Chapter 6
Supplementary Online Resources for the Development of Behaviour Change Support Competencies

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The Train4Health project addresses the challenge of the skill gap in behaviour change support through an innovative open-access educational package, comprising case studies, a massive open online course (MOOC) and a web application to simulate behaviour change support in persons with chronic disease.

These products were developed by an interdisciplinary team (nursing, pharmacy, sport science and informatics), in consultation with experts in behaviour change and interprofessional education.

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Overall, educational products provide learning activities aligned with the interprofessional competency framework and the learning outcomes. The latter were developed as part of a transnational curriculum, already described in Chap. 1.

Innovation was pursued by materialising ideas based on existing or newly produced knowledge, as listed below, leading to the generation of value:

- Knowledge on case studies and MOOC design, within-simulation feedback and post-simulation debriefing and theory on gamification, to guide development.
- Knowledge from European projects, such as Sim-Versity,[1] to ensure diversity and inclusion in case studies (e.g. ethnicity and sexual orientation), and WE4AHA,[2] to offer a holistic persons' profiles for case studies.
- Knowledge from behaviour change science, such as theories, models and a behaviour change taxonomy, to guide the content produced.
- Knowledge from transnational co-production with students and academic educators in nursing, pharmacy and sport science, to maximise the fit with perceived needs and preferred features.

Testing of the products and assessment of learning outcomes were conducted by different teams within the project, working collaboratively with developers, underpinned by a review on digital tools in behaviour change support education (Gosak et al., 2021). Testing was conducted iteratively, through improvement cycles, contributing to quality and alignment with users' preferences.

The MOOC provides an interactive format of the information presented in this book. Next, the two other products – case studies and the web application – are presented. Case studies are of particular interest for academic educators teaching behaviour change support in chronic diseases, while the web application offers flexibility to students independently pursuing training outside the classroom. This book informs the answers to case study questions and is a resource to post-simulation feedback in the web application, by providing readily accessible, peer-reviewed and up-to-date information. Both educational products direct learners to specific sections of this book and are open access (Box 6.1).

Box 6.1 Practical Aspects for Using the Case Study Toolkits and the Web Application

- Access the Train4Health website (https://www.train4health.eu/) for the most up-to-date releases and the full range of materials, in the "Resources" tab.
- Copyright under an open licence, which permits non-commercial no-cost access, re-use, re-purpose and redistribution by others, provided that the source is acknowledged (CC BY-NC-SA 4.0, https://creativecommons.org/licenses/by-nc-sa/4.0).

[1] Sim-Versity is an Erasmus plus project (https://sim-versity.eu), which aims to optimise patient safety by integrating cultural competence into simulation-based education of health professionals.

[2] Horizon 2020 project, WE4AHA (Widening the support for large-scale uptake of Digital Innovation for Active and Healthy Ageing), under the umbrella of which the Blueprint action created 12 personas (https://blueprint-personas.eu/)

6.1 Case Study Toolkits

Case studies are an instructional method that engages students in the discussion of specific situations, typically real-world examples, providing context and allowing students to learn in a controlled environment. Group work is a privileged form to reflect on the case and to collaboratively address questions that have no single right answer; the educator's role is facilitating decision-making and group work (Thistlethwaite et al., 2012).

Four case study toolkits were produced; each is composed of four components that work together, intending to provide the best teaching and learning experience:

- The **person's profile** presents the story of a person with one or more chronic diseases, unravelling health behaviour change opportunities. Each profile was primarily designed to support change in selected target behaviours, such as physical activity, smoking cessation and diet, with increasing complexity.
- **Learning outcomes and related resources**, linked with content topics, open-ended questions and suggested accompanying reading.
- **Assessment criteria**, for in-class group work, to be used by educators, and self-assessment criteria for students
- **Guidance for educators**, to aid the teaching process and classroom implementation.

The persons' profiles offer diversity, not only in terms of gender, age, ethnicity, sexual orientation and social and functional status but also geography (Fig. 6.1). There are versions available in languages other than English, some of which suffered cultural adaptation by the community of early adopters[3] of the project's educational products. Authenticity was pursued by relating each case to real life and through the consultation with persons living with chronic disease and other stakeholders.

Fig. 6.1 The four Train4Health persons' profiles, in increasing order of complexity

[3] A programme to engage educators or institutions in the early adoption of the T4H educational products

We suggest that in-class use of case studies should start with preparation by academic educators, requiring reading and getting familiar with the person's profile, selecting learning outcomes and questions, deciding whether pre-class and/or post-class assignments are warranted and planning in-class dynamics (e.g. group formation and reporting). Then students receive the person's profile and discuss the answers to the selected questions as group work, in-class.

Continuous improvement of case study components was based on internal peer-review and iterative tests with students and educators, focusing on aspects such as clarity, the perceived realism of person's profile, perceived value and overall opinion, through a self-administered online survey. In essence, testing was done in samples that did not experience classroom use of case studies and in those using case studies in class, across different geographies. In-class testing encompassed both face-to-face and online contexts, within and beyond the consortium, taking advantage of the Physical Activity and Lifestyle (PAL) network and the early adopter's programme. Globally, the case studies were tested by over 20 educators and 750 students, with overall positive feedback.

6.2 Web Application to Simulate Behaviour Change Support

The Train4Health web application offers a safe environment for training behaviour change support, in which users play the role of a health or another professional and interact with 2D virtual humans, playing the role of persons with chronic disease. The web application allows convenient access via web browsers in a range of devices (smart phones, tablets, laptops and desktops) without the installation of a specific application.

Simulation consists of interactive experiences with the four animated persons' profiles, depicted in Fig. 6.1. These virtual humans are capable of speaking through a synthetic voice (currently in English only) and express different facial expressions. Subtitles shown in the interface ensure inclusiveness for users with hearing impairment or less proficiency in English.

The web application is composed of three key menus: simulations, performance and resources.

The simulation experience starts with the case of Maria José, which is the less complex case (Fig. 6.1). The others are sequentially unlocked as sessions with lower levels of difficulty are completed, allowing a stepwise learning. Users are offered the opportunity to train both brief and long interventions.

Before starting each session, learning outcomes are presented. Then, the user engages in dialogue with the selected virtual human through buttons presenting two options, one of which is considered more correct (Fig. 6.2). Selecting the more correct option determines progression in the dialogue; choosing the less correct option prompts performance-based feedback and then directs the user to the conversational thread.

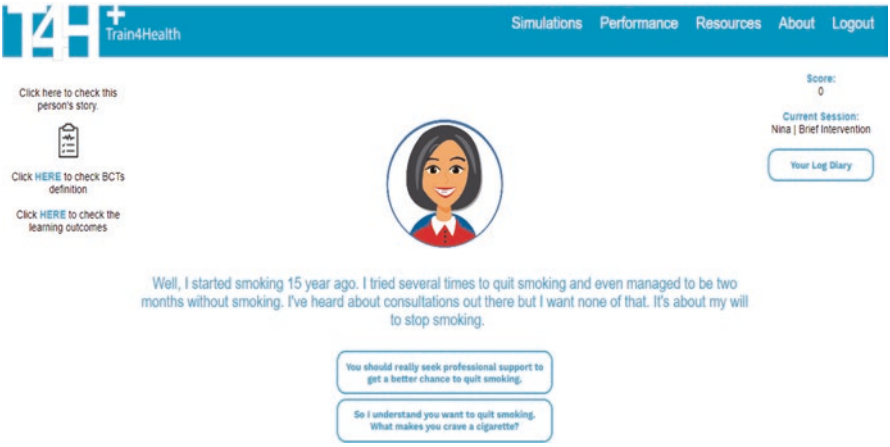

Fig. 6.2 Interface with Nina's dialogue (SimSoft2.0)

Fig. 6.3 Interface with user performance in relation to learning outcomes (SimSoft2.0)

At the end of the session, the user gets feedback in relation to each learning outcome plus a performance score. Feedback directs the user for resources to improve learning, where needed, via the "Resources menu". Finally, the user is invited for a self-debriefing session via Gibbs' reflective cycle (MacKenna et al., 2021).

The performance menu displays selected gamification features, such as points, statistics and acknowledgement through badges. The Self-Determination Theory enabled an understanding of how gamification enhances engagement and motivation while helping to avoid pitfalls in implementation (Rutledge et al., 2018). Assessment of learning outcomes in each session and across sessions is computed through algorithms informed by the choice of answer options. A dashboard with the user performance per learning outcomes across scenarios is also depicted (Fig. 6.3), accompanied by feedback and feedforward for resources.

The **Resources** menu encompasses information on the ABCD approach for structuring behaviour change support (detailed in Chap. 5), a list of core behaviour change techniques for the self-management of chronic disease, a glossary (Guerreiro et al., 2021) and a hyperlink to this book.

The web application was tested iteratively with students and educators. In the first iteration, usability was evaluated using a multi-method approach, comprising the system usability scale (Brooke, 1996) coupled to additional questions, previously piloted plus task performance with a think-aloud protocol (Silva et al., 2021). Data were collected in online individual sessions with a sample of 12 students, 15 educators and 3 researchers, from 4 nationalities. Almost all participants were able to complete the full set of proposed tasks; only about 1% of the tasks were not completed. The overall experience with the simulation software was scored 4.5 in a 5-point Likert scale (1, bad; 5, excellent) whilst the average result of the System Usability Scale (SUS) was 85.7 (scale 0–100), which can be classified as an excellent score (Bangor et al., 2009). After minor adjustments, subsequent iterations explored specific features of the web application and its usability in real use context. This means that participants had the opportunity to use the software individually at their own pace, followed by data collection through a self-administered online questionnaire, which included the SUS.

Key Points

- Ideas leading to innovative behaviour change support education products were materialised by resorting to existing knowledge from diverse fields (e.g. education, behaviour change science, transnational co-production with students and academic educators).
- Case studies and the web application were developed by an interdisciplinary team, guided by the Train4Health interprofessional competency framework and associated learning outcomes.
- This coherent educational package is expected to be useful to a broad range of groups, including academic educators, students and professionals of health and related fields.
- These educational products are available under an open licence that permits no-cost access, re-use, re-purpose and redistribution by others, provided the source is acknowledged.

References

Bangor, A., Kortum, P., & Miller, J. (2009). Determining what individual SUS scores mean: adding an adjective rating scale. *J. Usability Stud., 4*(3), 114–123.

Brooke, J. (1996). SUS: a "quick and dirty" usability scale. In P. W. Jordan, B. Thomas, B. A. Weerdmeester, & I. L. McClelland (Eds.), *Usability Evaluation in Industry (Pp. 189–194)*. Taylor & Francis.

Gosak, L., Štiglic, G., Budler, L. C., Félix, I. B., Braam, K., Fijačko, N., Guerreiro, M. P., & Lorber, M. (2021). Digital tools in behavior change support education in health and other students: a systematic review. *Healthcare, 10*(1). https://doi.org/10.3390/healthcare10010001

Guerreiro, M. P., Strawbridge, J., Cavaco, A. M., Félix, I. B., Marques, M. M., & Cadogan, C. (2021). Development of a European competency framework for health and other professionals to support behaviour change in persons self-managing chronic disease. *BMC Med. Educ., 21*(1), 1–14. https://doi.org/10.1186/s12909-021-02720-w

MacKenna, V., Díaz, D. A., Chase, S. K., Boden, C. J., & Loerzel, V. (2021). Self-debriefing in healthcare simulation: an integrative literature review. *Nurse Educ. Today, 102*, 104907. https://doi.org/10.1016/j.nedt.2021.104907

Rutledge, C., Walsh, C. M., Swinger, N., Auerbach, M., Castro, D., Dewan, M., Khattab, M., Rake, A., Harwayne-Gidansky, I., Raymond, T. T., Maa, T., Chang, T. P., & Quality Cardiopulmonary Resuscitation (QCPR) leaderboard investigators of the International Network for Simulation-based Pediatric Innovation, Research, and Education (INSPIRE). (2018). Gamification in action: theoretical and practical considerations for medical educators. *Acad. Med., 93*(7), 1014–1020. https://doi.org/10.1097/ACM.0000000000002183

Silva, A. G., Caravau, H., Martins, A., Almeida, A. M. P., Silva, T., Ribeiro, Ó., et al. (2021). Procedures of user-centered usability assessment for digital solutions: scoping review of reviews reporting on digital solutions relevant for older adults. *JMIR Hum. Factors, 8*(1), 1–14. https://doi.org/10.2196/22774

Thistlethwaite, J. E., Davies, D., Ekeocha, S., Kidd, J. M., MacDougall, C., Matthews, P., Purkis, J., & Clay, D. (2012). The effectiveness of case-based learning in health professional education. A BEME systematic review: BEME Guide No. 23. *Med. Teach., 34*(6), e421–e444. https://doi.org/10.3109/0142159X.2012.680939