

Attracting Future Female Computer Scientists: Hands-On AI Workshops for Girls as a Pathway to Higher Education

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Introduction

The field of Artificial Intelligence (AI) is rapidly gaining public attention with its everyday applications, not only to economic institutions but also for private individuals. Increased interest can be observed among young people in particular: a German survey showed a significant rise in interest in new technologies in this area among young people aged 12 to 19. 83% of the boys and 79% of the girls[6]. In order to meet this rapidly growing demand and ensure (further) development in the AI landscape, more specialists with a sound education in Computer Science (CS) are needed to design and train good models in the future. This need contrasts with the only moderate increase in the number of Computer Science students, particularly the stagnating growth of proportion of women studying CS in Europe is usually ranging between 10% and 20%[3]. With regard to the development of unbiased and fair models and training with qualitative data, women are needed more than ever in the field of CS[5].

Programm Development

In order to meet this challenge, the increasing interest of female secondary school students in AI topics should be utilized and transferred into an interest in studying CS. In order to achieve this, we are designing hands-on workshops for female students aged 17 and over, which focus on the topic of AI and teach in-depth learning content, to enhance AI Literacy. To bridge the gap between existing informal interests and academic study in CS, we develop workshop formats lasting several days. These workshops aim to promote a foundational and critical understanding of artificial intelligence and the concepts behind (AI Literacy). Thereby, we focus on the integration of theoretical knowledge with practical, hands-on experiences and the application of these contents to real-world problems.

Methodology

Our research model (1) draws on Ajzen's theory of planned behavior (TPB)[1] [5], explaining behavioral intentions by the influence of one's subjective norm, attitude, and perceived behavioral control. Subjective norm refers to the individual perception of how relevant gatekeepers, such as parents, teachers or friends, assess their own suitability with CS studies. Attitude refers to the own perception that studying CS will have positive effects on individual outcomes and self-development. Perceived behavioral control refers to the individual evaluation of the difficulty or ease of studying CS.

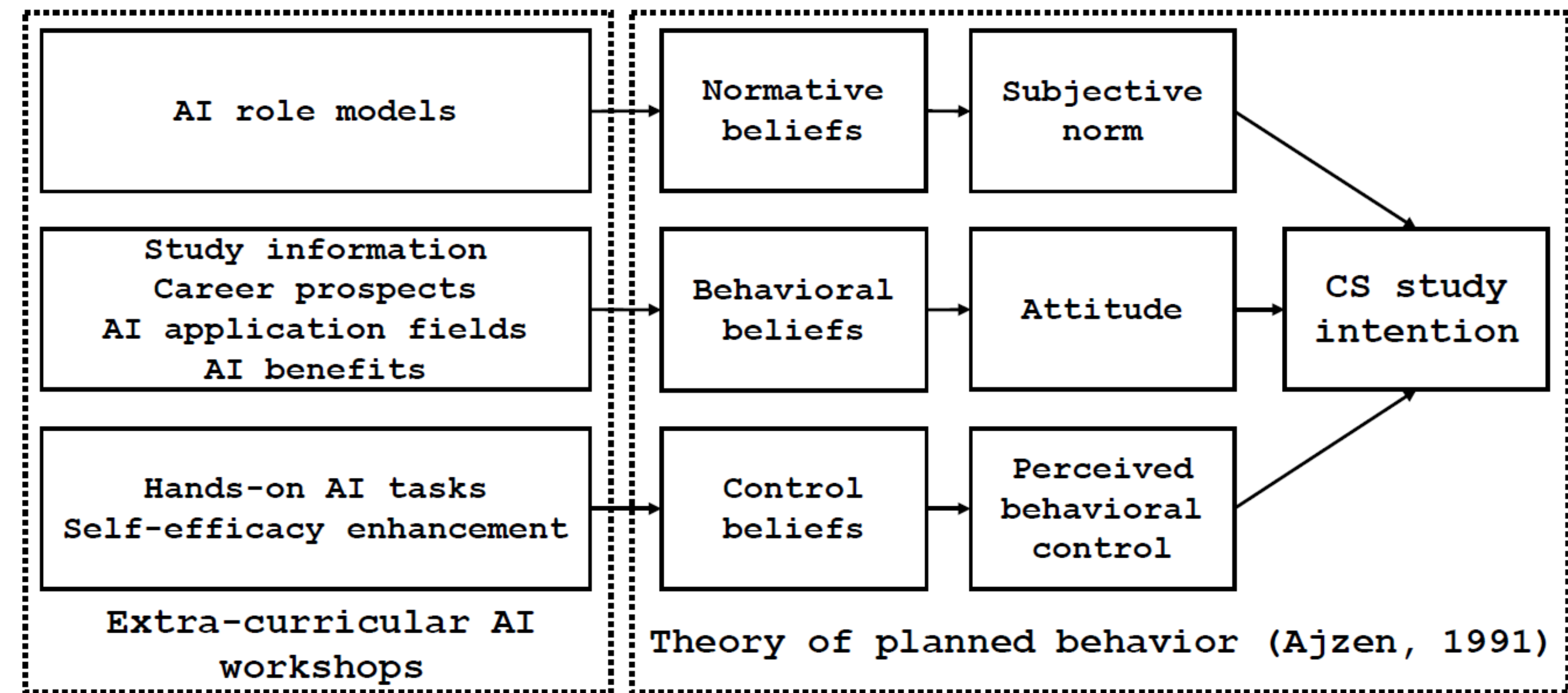


Fig. 1. : Research model underlying the workshop design based on the theory of planned behavior (TPB)[1]

Based on the TPB model we designed our extra-curricular AI workshops to address all three aspects: During the workshops, we introduce biographies of various women who are well-known AI developers as well as female AI researchers. Furthermore, current female CS bachelor students are invited in person to the workshops to report about their studies, experiences and goals. We assume that this has a positive effect on the formation of normative beliefs, which leads to higher subjective norm and increases the intention to study CS[4]. In addition, our workshops provide relevant information on studying CS, career prospects and present many different areas of AI for common good [2] from application areas of healthcare, environmental sustainability, and education. We assume that such information strengthens behavioral beliefs in order to develop positive attitudes towards studying CS. The core of our workshop program is in depth-presentation of AI concepts and methods illustrated via the named application areas and tasks are instructed and carried out hands-on. The practical experience, which is accompanied by explicit positive feedback, contributes to the development of a high level of self-efficacy. This strengthens control beliefs, which in turn have a positive influence on perceived behavior control and the intention to study CS.

Structure and Evaluation

The series of workshops starts in summer 2025 and will be offered for a duration of two years to different groups of about 15 girls each. The assumed positive effects of our program will be evaluated using pre-post-questionnaires measuring belief updates following the TPB framework.

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