



Co-funded by
the European Union



Erasmus+ KA2 Partnership Programme: D-Light Network Project

Blueprint for Digital Learning Solutions for “Digital Rehabilitation”

An ADDIE based Template for Designing Digital Learning Solutions.

©2020



Table of Contents

1. Analysis: Competency Gap, Target Audience and Digital Playboard.....	2
1.1. Instructional Goals: Analysis of Competency Gaps as Specified in the Competency Framework.....	2
1.2. Target Audience Characteristics: Analysis of Student Prerequisites.....	2
1.3. Digital Playboard: Analysis of Technical Possibilities and Limitations.....	2
2. Design: Creating a Blueprint for a Digital Learning Solution.....	2
2.1. Learning Objectives: Specification of a Competency Focus and Creation of Learning Goals.....	2
2.2. Instructional Strategies: Determination of the Required Learning Activities, Educational Contents and Methods for Reaching the Learning Goals.....	3
2.3. Digital Delivery Method: Design of Appropriate Medium, Format, Usability, Application, Availability, and Interface of the Digital Learning Solution According to the SAMR-model.....	6
2.4. Testing Strategies: Integration of Methods for Evaluation and Feedback into the Digital Learning Solution.....	7
2.5. Validation: Feedback from Ongoing Stakeholder (TP 2+3+5) Review of the Proposed Learning Solution.....	7
2.6. Visual Representation: Model of the Digital Learning Solution.....	7
3. Develop: Creation of a Showcase that Realizes a Part of the Blueprint.....	7
3.1. Learning Resources: Creation of Educational Content, Media, Guidance for Activities, and Instructions for Using the Digital Learning Solution.....	7
3.2. Validation: Ongoing Stakeholder (TP2+3+4) Review of Learning Resources and Activities.....	7
3.3. Pilot Test: Adjustments are Made to the Showcase based on Small-Scale Tests.....	7
4. Appendix: Relevant Documents and Models.....	7
4.1. Competency Framework.....	7
4.2. Modified ADDIE Model.....	8
4.3 SAMR Model.....	9
4.4 Digital Playboard.....	9

1. Analysis: Competency Gap, Target Audience and Digital Playboard.

1.1. **Instructional Goals:** Analysis of Competency Gaps as Specified in the Competency Framework.

Confer the [Competency Framework for this Digital Learning Solution](#).

1.2. **Target Audience Characteristics:** Analysis of Student Prerequisites.

Confer the [Competency Framework for this Digital Learning Solution](#).

1.3. **Digital Playboard:** Analysis of Technical Possibilities and Limitations.

Confer the Common Digital Playboard.

2. Design: Creating a Blueprint for a Digital Learning Solution.

2.1. Learning Objectives: Specification of a Competency Focus and Creation of Learning Goals.

This digital learning solution is focused on providing students with the competencies to use a digital tool to independently prepare a tailor-made physical training exercise programme for/with the client.

Even though the learning objectives revolve around the use of a digital tool for preventive rehabilitation, this digital learning solution will not aim solely at providing students with competencies related to digital tools. On the contrary, this digital learning solution also aims at training the students in reflecting upon, understanding, and performing the analogue processes (e.g., observation, assessment, coordination, communication, etc.) that are required when working with – and that are performed by – such a digital tool.

The learning objectives/goals for this learning solution are specified through the general (GC) and partial competencies (PC) listed below.

(GC1) The student can assess the relevance of introducing to the client an individually tailored functional ability exercise programme based on a digital tool as an early preventive intervention. Furthermore, the student can plan and coordinate such an intervention:

- (PC 1.1) The student can independently assess the actual and self-perceived functional ability of the client, as well as the aspirations and motivation of the client to maintain or improve this ability.
- (PC 1.2) The student can determine whether an early, preventive effort including a digitally supported general functional ability exercise training programme would be relevant and beneficial to the client.
- (PC 1.3) The student can plan and coordinate with the client, and other healthcare professionals, (e.g., therapists), whether the use of a digital training programme is considered safe, suitable, and beneficial to the client.

Kommenterede [MS1]: EVV: looking at the mindmap, I'm not sure if all the knowledge is presented in this learning solution, it is more about applying the knowledge and skills. So they should acquire the knowledge before they start with this learning solution. Also, in the mindmap there is no knowledge included about the exercises. Maybe this is in the scope of the ICF? I'm not familiar with this classification.

Kommenterede [MH2]: •What is the scope of this digital learning solution in terms of its competency span? Why?

•What, then, is the specific competency focus for this digital learning solution? Why?

•How does this competency focus translate into learning goals that aim for the construction of specific knowledge and skills?

(GC2) The student can generate and launch a digital tool-based exercise training programme for a client:

- (PC 2.1) The student can collect the relevant functional ability data from the client, launch the digital exercise tool and generate a training programme within the tool by input of relevant data based on the assessment of the client's functional ability.

2.2. Instructional Strategies: Determination of the Required Learning Activities, Educational Contents and Methods for Reaching the Learning Goals.

To facilitate the construction of the knowledge and skills that make up the competencies listed above it is necessary to construct a scaffolded learning experience that trains the students to use a digital tool for preventive rehabilitation and assessing the relevance/need for this based on the client's functional ability (cf. [ICF](#)) and motivation. Furthermore, a part the learning experience must also train the students in determining the relevance of and how to coordinate with other (types of) healthcare professionals.

Therefore, this digital learning solution will attempt to create an experience that requires the students to perform the activities listed below. These activities are, however, not to be perceived as necessarily separate. On the contrary, they can be merged and separated in accordance with what fits best with the digital learning solution.

1. **Observe and assess the functional ability and motivation of a client.** For this purpose, a video (lifelike or animated) of a target client is needed for the student to observe and later assess. The case at this stage must be designed by professionals so that it is usable for observing both (general) functional ability (cf. [ICF](#)) and (degrees of) motivation (e.g., regarding daily living and/or physical exercise). This case is, however, not to be dichotomous in the sense that it includes areas in which there either is a need (100 %) or no need (0 %) for preventive physical rehabilitation. On the contrary, this case must be ambiguous in the sense that it covers a spectrum (0 – 100 %). This is to emulate a real-life situation where students will encounter clients for whom it may be relevant to work with preventive physical rehabilitation in some areas and under specific circumstances, whereas in other it may not be relevant (e.g., either because there is a need for professional rehabilitation, because preventive physical rehabilitation would be irrelevant or superfluous or simply because of a lack of client motivation). This video must include two dynamic "motivation" and "functional physical ability meters" that reacts simultaneously to the different activities that are performed by the client. These meters can ensure that students can assess their client's physical abilities and motivation in relation to different daily activities. Finally, this part of the learning solution could also be designed to provide some sort of interaction with the client through standardized questions and answers that are organized in a multiple-choice format. One possibility is that during video playback the video will occasionally pause and present an array of different questions to the client (e.g., regarding pain, difficulties, motivation, etc.) to which the student will be provided further information on the client's present situation.

Kommenterede [MH3]: •What types of learning activities and experiences can lead to the construction of both knowledge and skills that are specified by the learning goals?

•What types of educational content (e.g., curricula, texts, cases, videos, images, etc.) is required to create a learning experience that can facilitate the construction of the intended knowledge and skills with the students.

Kommenterede [MH4]: EVV: Maybe you can use here a client case and then the information can be 'asked' by the student. So he can ask the client to show how far he/she can bend (and then you have a video or animation), or questions about how motivated the client is. So the student gets a client presented and then he must actively get the information that they need.

Or, do you mean that the student should be able to see in the regular daily activities if the client needs/would benefit from digirehab. This is not totally clear to me.

I like the idea of "meters" (as I have proposed them as well 12)

Kommenterede [MH5R4]: Hi Eva. I have implemented your suggestions so that this part of the learning experience might actually accommodate both.

2. **Assess whether an individually tailored training programme for preventive rehabilitation can be relevant, safe, suitable, and beneficent for the client.** Based on the observations made in the case (+ meters), the students must now be able to assess/determine in which functional areas preventive rehabilitation can be relevant (safe/suitable/beneficent) and in which functional areas it cannot. The client may have a need for preventive rehabilitation in one functional area, whereas other functional areas call for professional assessment and/or rehabilitation (e.g., by nurses, physiotherapists, etc.). Furthermore, a lack of client motivation motivating could also affect whether or not it can be relevant with preventive physical rehabilitation. The student must, therefore, determine those body functionalities of the client that may benefit from preventive rehabilitation and those that will not while also taking into account the client's level of motivation. The student's determination is made by categorizing different bodily functions by choosing between different suggestions (perhaps 5) for preventive physical rehabilitation (e.g., ability to walk, get out of bed, standing up, etc.). Some of these will be correct, and some will be wrong. This feedback can be given here or, alternatively, by sparring with other professionals in the activity below (3).

Kommenterede [MH6]: EVV: This is very clear for me.

Kommenterede [MH7R6]: Ok.

3. **Reflect on when and how to include different types of healthcare professionals for sparring, cooperation and/or coordination when observing and assessing the client.** Following an assessment and determination of the relevance of preventive rehabilitation of the correct bodily functions, the students will be prompted to assess which other types of healthcare professionals (e.g., nurses, doctors, physiotherapists, etc.) it can be relevant to cooperate with when considering working with preventive rehabilitation with this exact client. This could be with the purpose of gathering more information on the client's situation, getting feedback as well as sparring on one's own assessments, etc. These professionals will depict as different avatars that the student selects and ask questions to. After having selected certain health care professionals (avatar) – and not others – and asked different questions from an array of predefined possibilities (multiple-choice format), the student will receive new information on the client's situation (and perhaps feedback on their assessments in exercise 2). This stage is designed so that depending on the chosen health care profession the students will receive different information feedback that necessitates the students to modify their own assessments on the relevance of preventive physical rehabilitation. However, even though the student can, he/she should not pick too many professionals (avatars) to cooperate with since too much information gathering/sparring slows down the preventive rehabilitation process and will negatively impact the client's "motivation" and "functional physical ability meters".

Kommenterede [MH8]: EVV: should the student be able to ask questions when they are not sure about a body part. So that they have the choice to consult another professional, before their definitive assessment. And when for a specific body part a professional is needed, shouldn't the student refer the client to them for that part and only focus on the other parts? I think you can merge 2 and 3 together, since they both are about the assessment.

Kommenterede [MH9R8]: Hi Eva
These phases are not meant to be read as different parts of a learning solution, but rather as an analysis of the different kinds of activities/experience that must be included in the learning solution. Therefore, these phases can be merged and separated in different ways as long as they are performed in some way or another.

Kommenterede [MH10R8]: I have also included the question asking of the avatars as a suggestion in this phase.

4. **Input correct data into a digital tool in the correct format.** Based on the stages listed above, the student has now assessed the client's areas of general physical functionality as well as the areas in which it is/is not relevant to work with physical rehabilitation. Therefore, the student must now collect and input data from observation and professional sparring into a table/questionnaire in a digital tool (e.g., [DigiRehab](#), a [digitized ICF-table](#) or something similar). In this digital tool the students must index the actions below into the categories

Kommenterede [MH11]: EVV: is this something that the student does in the learning solution? What information should the student put here?

Kommenterede [MH12R11]: Yes. Either through a tool like DigiRehab that asks specific questions concerning the client's physical functionality or by a digitized ICF-table. The point is, that the student need to use the digital tool to input the information gathered about the client both through observation, client interview and sparring with other professionals.

“No/insignificant limitation – Slight limitations – Moderate limitations – Severe limitations – Total limitations:

- Eating.
- Drinking.
- Dressing and undressing.
- Washing oneself.
- Using the toilet.
- Moving around.
- Changing of body position.
- Walking.
- Performing domestic activities.
- Acquiring goods and services.
- Physical capabilities (ability to perform different exercise at different levels (1-4) of physical strain while also allowing for the choices “cannot be executed”, “pain” and “insufficient capabilities”:
 - Pelvic lift.
 - Supine to sitting.
 - Sitting without support.
 - 30-second Sit-to-stand test.
 - Standing balance.
 - 4 metre walk tests (level/speed).
 - Timed up-and-go.
 - Dynamic balance

This part of the learning solution solely aims at teaching the student to understand and fill in a professional assessment questionnaire. The data input in this questionnaire must carry over to part five of the learning solution.

5. **Access the exercises/instructional videos (output) that are proposed by the digital tool based on the user’s input.** Based on the data input above, the digital tool will propose different types of physical exercises for preventive rehabilitation that may be suitable for the client in the chosen case. However, not all proposed exercises will be equally suitable when considering the client’s motivation, history, observations as well as previous sparring with relevant professionals. This is to ensure that the student need to reflect professionally on and distinguish between the physical exercises’ different degrees of relevance in the context of this exact client. This has the potential for students to learn to avoid applying proposals from digital tools directly into practice without first using their professional observations and knowledge to assess them. As a result, one of the (x amount) of suggested exercises will actually be inappropriate for this specific client (e.g., due to bodily functionality, motivation, etc.), and both the client case (cf. observation) and professional sparring will have provided information for the student that will help them to distinguish this proposed exercise from the others.

Kommenterede [MH13]: EVV: so for this you’ll need the student to make a choice for the exercises they present to the client.

Kommenterede [MH14R13]: Yes. The splitting up of 5-7 is to demonstrate different mental processes. However, they can - and probably should - be combined in the learning solution.

Kommenterede [A015]: I am not sure, that I agree about this sentence. When the digital tool creates exercises, the client is meant to perform them.

Kommenterede [MS16R15]: OK. It is now modified on the basis of your feedback :)

6. **Performance of the relevant physical exercises.** Based on the assessments made above, these exercises will be performed by the client in some kind of simulation (ultra short video, animation, etc.) or by “dragging” symbols of the exercises to the client who then reacts (or into a daily program). While these videos/animations are shown, they will be accompanied by two dynamic “motivation” and “functional physical ability meters” that both react simultaneously (go up or down) to the different activities performed by the client (or of the daily program). And if student the present the client with exercises that are too difficult or out of the client’s range, then a symbol could appear on the body part that is hurting.
7. **Evaluating the exercises.** After having observed the client perform the suggested exercises (accompanied by “motivation” and “functional physical ability meters”), the client will have to evaluate the exercises. This is done through the DigiRehab app (or something similar). This evaluation is carried out by registering the client’s physical functionality, potential pain and motivation levels during the exercise. This will lead to a revision of the proposed activates by DigiRehab.
8. **Summation.** Finally, the student will receive feedback on their performance (e.g., choices, assessments, etc) by comparing the client’s “new” situation of bodily function and motivation to the client’s previous situation.

2.3. **Digital Delivery Method: Design of Appropriate Medium, Format, Usability, Application, Availability, and Interface of the Digital Learning Solution According to the SAMR-model.**

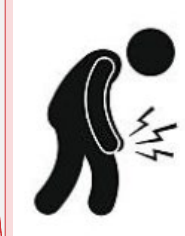
First, it is recommended that the digital learning solutions is cloud-based and accessible by means of computers, phones, and tablets. Secondly, if possible, it is recommended that [DigiRehab](#) – or something like it – is implemented into the learning solution (or the other way around).

The digital medium must be able to support video playback, multiple-choice questionnaires, and interaction with visual images/avatars and questionnaires.

The digital learning solution could be implemented in different kinds of digital media. The most important thing is to identify an application, technology or platform that can accommodate as many of the activities in 2.2 as possible. It could perhaps be something similar to:

- an app-like product with a somewhat static menu/interface and dynamic meters.
- Interactive and branching video experience (e.g., using [interactive video with HSP](#)) with dynamic meters.
- A VR experience in which students move around in different task-rooms (e.g., using [ThingLink](#) or [virtual tours with HSP](#)) that requires questions to go from one room to another + dynamic meters to track progress.
- A game/digitally simulated environment (e.g., using CoSpaces, Roblox or [branching scenarios with HSP](#)) with dynamic meters to track progress.

Kommenterede [MH17]: EVV: I see now that the ‘choosing’ is in 6. I think you can merge 5 and 6 as well, so that it is clear that this is one process. I think it won’t be that relevant to let the client actually do the exercises (I feel the student might get bored). Maybe let them drag the exercise to the client and they respond with a smile and thumbs up and a filled meter, or with a frown and the meters will go down. Or, let them choose how many exercises and maybe the time of the day. Then they drag the exercises in a daily program. They submit this and see the ‘end situation’ of this daily program in the client’s meters. Then they can adjust the program if the meters are not at the desired minimal values. Also, if the students present the client with exercises that are too difficult or out of the client’s range, then a symbol could appear on the body part that is hurting.



Kommenterede [MH18R17]: Your suggestions are noted.

Kommenterede [MH19]: EVV: see what I wrote above by six. Comparing them with the beginning is also nice. But I think you should also have something you should strive for.

Kommenterede [MH20R19]: Yes. The splitting up of 5-7 is to demonstrate different mental processes. However, they can - and probably should - be combined in the learning solution

Kommenterede [MH21]: EVV: I don’t know if you really need branching scenario’s for the learning activities you described, it seems pretty straightforward to me. Also, maybe it can be nice that students also have the possibility to use some kind of ‘question mark’ and get offered additional explanation about exercises. Or maybe a ‘play mode’ in which they follow the steps mentioned above and a ‘learning mode’, in which a client is presented to them with a voice-over or text that explains the steps and why certain choices are made.

Kommenterede [MH22R21]: I agrees. Good ideas!

Kommenterede [MH23]: •What digital formats/interfaces can serve as appropriate and efficient mediums for facilitating an interactive learning solution that can accommodate both the learning experiences and educational content that are required for students to reach the specified learning goals?

•How is the application of this digital interface/format/medium affecting the didactics of the learning situation? Substitution, Augmentation, Modification or Re-definition (cf. SAMR)?

This digital learning solution aims to transform the students' learning experience by allowing for significant task redesign and redefinition since it facilitates a digital simulation of observation and assessment followed by feedback.

The digital learning solution should include a "HELP-button" that provides students with additional explanations, support and help concerning tasks or proposed exercises. Alternatively, the digital learning solution could consist of a play- and a learning-mode. In the play-mode, the student will complete the tasks listed above (1-7), while the learning-mode will take them through a completed example of each of the steps and explain the reasoning behind each of the demo-choices.

2.4. Testing Strategies: Integration of Methods for Evaluation and Feedback into the Digital Learning Solution.

Student feedback will primarily be visual and in the form of the "motivation" and "functional physical ability meters", pain-icons, etc. that change dynamically depending on the observations/inputs/choices made by the students. Furthermore, pupils can also see the feedback in the form of colour-coded markings on an image of the client's whole body (red, yellow, green). This colour-feedback, however, cannot stand alone but must be supplemented by brief, professional/theoretical substantiation.

2.5. Validation: Feedback from Ongoing Stakeholder (TP 2+3+5) Review of the Proposed Learning Solution.

2.6. Visual Representation: Model of the Digital Learning Solution.

3. Develop: Creation of a Showcase that Realizes a Part of the Blueprint.

3.1. Learning Resources: Creation of Educational Content, Media, Guidance for Activities, and Instructions for Using the Digital Learning Solution.

3.2. Validation: Ongoing Stakeholder (TP2+3+4) Review of Learning Resources and Activities.

3.3. Pilot Test: Adjustments are Made to the Showcase based on Small-Scale Tests.

4. Appendix: Relevant Documents and Models

4.1. Competency Framework

Kommenterede [MH24]: EVV: when working with questions with a right or wrong answer, or the form that is mentioned in step 4, I think you should also include feedback on the answer the student gives with right/wrong, and why. But maybe this is what you mean with the colour-coded markings?

Kommenterede [MH25R24]: Yes.

Kommenterede [MH26]: •How can test protocols and feedback – both formative and summative – be integrated into the digital learning solution?

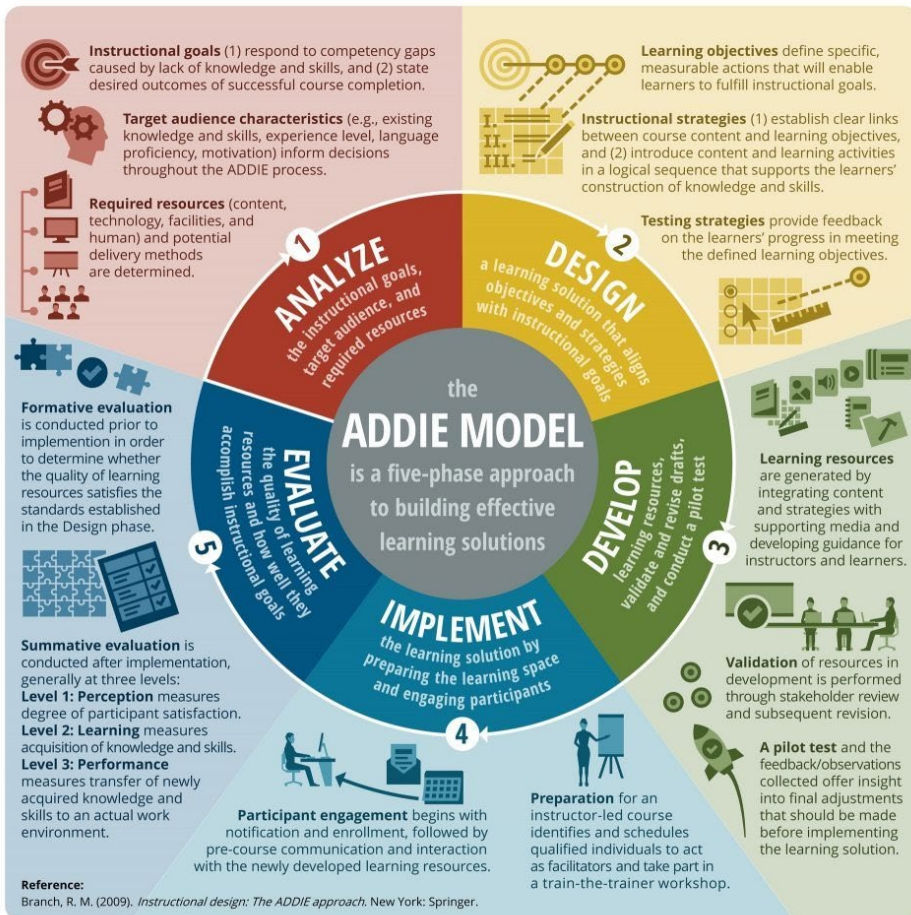
Kommenterede [MH27]: •What do TP2+3 say about the didactic and pedagogical aspects of the digital learning solution?
•What do TP5 say about the useability, availability, and feasibility of developing this digital learning solution?
•What technological, didactic, pedagogical, organizational or infrastructural considerations might we have overlooked?

Kommenterede [MH28]: Finally, the work above is visualized by creating a model og flow chart which sketches the learning process and interaction with the digital learning solution.

Kommenterede [MH29]: Insert high-resolution image of the competency framework here.

4.2. Modified ADDIE Model

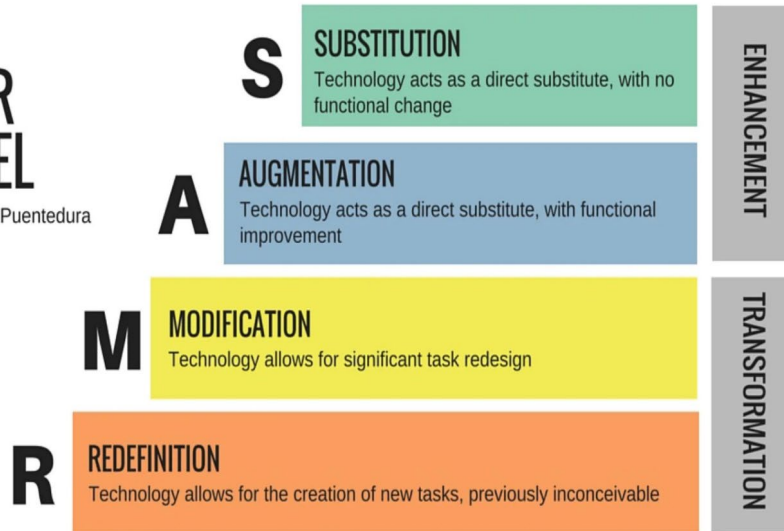
Kommenterede [MH30]: Edit ADDIE model in accordance with our final proces.



4.3 SAMR Model

THE SAMR MODEL

Dr. Ruben R. Puentedura



4.4 Digital Playboard

Kommenterede [MH31]: Insert a model of our common digital playboard,