

# Toward an Intelligent Virtual Learning Assistant through User Participation

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## Introduction and Background

Students in higher education (HE) face numerous problems, such as problems related to time management, food procurement, and accommodation. Final year undergraduate students are often overwhelmed and stressed, not only because this year is usually very demanding, but also because of the worries regarding their future (e.g. employment interviews). Recently, intelligent virtual assistants (IVAs) are becoming better and more popular. There is research showing that IVAs are successfully used in schools and universities. Researchers identified their advantages in higher education (HE), including increased efficiency of teaching and learning and generate insights on how learning happens.

This project aimed to identify what are the most common challenges that final-year students encounter and to explore how a set of Amazon Alexa skills\* can be designed to help final-year students overcome their challenges. The studies involved students, educators and human-computer interaction experts.

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\*Alexa skills are voice-controlled additional functionalities or apps created by third-party vendors. They are similar to mobile applications but developed specifically for an Alexa device.

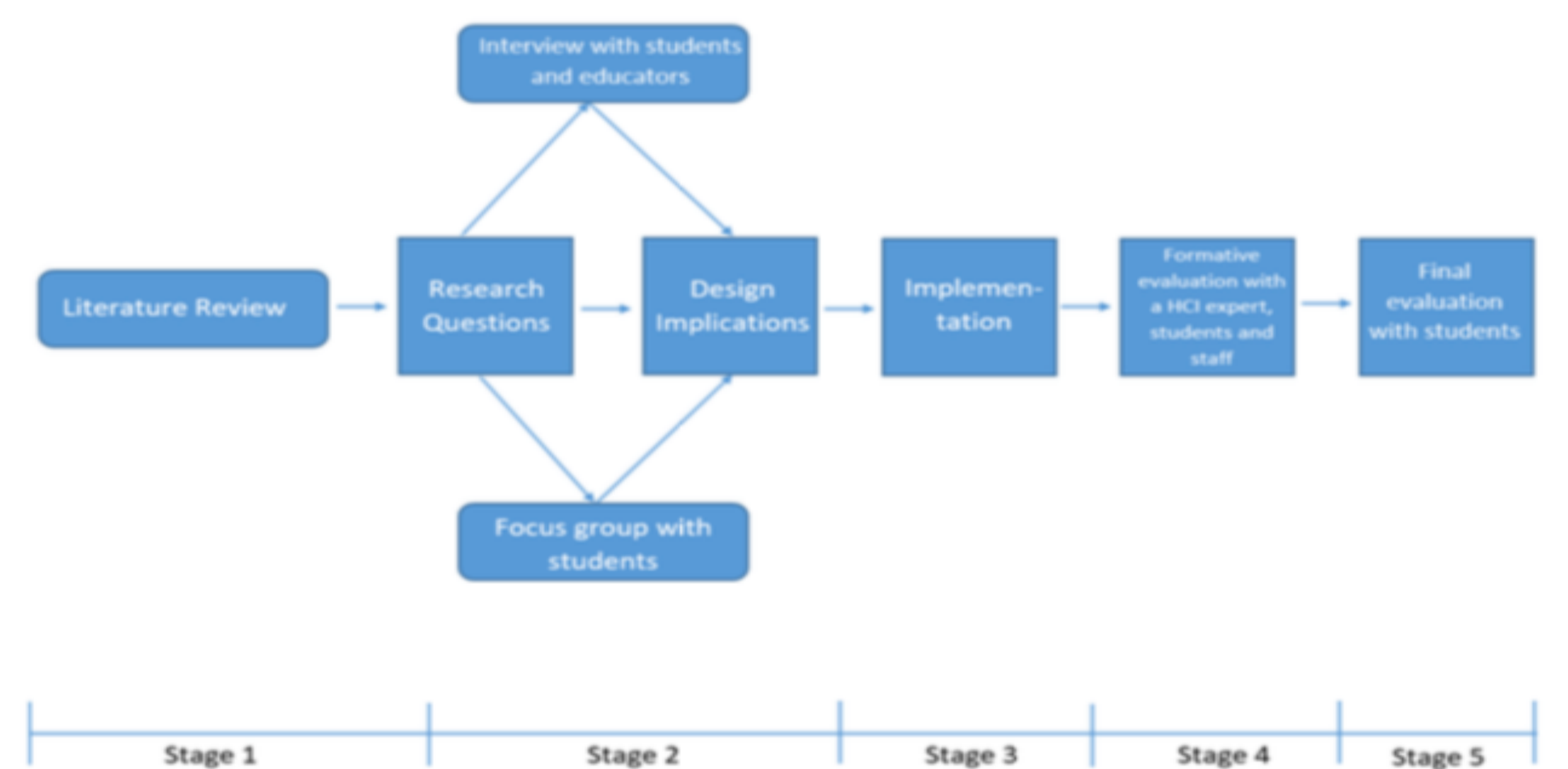
## Research Questions

RQ1. What are the most challenging problems that final-year university students have?

RQ2. How can a set of Amazon Alexa skills be designed in order to help final-year students overcome those problems?

RQ3. To what extent does the new set of skills support the final-year university students to overcome their challenges?

## Methodology



## Time management

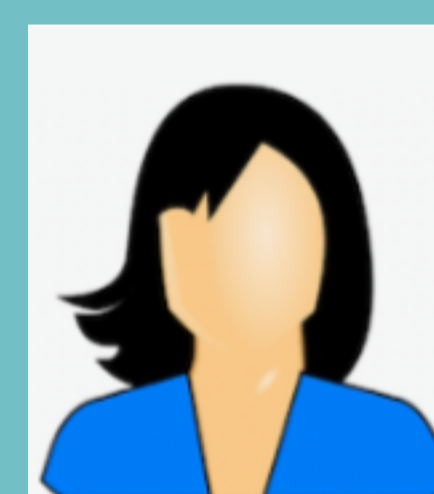


Alexa, open Student Time Tracker!

Ok, Student Time Tracker is open!



## Course Material Study



Alexa, open Course Helper!

Got it! Opening Course Helper



## Evaluation Studies and Findings

Our evaluation was conducted in 2 stages:

- Stage 1: involved **16 participants** (14 students, 2 staff members)
- Stage 2: involved **11 participants** (3 recently graduate students and 8 undergraduate students) covering Computer Science, Business and Graphic Design fields. Three of these explore the skills at home, for 2 days.

The goals of the evaluation study were to **identify the reactions** of this audience to the new Alexa skills, **evaluate their potential to engage the user, their effectiveness**, and to **elicit suggestions** to improve them.

Our findings revealed that the idea of supporting the final-year students with time management and course material study (two common challenges that were prioritized by students) through Alexa skills **was positively received** by all participants.

**Usability:** The overall System Usability Scale score for all participants (M = 80, SD = 12.39) was in very close to the boundary between good and excellent ( an excellent score is >80.3)

**Perceived Engagement:** All participants completed the tasks and most of them were curious to explore more.

The three students who explored the skills at home spent 30 minutes per day on average. It is essential to mention that this time represents only the time when the skills were active, meaning that the user interacts with them. If for example, the student wanted to start a timer for a course, and then they started studying, the time did not include the time the participant was studying. They only included the time the student was speaking with the system.

**Perceived Effectiveness:** There was a consensus in the perceived effectiveness of the skills.

*"I were using the skills for two days now. After using the time tracking skill, I now know the exact time I am studying for a course. The report is very helpful. It tells me if I have to study more. The skill for the course material makes random tests every time. I see a lot of advantages for the students."* (P3, student)

**Suggestions:** Several suggestions were collected, including integration of the skills with a smartphone application, flexibility of the utterances, use of Natural Language Processing to compare the 'correct' answer in the open-ended questions with the one during the student test, extend the skills by using visual features (on Amazon Echo).