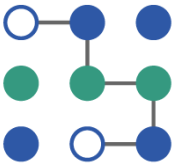
International Collection of Virtual Patients - Digitized Education in Europe beyond the pandemic



iCoViP

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IO2 - Collection of multilingual virtual patients

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Authors	UAU, KUM
Reviewed by	All partners

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1. Introduction

A major aim of the iCoViP project was the development of 200 multilingual virtual patients (VPs). The VP collection should be diverse, interdisciplinary, and comparable with a real-world patient population. After having planned the metadata of this collection in IO1, we describe in this report the creation of the VPs in IO2. This process includes the training of VP authors, creation, didactical review, content review, and translation from English into French, German, Polish, Portuguese, and Spanish. We used the project management tool Trello to document this complex process indicating for each VP the current status.
Following this process we managed to deliver a high-quality VP collection that, thanks to our careful planning and rigid quality management process, fulfills our expectations in terms of diversity, realism, and quality. The collection is publicly available via the learning system CASUS provided by Instruct gGmbH in language-based courses and clustered into key symptoms.

2. Methods

At the beginning of this intellectual output, we set up a multi-step VP development process based on our experiences with prior projects and VP creation in general [1-3].

2.1 Training

Before starting the actual development of virtual patients, we trained the new authors in didactical aspects of creating VPs. KUM and UAU conducted an online workshop and provided a training document for authors with the main didactical and legal aspects. The covered topics were:

- Learning objectives
- Copyright aspects for multimedia material
- Structuring a VP
- Designing high quality questions and answers
- Creating the concept map to visualize the clinical reasoning process
- Composing a summary statement

We updated this document regularly with answers to questions raised by the VP authors and new aspects we encountered during didactical review. Additionally, during the first few months of VP creation, we held regularly bi-weekly meetings to discuss VP creation aspects and clarify open questions.

2.2 Process

In the following we describe the multi-step process of creating, reviewing, translating, and publishing the 200 virtual patients.

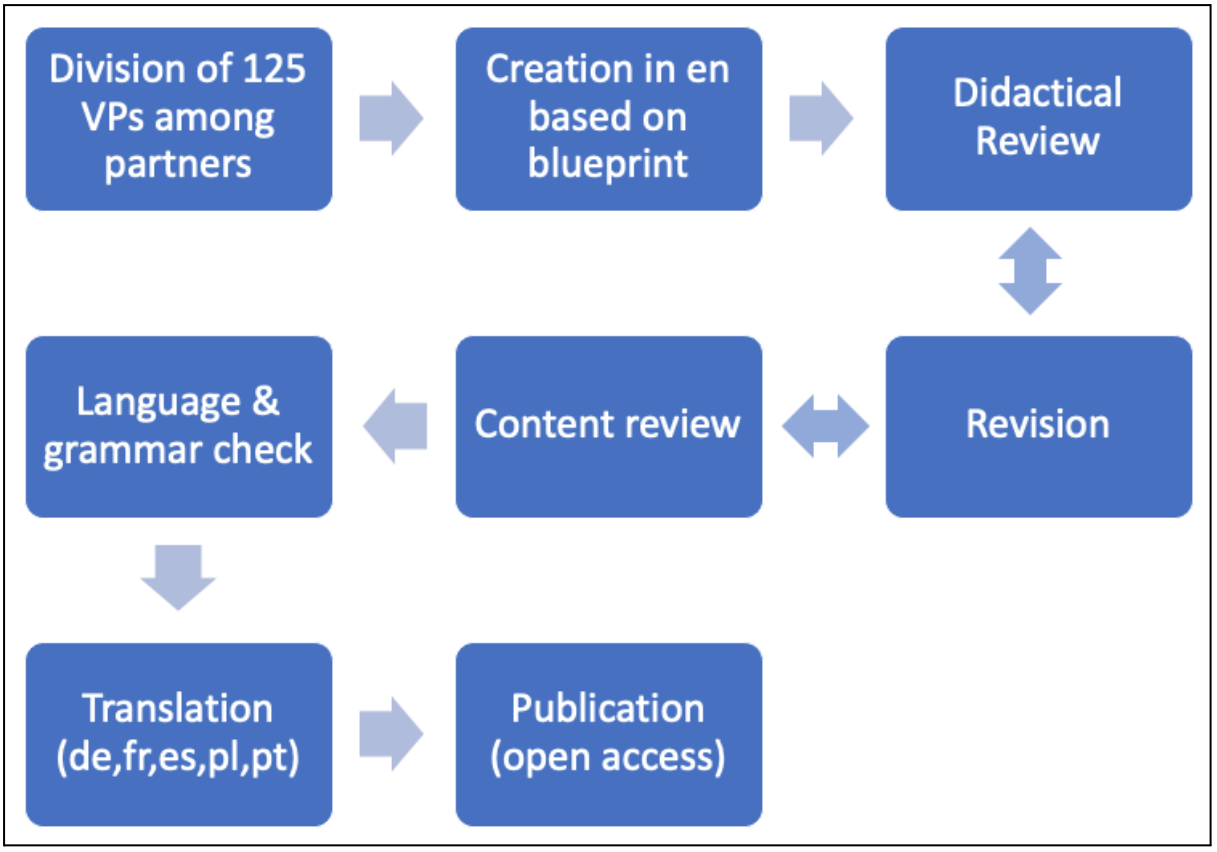

Figure 1: Summary of the VP creation, review, and translation process.

2.2.1 Creation and Review

After having described the 200 VPs in our blueprint [4, 5], we organized an online meeting to divide the VPs among the partners in a round-robin approach. Then, partners chose their first VP to develop with close support and regular didactical feedback from KUM and UAU. Before handing the VP over for the didactical review, authors were asked to complete a checklist, to make sure that they considered the most relevant didactical and technical aspects. In the beginning partners needed a bit more time to get familiar with didactical aspects of VP creation, such as storytelling, didactical reduction, and the creation of the clinical reasoning concept map. Once partners managed to create their first VPs, we increased the pace and managed to create 3-5 VPs / month. After a VP had been created in English, the following steps were implemented and documented in our project management tool Trello (see figures 1, 2, and table 1):

Step	**Responsible**	**Trello activity - Move card from**
VP creation started	Author	"Backlog" to "Creation in en"

Didactical review round 1 by	KUM or UAU	"Creation in en" to "Didactical Review I"
Revision of VP - round 1	Author	"Didactical Review" to "Revision I"
Didactical review round 2	KUM or UAU (alternating from round 1)	"Revision I" to "Didactical Review II"
Revision of VP - round 2	Author	"Didactical Review II" to "Revision II"
Content review based on a guide	Different partner	"Revision II" to "Content Review" and assignment to reviewing partner
Revision of VP - round 3	Author	"Content Review" to "Revision after content review"

Table 1: Overview about steps of VP creation and review and visualizing the process in Trello.

For the didactical review we used a template, which provided the following structure for the review process:

- Metadata of the VP (e.g. authors and institution)
- Comparison with description in blueprint
- Overall structure
- Multimedia material (e.g., appropriate use of images, copyright aspects)
- Textual aspects (e.g., storytelling, use of dialogs or active voice)
- Question and answers (e.g., basic didactical principles considered)
- Concept mapping (visualization of clinical reasoning)
- Any other comments

The content review of the VPs was done directly in the CASUS system using the integrated feedback functionality. Reviewers can leave comments on each card of the case and authors can access these directly when opening the VP in the authoring system.

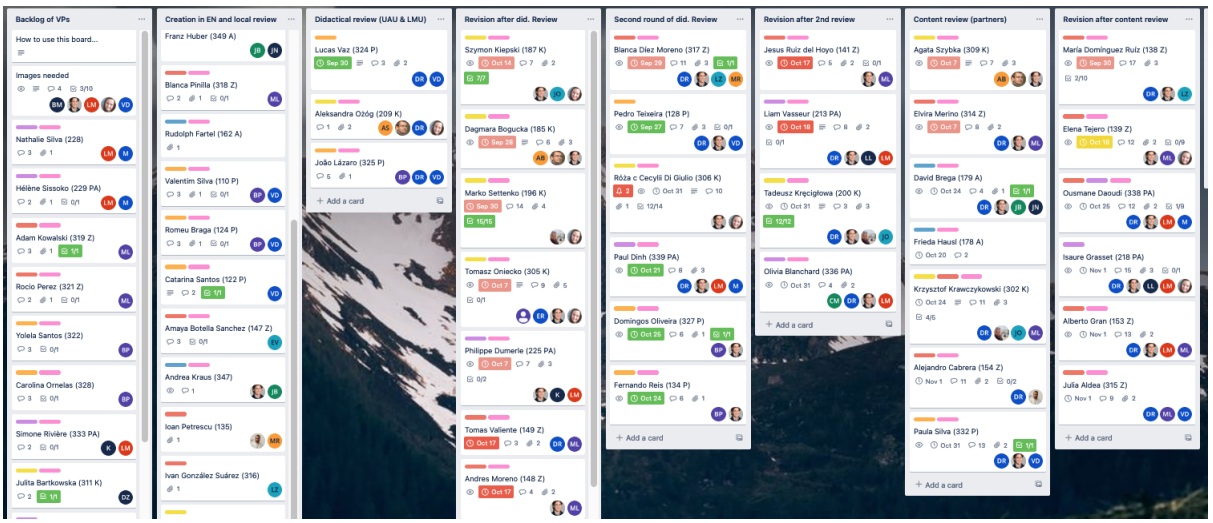

Figure 2: Screenshot of Trello board with the columns for VP creation and review (October 2022)

2.2.2 Translation

Table 2 provides an overview of the steps required to translate the VPs from English into the partner languages.

Step	**Responsible**	**Trello activity - Move card from**
Language & grammar check	KUM	"Revision after content review" to "Language check"
Formal review and preparation for translation	UAU	"Language check" to "Translation preparation"
Translation of VP	Partners (except UAU)	"Translation preparation" to "Translation"
VP completely translated		"Translation" to "Completed"

Table 2: Overview of the necessary steps for translating a VP and the documentation in Trello.

The formal review and preparation of translation included the following sub-steps:

- Final formal review of the VP
- Export of the VP as a pdf file (internal functionality of the CASUS system)
- Translation of the pdf version of the VP with DeepL into the partner languages
- Copying the VP into the language versions (internal functionality of CASUS)

With the DeepL files and the prepared VPs, partners were able to translate the VP quite efficiently. The DeepL translation was already quite good and just needed some refinements, e.g., using layman language instead of medical terms for the patient dialogs.

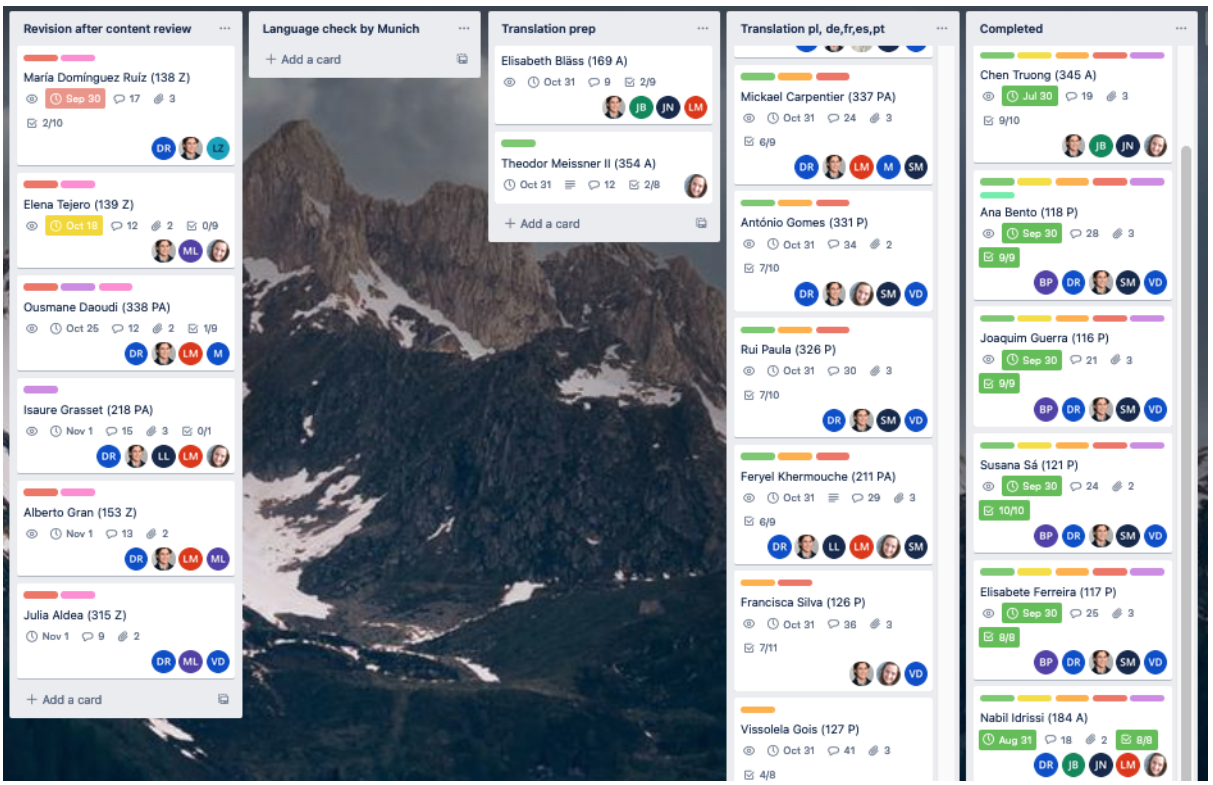

Figure 3: Screenshot of our documentation of the translation process in Trello (October 2022)

2.2.3 Publication

To publish the completed VPs, we set up a course for each language. To access these courses, students can register or login on the CASUS platform. We grouped these courses using the following key symptoms that we had agreed upon during our planning in IO1:

- Fatigue
- Diarrhea, vomiting, and weight loss
- Syncope / Loss of consciousness
- Cough, sore throat, and wheezing
- Headache
- Pain and back pain
- Fever
- Jaundice, rash, and urinary tract symptoms
- Abdominal pain
- Chest pain, edema, and palpitations
- Dyspnea
- Miscellaneous

After a VP had been successfully translated into the partner languages, we published it by adding it to the available courses.

3. Results

Following the described methods, we managed to provide the collection of 200 VPs in English and our partner languages. The outline of these VPs has been described in the publicly available blueprint (IO1).
All VPs are similarly structured into 5-8 screencards and include the visualization of the clinical reasoning process including findings, differential diagnoses, final diagnosis, tests, treatment options, and connections in a concept map (see figure 4).

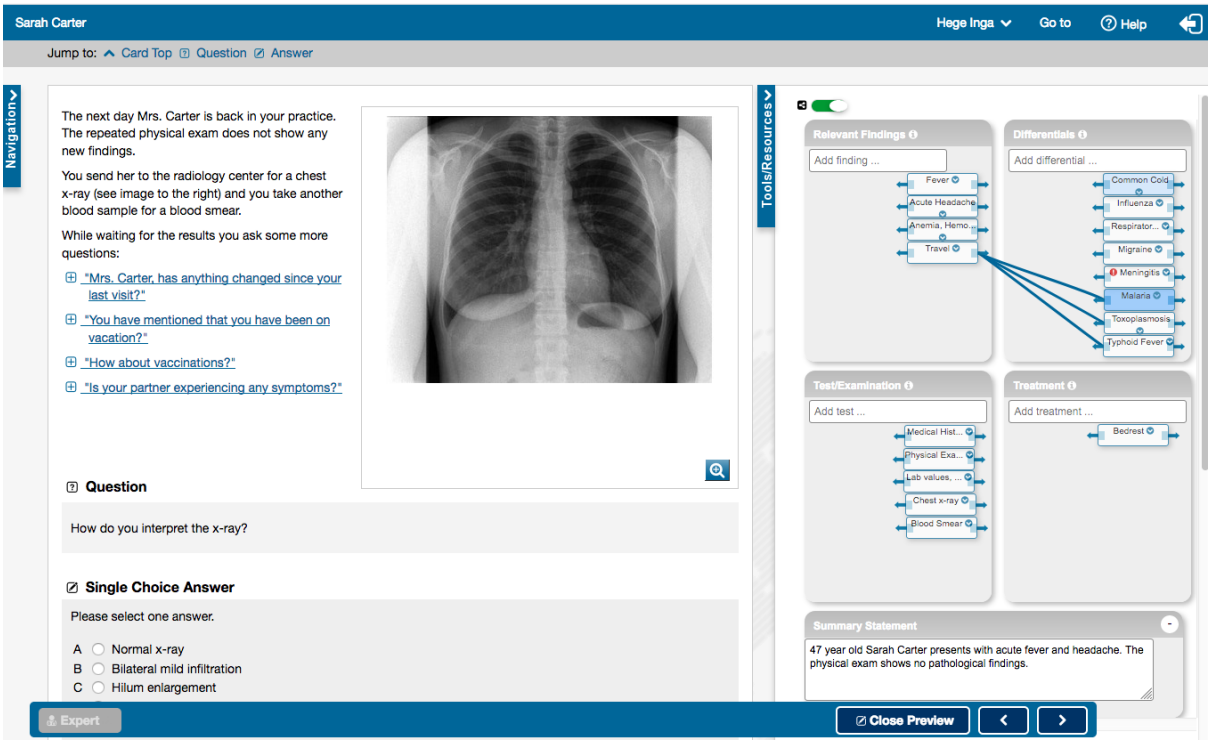

Figure 4: Screenshot of a screencard of one of the VPs with the concept map on the right side.

The VPs can directly be accessed via the learning platform CASUS at https://crt.casus.net.

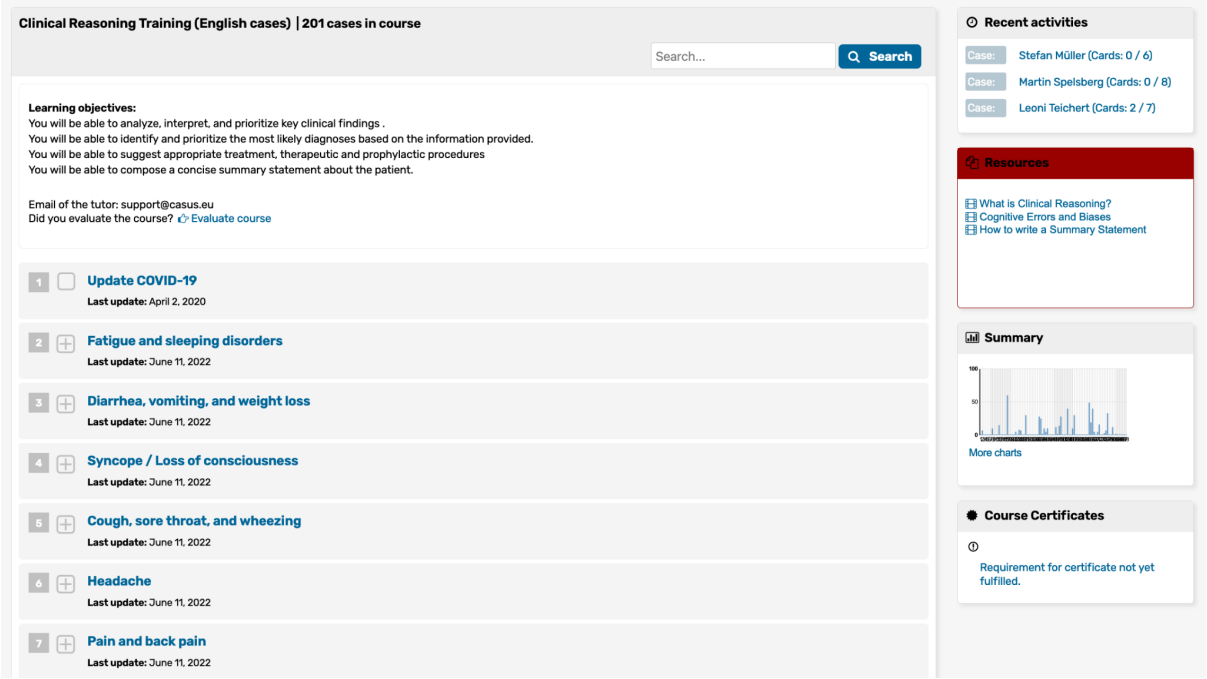

Figure 5: Screenshot of the learner dashboard in CASUS showing the clustering of VPs based on key symptoms (Mid March 2022 with all 200 completed VPs).

4. Conclusions

The implemented steps in our creation, review, and translation process ensured a high quality of the VP collection concerning didactical and formal aspects, as well as content. It was important to train and support authors thoroughly in the didactical aspects of VP creation and especially the visualization of their clinical reasoning using concept maps.

5. List of created / used resources

- Blueprint describing the VPs
- Introduction into VP creation including a instructional video from a former project
- Checklist for authors
- Didactical review template
- Content review guide
- Published VPs in CASUS (register with your email or use the EduGain button)

6. References

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2. Kononowicz AA, Hege I. Virtual patients as a practical realisation of the e-learning idea in medicine [Internet]. INTECH Open Access Publisher; 2010. (Link)

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