definitely not, but it was a loss-free transition. That was when we began to understand the two main prerequisites for a successful implementation of new digital solutions in a university: adjustment to the reality and needs of the learning process, multiplied by continuous user support, training and adaptation. In the end, things that are obvious for those involved in corporate innovations in business became lessons we all had to learn in practice.

Going back from distance learning to a transformed learning environment proved to be a learning ground for us as well. Our team was developing, testing and implementing from scratch a hybrid format of learning at GSOM SPbU. We have designed the technical configuration for hybrid classrooms and the teaching principles of holding hybrid classes. Find out more about our journey [on our website](#).

Developing and implementing new learning formats and relevant digital tools, we have come up with universal methods that can help design digital learning solutions for universities.

Our methods are based on the best design thinking practices adapted to learning, to the way universities work and to the challenges that higher education is facing today.

This document provides a high-level description of our methods and helps understand the logic behind our reasoning and the highlights of our approach to developing digital solutions. To gain a more comprehensive insight into our methods, to learn how these could be applied to your needs, and to get access to additional resources, join our special GSOM SPbU webinars. For more details, please go [here](#).

And yes, this is our version 1.0 so your feedback is welcome.

Thank you and let us stay in touch.

Alexander Bayzarov
Head of the writing team
Project director, VTB Bank



The Basics

These methods can help design a new learning experience in universities that draws on the specifics of teaching methodology in a digital environment (digital didactics) and the potential of today's digital tools.

Apply these methods if:

1. You are upgrading the teaching methodology at your university, i.e. developing new approaches to teaching in a digital environment (and realizing that the old methods are no longer efficient).
2. You are tackling the gap between the technological know-how of the IT department and the real learning needs.
3. You are launching digital transformation and want it to yield tangible results.

The main issue that our methods help solve: synchronizing the use of digital tools with learning (teaching) outcomes.

What is inside our methods: a standard procedure of developing digital learning solutions.

Where to start:

- ➔ **Build a cross-functional team** that will develop and implement the digital solution. It can include methodologists (or instructional designers), professors and IT specialists. Make sure that these people are genuinely set on delivering quality results and are not an "at-your-command" task force.
- ➔ **Study the methods.**
- ➔ **Join our webinars** and come to our hands-on training to adjust the methods to the way your university works and try to put it to practice. See upcoming events [here](#).

The principles behind our methods

The key task of the learning process is to achieve the learning outcomes formulated by the students and the instructor together.

Students should get equal learning opportunities regardless of the preferred learning format.

The potential of a digital environment should be harnessed **to foster students' agency**, through a personalized learning track among other things.

In a digital environment, methodology and technology are inextricably connected:

methodology generates a need for technical implementation whereas technical infrastructure sets the limits of what is possible.

Learning process should be data-driven while data analytics should become one of the key design elements of digital learning solutions.

A seamless digital learning environment is a benchmark for developing digital solutions when there is an oversupply of technology.

The efficiency of digital solutions should be measured at multiple levels: from achieving learning outcomes to concurrent conditions of economic viability and technical stability.

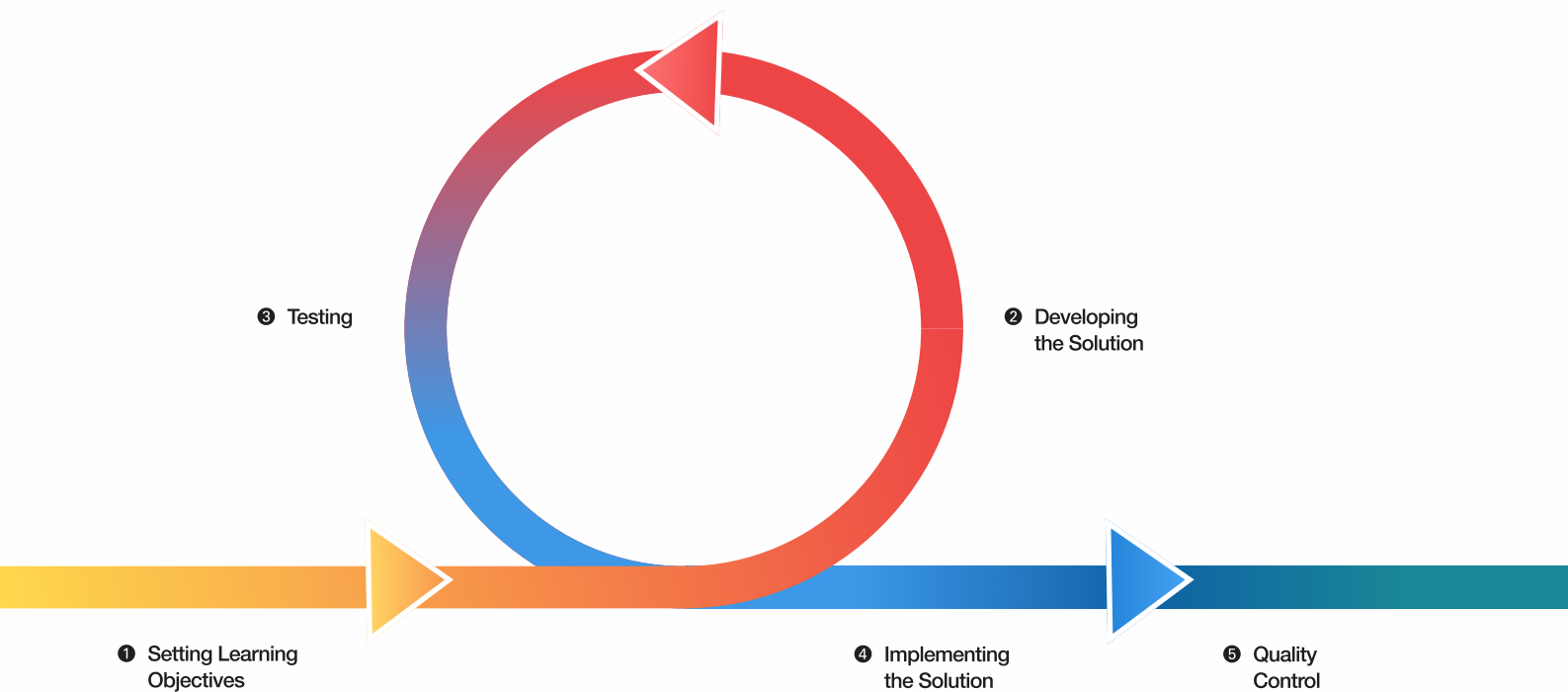
How Our Methods Work

The GSOM SPbU methods of developing digital learning solutions for higher education draw on design thinking principles. Product design practices have been expanded and adjusted to learning needs.

The GSOM SPbU methods rest on teaching methodology principles: a top-quality digital learning solution cannot be created without an understanding of teaching needs, learning outcomes and the science of learning.

The steps below constitute an exhaustive process that can be adjusted as and when needed.

Methodology steps



STAGE 1

Setting learning objectives

Formulating learning objectives and thoroughly studying the teaching context and the needs of professors and students. A deep understanding of the needs and “borderline conditions” will help better focus on development.

1. Defining the concepts
2. Selecting a teaching scenario
3. Identifying teaching needs
4. Specifying goals and metrics

STAGE 2

Developing the solution

Developing a comprehensive digital learning solution that encompasses learning experience (LX), a set of teaching principles, a digital environment and digital tools.

1. Producing a student journey map (SJM)
2. Developing methodological solutions
3. Formulating Jobs-To-Be-Done (JTBD)
4. Creating a digital environment: selecting digital tools for each task and synthesizing them into a seamless digital learning environment

STAGE 3

Testing

Once the concept is developed, we can proceed to the testing stage. The cycle of “prototyping – testing – improvement” is repeated until the set learning outcomes are reached.

Prototyping

1. Creating hypotheses and validation criteria
2. Building prototypes: from paper prototype to a full-scale test bed

Testing and improving

3. Testing hypotheses
4. Improving the solution

STAGE 4

Implementing the solution

The success of a new digital solution directly depends on the engagement of end users – professors and students. A new solution, however “ideal” it might be, is a serious challenge as it requires mastering new skills and adjusting all habitual actions when applying a new approach to learning objectives.

1. Motivating
2. Institutionalizing
3. Training instructors and students
4. Promoting through internal communication
5. Supporting at the start
6. Refining for specific tasks

STAGE 5

Quality control

During the first months it is crucial to perform quality control procedures. If the gap between the implementation objectives, functionality and the quality of user experience is critical, the solution should be improved.

1. Setting up digital analytics
2. Making manual observations
3. Improving the solution
4. Responding to incidents

STAGE 1

Setting Learning Objectives

When starting the process of designing a digital learning solution, we need to clearly define its “borderline conditions”: learning goals and objectives, a target audience and criteria to evaluate the effectiveness of the solution.

Defining the concepts

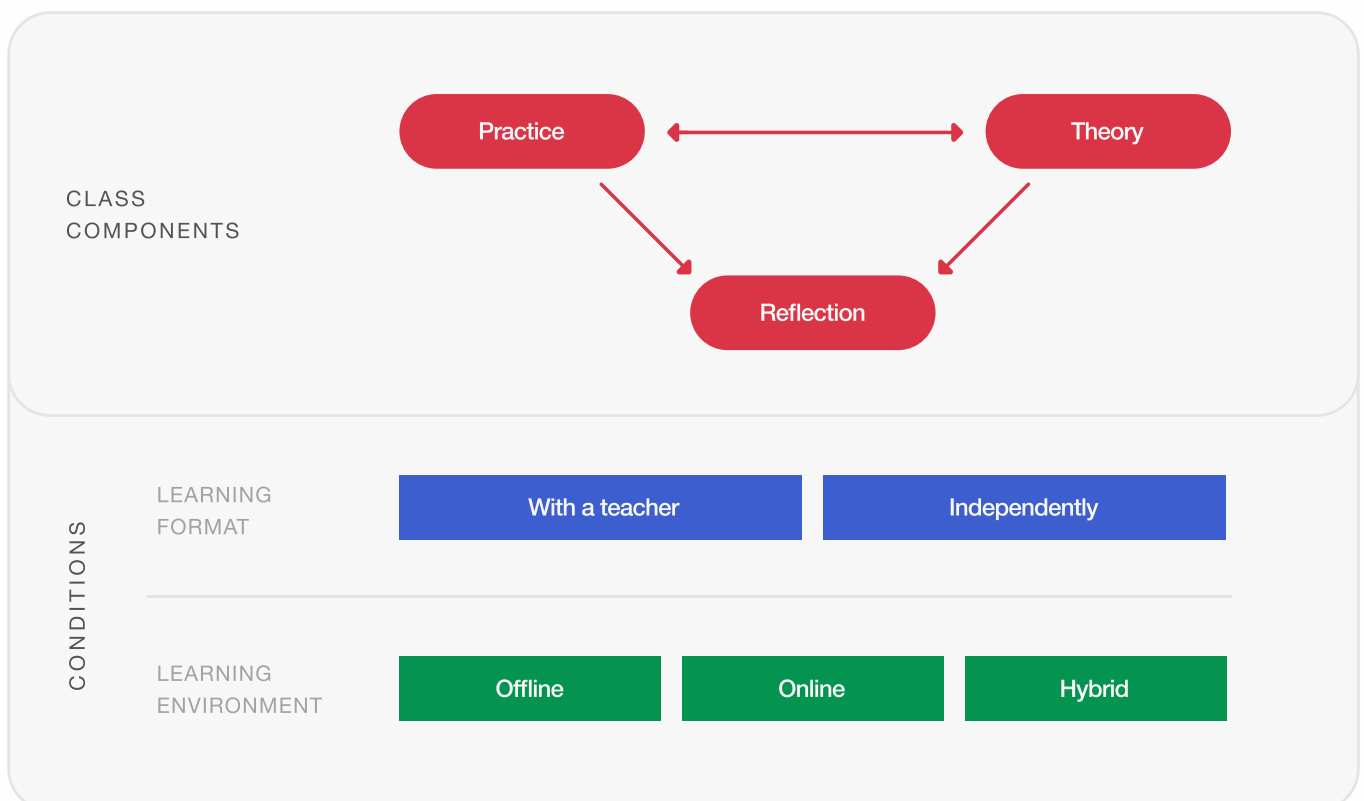
Speaking of learning in universities, we assume that the entire teaching tradition and practice can be defined as a set of teaching scenarios at the level of a class, a discipline and a program.

Let us now focus on developing a digital learning solution for teaching scenarios at a class level. In order to facilitate the understanding of a teaching scenario, we have analyzed various types of classes and identified two meta-goals: to pass on skills and direct experience, and to nurture understanding, create insights and encourage rethinking. The first category includes any hands-on training, from statistics and programming to sports training and painting classes. The second category includes any classroom training designed to form a worldview, e.g. understanding the logic behind the historical process, exploring how companies work, or looking into the structure of the psyche. Depending on the learning outcome for a particular class, we distinguish two meta-teaching scenarios.



The chart below shows a universal teaching scenario structure divided into three blocks: class components and conditions for their realization – learning format and learning environment.

Teaching scenario structure



Selecting a teaching scenario

Depending on the goal set by the university, digital learning solutions can be developed in a variety of ways.

If a systemic “restructuring” of methodology and teaching approaches is needed, then the first step should be to analyze the teaching tradition and practice, and to describe the entire “field” of the teaching scenarios in use, followed by their transformation and upgrade.

We recommend using the teaching scenario metachart built on universal learning outcomes (see on the previous page) as a basis for describing the teaching tradition and practice at a class level.

Once a system of the teaching scenarios in use at a university is established, one or more scenarios should be selected to further develop the digital learning solution.

Having explicitly formulated the learning outcomes and clearly set the boundaries of the teaching scenario to develop the digital learning solution, we can go straight to the next step.

Identifying teaching needs

With the teaching scenario already defined, the next step is to conduct a deep analysis of the methodological and teaching needs the instructors have during the class.

Broadly speaking, **teaching needs** are the needs of an instructor for the tools to execute a teaching scenario.

Elaborating the teaching needs within the selected teaching scenario includes **the following steps**:

1. Identifying a basic set of teaching needs from the available data on the learning process at the university and through trend analysis: what information do we already have to draw a list of needs?
2. Eliciting the needs from the professors: in what way is the teaching scenario realized and what do the professors need to successfully reproduce it?
3. Prioritizing and selecting: which needs should be elaborated to develop the solution?
4. Analyzing the current solutions: what solutions of the identified needs are already in place and which can be reused or revised when developing the solution?



A teaching scenario is a goal-oriented, student-centered and systematic set of teaching methods and technologies designed to reach teaching goals

Dictionary of Digital Transformation in Education. Moscow, 2009, p. 79);

Specifying goals and metrics

Data-driven digital solutions are one of the principles behind our methods. Data-driven development enables you both to create solutions, the efficiency of which can be tested and confirmed and to work out a process for upgrades and continuous improvement.

When designing digital learning solutions, we prioritize reaching learning outcomes, such as acquiring a skill or developing a notion of a complex concept.

In order to organize the development of the solution and its further implementation, we need **to determine the learning outcome and ways to measure its achievement**. Exactly how well the set learning outcome is being achieved is measured in the next steps. Its achievement rate determines whether a certain feature of the digital solution is to be accepted or rejected.

STAGE 2

Developing the Solution

Once the needs analysis is carried out and the teaching scenario boundaries are pinpointed, we proceed to the development stage.

By the **solution** we mean a student’s target learning experience in a seamless digital learning environment that helps reach the set learning outcomes. The **solution** is comprehensive and includes learning experience (LX), a set of teaching principles, a digital environment and digital tools.

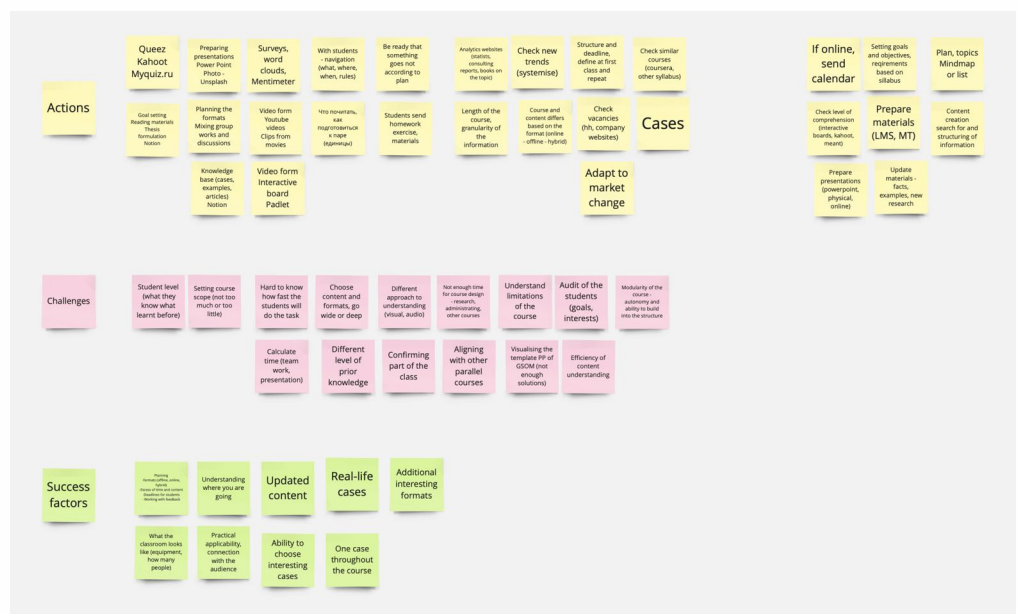
It is important to note that **the solution is designed exclusively from within the methodological framework**: this is achieved by bringing to the forefront the learning outcomes, the teaching needs and the learning experience of the student.

The steps to develop the solution are as follows:

1. Producing a **student journey map (SJM)**
2. Developing sets of **methodological solutions** as responses to the teaching needs and aligning the solutions with the student journey map
3. Creating the environment: **developing and selecting digital tools**
 - a. Formulating Jobs-To-Be-Done (JTBD)
 - b. Developing/selecting digital tools for each task/set of tasks
 - c. Synthesizing the digital tools into a seamless digital learning environment



In fact, experience shows that in spite of iterative development, it is possible to move both bottom-up and top-down between the layers. For instance, when developing digital tools new ideas can help finetune methodological solutions and have an impact on the student journey map as well. This flexibility allows to synchronize learning outcomes, methodology and digital tools within a learning experience.



A fragment of the Miro board for developing a hybrid classroom in GSOM SPbU

STAGE 3

Testing

Once the concept is developed, we can proceed to the testing stage. The cycle of “prototyping – testing – improvement” is repeated until the set learning outcomes are reached.

Generating hypotheses and metrics

Testing sessions are held to examine whether the solution achieves users’ tasks within the set teaching scenario. The list of main hypotheses and validation criteria is formed.

A **hypothesis** is an assumption of the technical solution’s ability to meet learning needs, supported by metrics.

Prototyping

By testing the solution’s efficiency, we create a prototype to save the resources.

A **prototype** is a basic version of the technical solution that does not require significant financial and labor resources and helps the team test key assumptions and efficiency of task realization.

The prototype type is defined by a set of hypotheses that need to be tested. The maturity level of the prototype can be basic, i.e. a “quick and dirty prototype”, or functional, i.e. a final stage of solution development.

Testing

Testing sessions are held in two phases.

Phase one is “laboratory” testing, which means testing in controlled situations outside a real learning process. The learning environment and teaching situation are simulated.

Phase two is testing in a regular learning environment. Testing mechanics are similar to “laboratory” testing.

During both phases the representative sample is essential. Depending on the target audience (the solution users) it is important to test the solution at different learning levels and in different programs and subject areas.

In order to hold testing sessions we design:

- Scenarios
- Evaluation sheets
- Interview plans for each user category
- Questionnaires for each user category
- Brief for testing participants

Improving the Solution

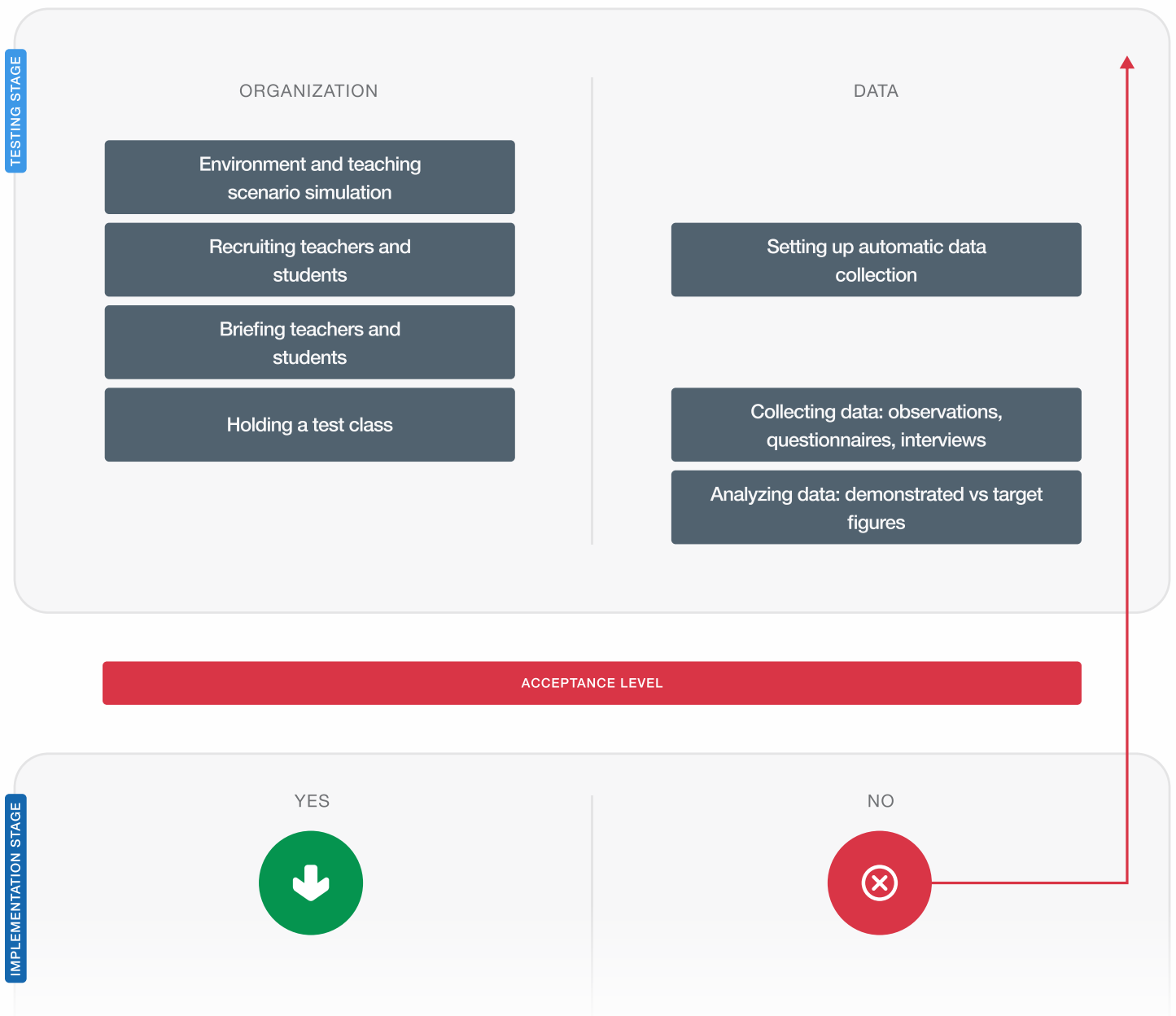
At the end of each testing phase we check whether demonstrated figures match the target figures.

In the case of critical differences between target figures and the figures in the course of testing, the solution is to be revised. Approaches to solution improvement are similar to those applied during initial solution development.

If the solution has significantly changed after revision, a new prototype is designed to test hypotheses.

Once the acceptance level for each of the metrics is reached, we can proceed to the next stage. The acceptance level is determined by experts.

The “testing – improvement” cycle



STAGE 4

Implementing the Solution

The success of a new digital solution directly depends on the engagement of end users – faculty and students. A new solution requires mastering new skills and adjusting habitual actions when realizing learning objectives.

Motivating

Sustained motivation is a major factor for successful implementation. Motivation can be built in the following ways:

1. Financial incentive – compensation for the additional workload during the period of implementing the solution and adjusting the content and approach to teaching.
2. Non-financial incentives
 - a. Professional excellence awards
 - b. Public recognition (sharing information about faculty's innovative teaching approaches on the university website)
 - c. Mentoring, peer-to-peer support and knowledge exchange

Institutionalizing

Methodologically and technically complicated solutions can only be effective if applied correctly. Including the main principles of the digital learning solution in university internal regulations can help standardize the process and avoid any discrepancies in interpreting the terms of use.

Institutionalization is effective when applied at later stages of implementation – after the solution is tested “in the field”, mistakes eliminated and users accustomed to the solution.

Training faculty and students

The main goal of user training is to give a full picture of the solution and to help build new skills for interactions in a new digital environment.

Faculty training program can consist of several parts:

- Teaching aspects of the digital learning solution
 - ❓ *Methodological features. Adapting materials and course mechanics to a new format.*
- Technological solution and faculty user journey
 - ❓ *Becoming familiar with the solution's elements and interface. Learning how the solution works and how it allows to implement teaching scenarios. Detailed description and demonstration of the user journey.*
- Integration of the digital solution into teaching routine and content adjustment
 - ❓ *Alone or assisted by a methodologist, the professor revises and adjusts course materials to the new format and selects solutions for teaching practices.*
- Mastering solution user skills

During faculty training it is important to create a safe environment where the professors can try out the new solution, share doubts and concerns, support each other and advise on content adjustment. Peer-to-peer format and holding test classes with the use of the digital solution have proved to be effective in faculty training.

Student training program has to take into consideration the needs of all the different student groups (e.g. online and in-class students).

Student training should cover the following aspects:

- Operation principles of the new digital solution
 - ❓ *Students should understand how the solution works from different angles. In the case of hybrid learning it is helpful to know how the hybrid classroom works, how the professor sees online students, and how class interactions are organized.*
- Learning contract
 - ❓ *E.g. attendance and camera-on policy.*
- Features of a digital classroom
 - ❓ *E.g. signaling the professor if a problem occurs (sound or content are off), asking a question.*

Promoting through internal communication

Promoting the solution inside the university would help foster faculty interest and encourage them to use new tools in their work.

Supporting at the start

Effective training and promotion programs do not eliminate the necessity of faculty and student support during the first classes that are held using the new digital solution. An IT specialist or an assistant familiar with the features of the digital solution should accompany the first class upon the professor's request.

Assistant's duties:

- **Psychological support.** Presence of an IT specialist or an assistant reduces professor's stress level and allows them to concentrate on teaching.
- **Technical and methodological support.** A consultant assists the teacher during class, takes notes of all difficulties and discusses them with the instructor afterwards.

Refining for specific tasks

Through teaching and support during the first classes we often see new learning objectives that were not taken into account at the stage of digital solution design.

Each teacher's experience is unique, so sometimes individual approach and adjustment of digital solution teaching scenarios may be required. The goal of the implementation team is to find a way to satisfy unique teaching needs within the already developed solution.

The quality of "the last mile" is essential for reaching learning outcomes by means of the new digital solution. It is the main purpose of the whole project.

The key factors at this stage are faculty loyalty and commitment and their willingness to learn and use new tools in their practice. The work style of the implementation team is also essential. It should be helpful, supportive and user-oriented.

STAGE 5

Quality Control and Improvement

The development team's work does not end once regular classes with the use of the new digital solution begin. Experience shows that during the first months users are getting familiar with the solution, specifying use scenarios and identifying new teaching ideas. At this stage technical solutions may experience growth issues.



During the first months it is crucial to perform quality control procedures. If the gap between the implementation objectives, functionality and the quality of user experience is critical, the solution should be revised.

Setting up digital analytics

Integrating digital analytics into developed digital solutions allows to automatically collect big data on achieving learning outcomes, on solution's reliability, usability and other characteristics.

Setting up automatic measurements for a number of metrics can be difficult to implement. Then it is advisable to specify the metrics and select a "proxy".

Proxy metrics is a collateral and closely correlating measure of the target metric, and it requires less resources to assess whether the end result is achieved.

Making manual observations

Besides analyzing automatically collected data, the team makes "manual" observations using evaluation criteria developed during the testing stage.

Observations are made throughout the first month, in the third month, and optionally in the sixth month of using the solution.

Improving the solution

If the gap between the implementation objectives, functionality and the quality of user experience is critical, the solution should be improved.

At this stage, there might be deficiencies in the solution's technical configuration, loose ends of the implementation stage, and other drawbacks whose significance only unfolds during full-scale operation.

Responding to incidents

After the development team has supervised the implementation, revised and improved the solution in the learning process, the solution is handed over to the respective university departments – the IT Department and the Teaching Office.

In case of critical functionality issues that cannot be resolved at the operational level, the support departments may decide to call for the development team and begin the improvement cycle.

Authors of the methods



Teaching Excellence Lab
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St. Petersburg University

The Graduate School of Management at St. Petersburg University is home to the Teaching Excellence Lab. The Lab develops and integrates innovative teaching methodologies and one-of-a-kind digital tools into learning as well as trains and upskills the faculty.

The launch of the Teaching Excellence Lab in 2022 is a major step towards GSOM SPbU's strategic goal of becoming Russia's leading business school with a unique learning environment and faculty dedicated to continuous improvement by 2025.

It is important for us to bring together people who are enthusiastic about education and technology. We are happy to inspire our colleagues and share our experience of digitalization in higher education.

More on other projects of the GSOM SPbU Teaching Excellence Lab at
method.gsom.spbu.ru

Reach us with any questions at
tel@gsom.spbu.ru



What we do

Innovations in education:

- Digital didactics: new digital solutions and tools to teach management programs, for training and workshops.
- Online and hybrid learning: accumulating and promoting best practices and know-how in instructional design, adapting hybrid learning teaching methodology to business education needs.

Promotion of GSOM SPbU's best practices:

sharing knowledge and experience of teaching in a digital learning environment.

Continuous improvement of academic programs and quality assessment system to meet the standards of the international accreditation organizations such as AACSB and EFMD.

Teaching methods:

- Selecting and promoting best practices and know-how within GSOM SPbU;
- Teacher support;
- Workshops, training and teacher advising.

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