

# Application of a theory-based method in educational programs for designing persuasive eHealth: A Dutch experience

**Laurence Alpay, Rob Doms, Harmen Bijwaard**  
**Advanced Health Informatics Practice (AHIP) educational program**  
**Medical Technology Research Group**  
**Inholland University of Applied Sciences, The Netherlands**

## Introduction

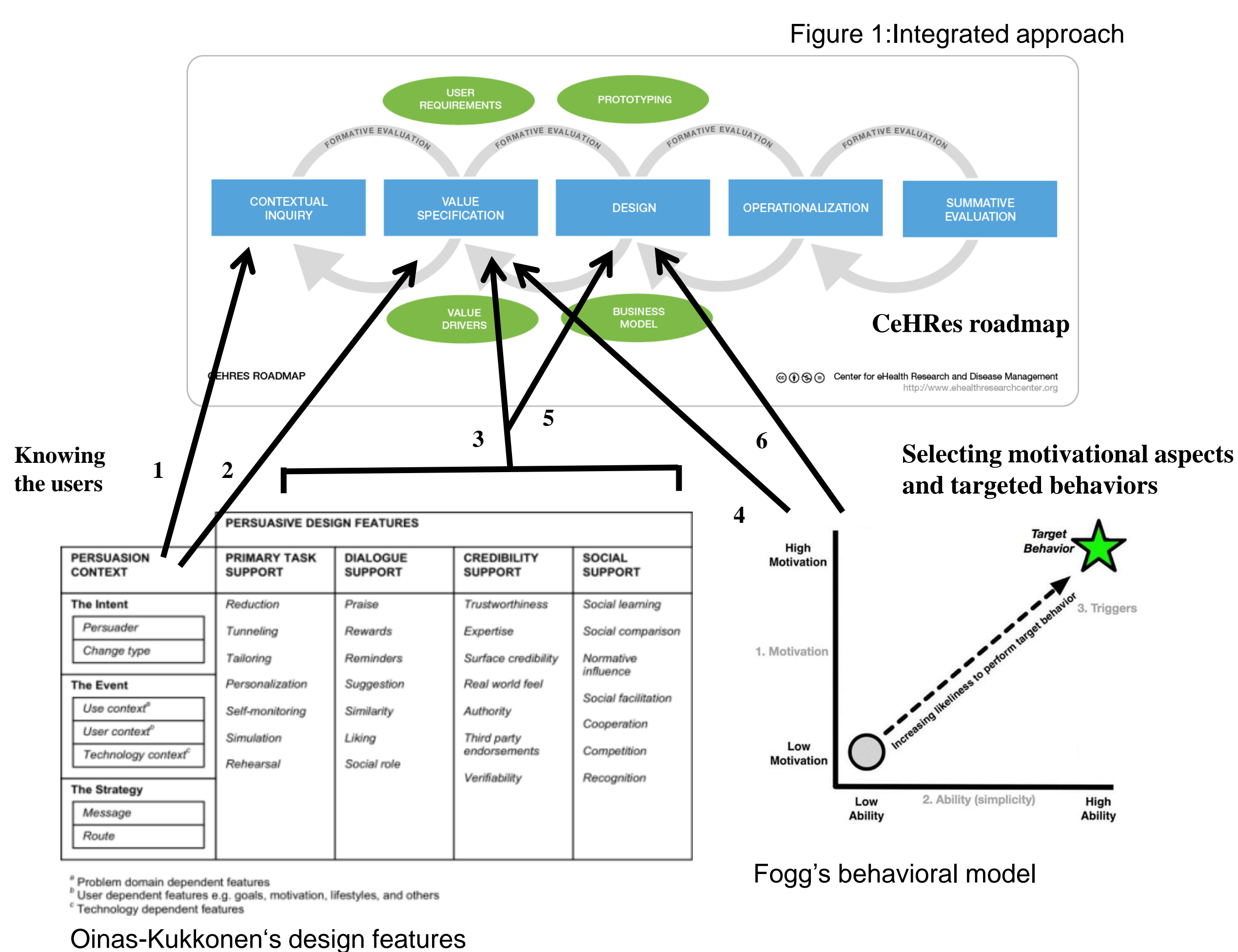
- eHealth applications for self-management are dramatically changing the way healthcare is provided and organized.
- Gap between the theories used to develop self-management systems to support patients and healthcare consumers, and a practical approach to help healthcare informatics professionals to adopt evidence-based practices.
- In the context of healthcare informatics educational programs available in the Netherlands, little attention is given to designing effective persuasive eHealth applications.

## Aim

- We propose an integrated, systematic and practical, scientifically based methodology to design effective persuasive eHealth applications.
- Integrated approach developed from a didactic and educational perspective.

## Methods

- Methodology based upon existing models in eHealth development, persuasive design, and behavioral change (see Figure 1).
- CeHRes roadmap provides general guidelines on the steps to take in designing eHealth applications.
- Using the roadmap as a basis, we make use of two models in order to explicit the aspects of behavior changes and persuasion important in designing dedicated eHealth applications.
- Model of Oinas-Kukkonen includes principles for persuasive design which allows to define the persuasive context, and to describe the targeted users, their goals, intentions and technology use. The principles are applied in the first three phases of the roadmap namely contextual enquiry, value specification (scenarios and requirements) and design.
- The Fogg Behavior Model shows that three elements must converge at the same moment for a behavior to occur: Motivation, Ability, and Trigger. When a behavior does not occur, at least one of those three elements is missing. The Behavioral grid is used during the CeHRes phases of value specification and design.



## Results

- Integrated approach applied for the module Persuasive design of eHealth within our Master AHIP at Inholland University of Applied Sciences.
- Students learn how to create a conceptual design of an eHealth application using the integrated approach.
- This eHealth application must involve a patient-centered design and one or more (health)care interventions.
- Students' assignments: eHealth applications to promote a healthier lifestyle of youngsters with weight problems, to support monitoring and self-management of pregnant women with a heart condition, to support children with syringe anxiety, to support communication with patients on an oxygen support at the ICU.

## Student's example

- eHealth application for promoting healthy lifestyles for overweight children.
- Example of requirements: the application will give the child two nutritional challenges per week.
- Examples of persuasive features:
  - Primary Task Support, personalization with favorite topics and self-monitoring of the growth curve and progress of physical exercises were selected.
  - Social Support, the student included an element of competition with points scored during the past week.

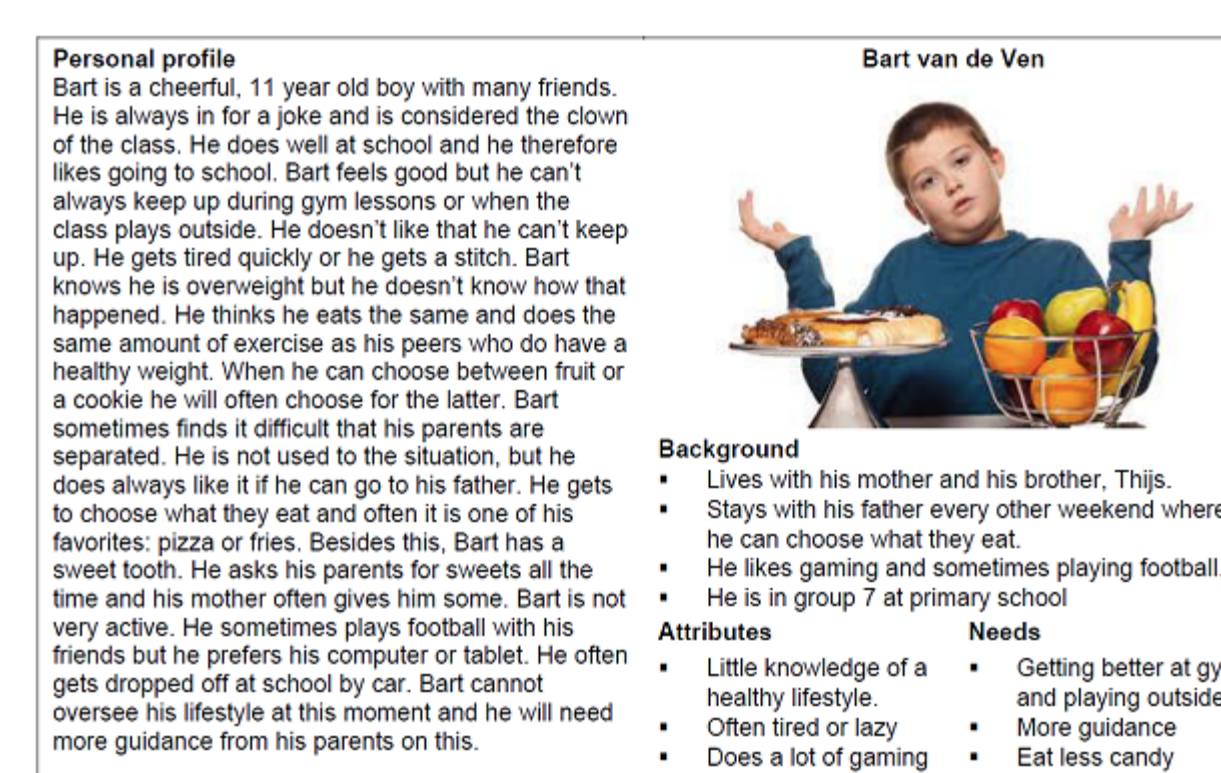


Figure 2 : Primary person

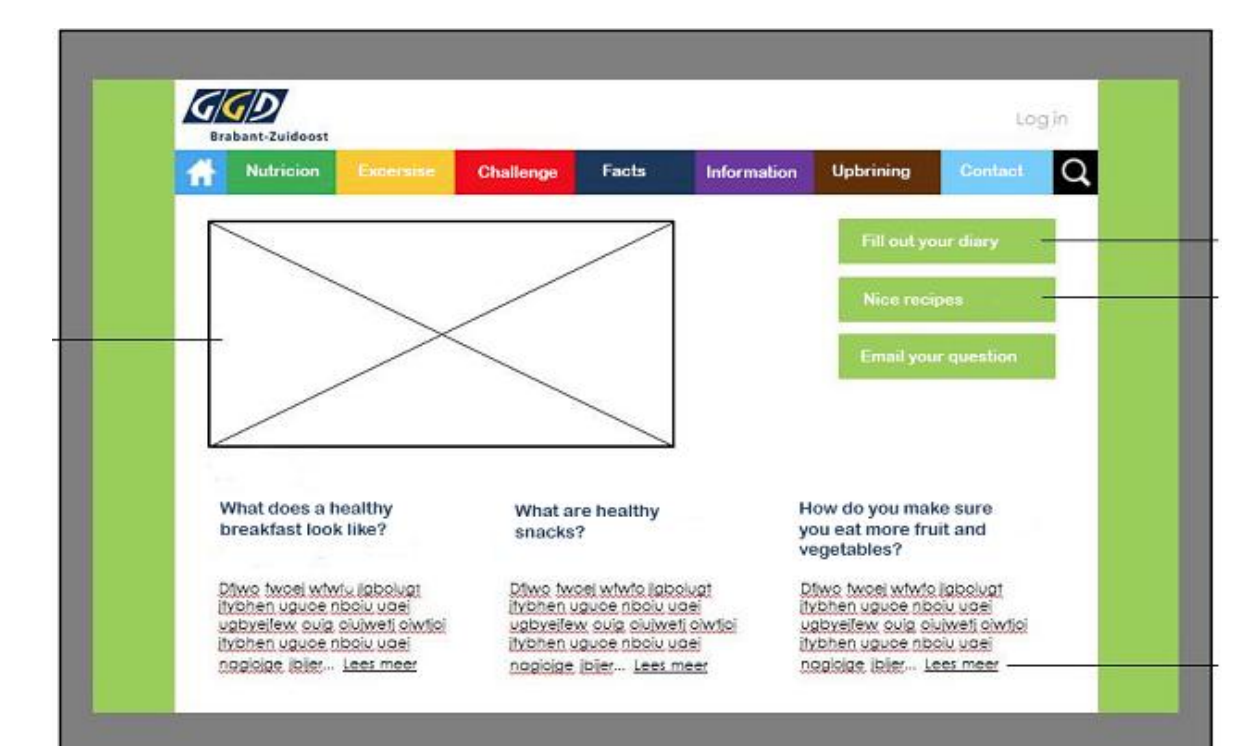


Figure 3 : Interaction model

## Discussion

- Choice of the models: sound foundations as well as practical usability in a teaching setting.
- Novelty (certainly in the Netherlands) within an educational context (universities of applied sciences).
- Complementary to other current approaches such as design thinking.
- Didactic functions
  - Cognitive function: helps students first of all to understand and learn basic concepts of the eHealth development process, of persuasive design and behavioral changes.
  - Formative function includes acquiring the skills to use these basic concepts. The module is often an eye opener for students: Designing an eHealth application is more than just designing an interface.
- Best practices: an eHealth application that is being successfully used and implemented is too often seen sufficient to be defined as best practice. However, persuasive design is one of the components for the best practice which may or may not be accounted for when defining it.

## Conclusions

- Integrated approach aims at bridging the gap between theory and practice in designing persuasive eHealth applications.
- Developed from a didactic and educational perspective and is being implemented in our master program. It enables our master students to design user-centered persuasive eHealth applications.
- Inspiring educators on how to teach design of persuasive eHealth applications and support development of best practices in this area.

Contact: [laurence.alpay@inholland.nl](mailto:laurence.alpay@inholland.nl), [rob.doms@inholland.nl](mailto:rob.doms@inholland.nl), [harmen.bijwaard@inholland.nl](mailto:harmen.bijwaard@inholland.nl)

## Bibliography

1. L. Alpay, O. Blanson Henkemans, W. Otten, T. Rövekamp, A. Dumay. E-health applications and services for patient empowerment: Directions for best practices in the Netherlands, Telemedicine and e-Health. 2010; 16:787-791.
2. L. Alpay, R. Doms, H. Bijwaard. Embedding persuasive design for self-health management systems in Dutch healthcare informatics education: Application of a theory-based method. Accepted for publication in Health Informatics Journal. 2018.
3. BJ. Fogg. Behavior Model for Persuasive Design. [http://bjfogg.com/fbm\\_files/page4\\_1.pdf](http://bjfogg.com/fbm_files/page4_1.pdf), 2009 (accessed in March 2018).
4. J. van Gemert-Pijnen, O. Peters, H. Ossebaard. Improving eHealth. Eleven International Publishing: The Hague, 2013.
5. H. Oinas-Kukkonen, M. Harjumaa. Persuasive Systems Design: Key Issues, Process Model, and System Features, Communications of the Association for Information Systems. 2009; 24(28):485-500.
6. AHIP master program. <https://www.inholland.nl/opleidingen/masteropleidingen/master-advanced-health-informatics-practice/> (accessed in March 2018).