Cross-Cultural Design for Employability: Mobile Support for Healthcare Professionals

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Abstract. Supporting migrants in entering host societies is a challenge. In Sweden, influx of migrants resulted in problems with access to in-classroom Swedish language courses for migrants in general, and for health care professionals (HCPs) in particular. Due to its accessibility, mobile technology can be a bridging tool between migrants and host societies, providing an alternative/complement to classroom teaching.

This study reports on the non-European HCPs' employability needs, and how these needs can be met by a mobile application. A qualitative methodology based on semi-structured focus group interviews and interactive workshops with HCPs, mentors and language teachers is used to (a) investigate the HPCs' needs; (b) discuss the content and the design of a mobile prototype application (app) for supporting labour market integration of HCPs. Further, based on the findings, a prototype is created for user testing. Thematic content analysis is used for analysis of the data from the focus groups and workshops. Descriptive statistics is used for the analysis of questionnaires for prototype testing.

The results show that the HCPs need a targeted language and culture training as well as opportunities to develop contacts with Swedish HCPs. Further, a roadmap for the main steps needed to get a medical license is requested. The users are in general positive about the prototype. The results suggest a possibility of cultural impact on design preferences.

The study gives suggestions for developing a mobile app for enhancing integration of HCPs in the Swedish labor market, which can potentially be further developed for other professional groups.

Keywords: Migrants · Healthcare professionals · Mobile technology
Application design · Employability

1 Introduction

1.1 European Migrant Crisis 2015–2016

In 2015–2016, over 1.2 million first time asylum seekers were registered in Europe, the majority coming from Syria, Afghanistan and Iraq [1]. Host societies meet many challenges in supporting migrants' integration [2]. Providing equal opportunities for all members, regardless of their background, and to enable and motivate newly arrived

P.-L. P. Rau (Ed.): CCD 2018, LNCS 10911, pp. 314–326, 2018.
https://doi.org/10.1007/978-3-319-92141-9_24

migrants to participate in the life of host society is essential for preventing social exclusion [3].

Early language training in combination with labour market entry are the cornerstones of successful integration [4]. Due to the large number of newly arrived migrants in Sweden, providing access to in-classroom courses has been challenging, which resulted in an increase in development of online language courses and mobile apps to meet the needs [5]. However, though a variety of apps are available for both language learning and societal information [6], few provide a targeted language training for highly skilled migrant professionals in general, and for health care professionals (HCPs) in particular [7].

1.2 Healthcare Professionals (HCPs) in Sweden

Though in Sweden "Swedish language for immigrants" courses are provided free of charge, little attention has been paid to migrant diversity in terms of educational and professional background [8]. Targeted training courses for highly skilled professionals, which include both professional and language training, are few. Some examples are *Korta vägen programme* ("Short way") for doctors, nurses, pharmacists, biomedical analysts, teachers, and engineers, *Korsvägen* ("Crossroad") for teachers, and supplementary education for HCPs (primarily doctors) in Sahlgrenska Academy, Gothenburg, Lund University, Lund, and Karolinska Institute, Stockholm. Today, it takes 4 to 6 years for doctors coming from outside the European Union to enter the labour market in Sweden [9]. Validating education, passing Swedish language test, medical licensing examination and managing internship to fulfil the requirements for Swedish medical license is a lengthy process, which results in frustration and losing professional skills [10]. Further, those HCPs who get the license and start working report communication problems in interactions with patients and colleagues, which often result in patient complains, stress, discrimination, and exclusion from decision making, etc. [11].

2 The Aim of the Study

The study investigates the needs in terms of employability and integration into the labor market of HCPs with a medical degree outside the European union and how these can be met in a mobile application. Research questions include:

1. What professional needs in terms of integration into the labor market do the newly arrived HCPs have?
2. How can a mobile app be designed taking into account cross-cultural design aspects to support the transition to employability in the new country?

3 Background

3.1 Integration and Mobile-Assisted Learning

Integration is the acculturation strategy when migrants have an interest in both maintaining one's original culture and learning the culture of host society [12]. Integration can only be "freely" chosen and successfully pursued by non-dominant groups when the dominant society "is open and inclusive in its orientation towards cultural diversity" [12]. Getting employment together with education, housing and access to healthcare are essential markers and means of integration, which can be facilitated by language proficiency and cultural knowledge [13] as well as contacts with the members of host society [14].

Many immigrants have smartphones and use them for keeping in contact with families back home and geographical navigation [15, 16]. Mobile technologies enable portable, networked and new contexts of learning [17, 18] promoting progressive, authentic, interactive and social learning environments [19].

A number of mobile applications (apps) have been developed in the countries that accepted large numbers of migrants, e.g. Germany, the UK, and Sweden to supply migrants with different kinds of information. In Germany, *Ankommen* app [20] contains a basic German language course, societal information (food, labour market, housing), overview of the asylum procedure, transportation, child care, and other relevant information for newly arrived migrants. In Sweden, *Welcome* app was created by volunteers in 2015 to enable contacts and networking between locals and migrants via chat and social events [21]. In the UK, within MASELTOV (Mobile Assistance for Social Inclusion & Empowerment of Immigrants with Persuasive Learning Technologies & Social Network Services) project, smartphone services to support geographical navigation and development of communication skills to enable a situated incidental language and culture learning integrated in a prototype app (*MApp*) for immigrants were developed [22]. In another British project, SALSA (Smart cities and language learning), the city's network infrastructure and language learning solutions for immigrants through smartphones were developed [23, 24].

Few studies offer a systematic review of the mobile applications for immigrants. Berbyuk Lindström et al. [7] and Sofkova Hashemi et al. [5] show that there are distinct discrepancies in relation to the available resources on the market, their use and the newly arrived migrants' needs. Most of the mobile resources in the Swedish market are language training apps, e.g. *Duolingo*, *Lingio*, *Hej svenska* (Hello Swedish), which are weakly related to the migrants' social and economic integration needs, i.e. managing employment, education and accommodation. It results in lack of motivation for learners to use them regularly [19]. Further, little attention has been paid to the targeted mobile assisted support for migrants from different educational and professional backgrounds as well as to cultural aspects both in terms of app content and design.

3.2 Cross-Cultural Design and Development of Mobile Applications for Migrants

Since the world is becoming more globalized, paying attention to cultural differences (and similarities) among people is essential. To design mobile applications successfully for people with different cultural backgrounds, sensitivity to cultural nuances is needed [25, 26]. Awareness of cultural differences can especially be important in designing mobile apps for newly arrived migrants, many of which suffer from stress and anxiety, in order to support their interest and motivation to integrate and to ensure product usability.

Culture can be defined as "the collective programming of the mind that distinguishes the members of one group or category of people from another" [27]. Kroeber and Kluckhohn consider even "distinctive achievements of human groups, including their embodiments in artefacts" as elements of culture [28]. Though often criticized [29], Hofstede's framework, composed of six main dimensions, is broadly accepted and used in relation to user-interface design [30, 31]. The dimensions include *power distance* (acceptance and expectance of unequal power distribution), *uncertainty avoidance* (tolerance for ambiguity), *individualism versus collectivism* (expectations of connections between people), *masculinity versus femininity* (preference for achievement vs cooperation), *long- versus short-term orientation* (relation to past and future) and *indulgence versus restraint* (free versus suppressed gratification).

Hall theory of High- and Low context cultures [32] is also used in relation to design, e.g. in the use of visuals [33]. According to Hall, cultures differ in the extent to which the environment, more specifically, social context (i.e., the network of social expectations that determine a person's behavior) is meaningful for communication. Hall divides cultures into high-context (HC), represented by the Japanese, Arab, and Mediterranean cultures. The low-context (LC) are the Swiss, German, Scandinavian (except Finland, which is an HC culture [34]) and North American cultures. Compared to LC, HC communication is less verbally explicit, little is the coded, transmitted part of the message. LC communication, on the contrary, is characterized by more reliance on verbal communication.

4 Methodology

First, to address the research question 1 (RQ1) concerning the integration needs, the 1st interactive workshop (3.5 h) was organized. Working groups consisting of 17 participants (10 newly arrived HCPs, doctors and nurses, 2 coaches, 2 course managers, 2 Swedish language teachers and an employment agency agent) explored the needs and concerns the non-European HCPs had in various stages of the process towards employment. The research question 2 (RQ2) concerning the app design was addressed in the 2nd interactive workshop (3 h), when the participants from the 1st workshop could discuss and visualize their ideas (Fig. 1).

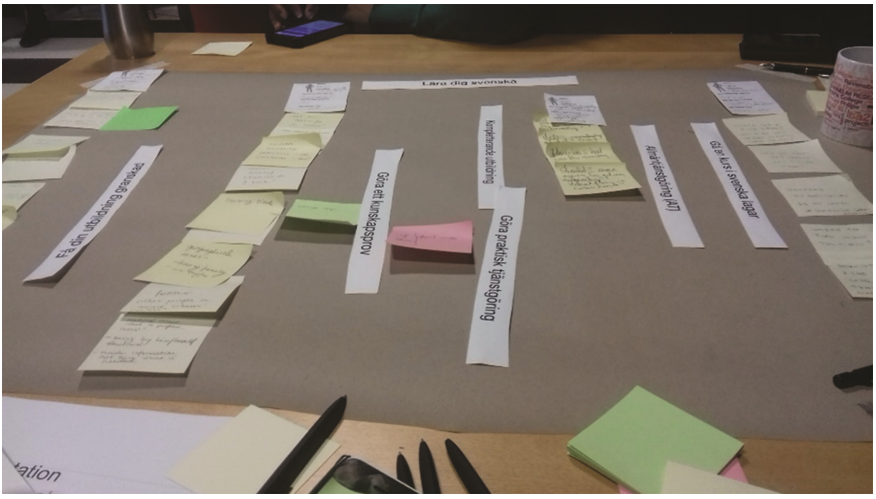

Fig. 1. Workshop 2: Brainstorming about visualization of the way to the Swedish medical license

Further, nine focus group interviews with HCPs (6.7 h) were conducted focusing on both RQ1 and 2. Apart from the newly arrived participants from the workshops, 11 participants from the *Korta vägen*-courses were involved. In total 21 Arabic-speaking HCPs (12 males and 9 females), primarily doctors, pharmacists and dentists, enrolled in preparatory courses, participated in the study. The majority of them were between 26–45 years old, came from Syria (17), Iraq (3), and Algeria (1) and spent between 1,5-3 years in Sweden.

Both workshops were based on participatory design principles [35], where participants used tangible materials and co-creative practices to explore possible future supports [36]. The focus group interviews and the workshops were carried out in Swedish and English. The focus group interviews were audio-recorded and transcribed. The workshops were documented using field notes, video-recordings and photos.

Thematic Content analysis [37] was used for the analysis of focus groups and interviews from the workshops. Each project member read two transcripts and identified the themes related to use of the app and integration needs to develop a preliminary coding scheme. It was then applied to two more transcripts. A working coding scheme was developed and applied to all transcripts. Differences in coding were resolved during the team meetings, and the themes were identified.

Based on the analysis of data, a prototype was created using React programming language [38] and tested three weeks after the workshops. After a brief introduction of the prototype, 22 HCPs (including five participants from the interactive workshops and the interviews) were asked to freely explore the prototype and answer the questionnaire related to design and content. In conclusion, a brief collective discussion was held about the participants' impressions.

The project was approved by the Ethical Review Board, Gothenburg, Sweden. Prior to conducting the study, all participants got information from the project group in both oral and written form. All involved participants gave their written consent for

participation. Anonymity was emphasized as well as the possibility for the participants to withdraw from the project at any point. The participants' names and other material facts, such as place names, identification numbers, etc., were altered to preserve their anonymity. As the project is related to the Swedish Migration Agency, the participants were ensured that their participation would not affect their status in any way, e.g. residence permit, benefits, etc.

5 Results

5.1 RQ 1. Integration Needs in Relation to Employability of Newly Arrived Migrants

In regard to integration needs in relation to employability, three main themes emerge in the data:

(1) getting a clear picture of career steps to get a Swedish license to practice;
(2) developing contacts with Swedish HCPs and
(3) learning the language and culture codes in relation to the Swedish healthcare context.

Theme 1. Getting a Clear Picture of Career Steps to Get a Swedish License to Practice. Getting a picture of what steps to take in order to get a Swedish license to practice is one of the central needs mentioned by both the HCPs, their mentors and teachers. The entire process is perceived as quite difficult and confusing to keep track of. Though much information is available online in text form, it can be complicated to find and to understand it due to language problems. Information about validation of medical education, the structure of the Swedish healthcare system, the information useful for passing the medical licensing examination and getting internship is essential.

Theme 2. Contact with Fellow HCPs from Sweden. The majority of HCPs feel isolated. Many report little or no contact with the Swedes in general, and with the Swedish HCPs in particular. Some reasons for getting more contact with the locals are: (a) getting the information and support concerning to the aspects mentioned in Theme 1; (b) learning the Swedish language and cultural codes in general, and in relation to healthcare context in particular (Theme 3 below); and (d) finding an internship. Many HCPs believe that "referral is important here in Sweden, you need a reference, it can help you to solve your problems," e.g. to get an internship.

Theme 3. Learning the Swedish Language and the Cultural Codes. The participants emphasize that, apart from learning the Swedish language in classrooms, additional training is needed in relation to the Swedish cultural values. Many respondents report having no/little insight in the Swedish healthcare communication and expressed anxiety about managing cultural differences when they get an internship.

Hierarchy, doctor and patient roles, decision making, trust, gender, family role, expression and recognition of emotions, conflict management and ethical challenges are mentioned as especially challenging by the HCPs.

5.2 RQ 2. Prototype Designing and Prototype Testing

Prototype Designing. On the question about designing the app, the HCPs report a strong need to visualize the career steps (related to Theme 1). An interactive roadmap is suggested to contain different paths which can lead to license and a short information about each step. For instance, providing sample tests for the users "to be able to study after the courses" is mentioned by the participants.

Developing a contact making function to support getting in touch with Swedish HCPs (Theme 2) is also requested. The respondents consider initial contacts via chat being the easiest way, requesting voice messaging and video-chat functions for developing further contacts. Many perceive written chats as impersonal and "childish."

Concerning Theme 3, the respondents believe that video-recorded dialogues, embedded in the app can be used for both language and cultural training. Consultation structure, communication in different stages of consultation, illustrations of bodily communication are suggested to be included in the app.

Analysis of the data resulted in a prototype. To meet the needs of Theme 1, a" roadmap" to support the HCPs on their way to license, based on the requirements from National Board for Health and Welfare (see Figs. 2, 3, 4 and 5 below) was designed. Three main "paths to license" are distinguished, presented below. The prototype contains 4 tabs with a roadmap for the three different paths to medical license, including knowledge test (Fig. 2), getting an additional education (Fig. 3) or the Swedish medical education (Fig. 4). The fourth tab (Fig. 5, All Roadmaps) is a merging of the three different paths with the purpose of providing a holistic picture for the users which options exist and how the three different paths differ.

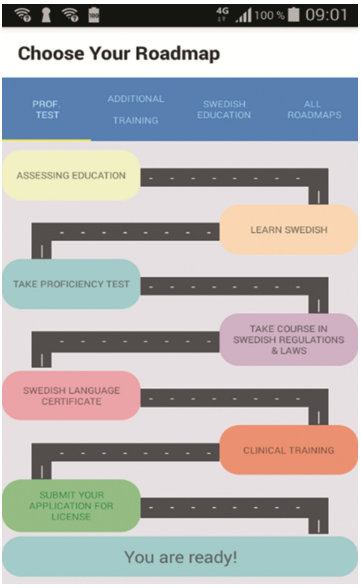

Fig. 2. "Medical knowledge test"

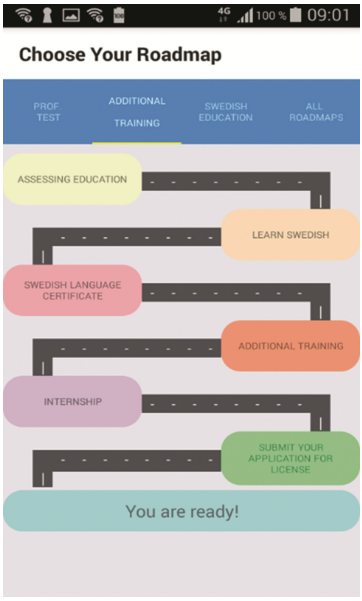

Fig. 3. "Additional training"

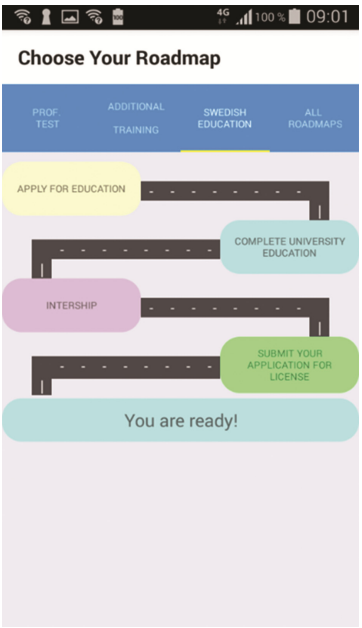

Fig. 4. "Swedish education"

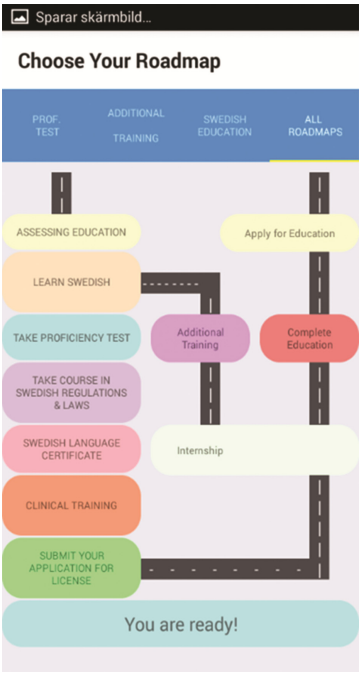

Fig. 5. "All roads"

For more information, the user can click on the steps in the map (see Fig. 6). This will show a new page with a short description of the step, other relevant information, tips, and the links to other web resources.

To address the Themes 2 and 3, the links to video-recordings are made in the step "Learn Swedish." A short video-recording of interaction with a transcript, vocabulary section, a word list with medical terms (Swedish-Arabic) and a space for comments about the cultural aspects, e.g. eye contact and touch, with links to a discussion forum are designed.

Prototype Testing. During the testing, the majority of the respondents (72%) report a better understanding of the process for getting a medical license after using the prototype, while 9% answered "maybe". Regarding the information that the participants lacked, many comment on providing more information about medical licensing examination and internship.

More pictures and increased font size to ensure readability are also mentioned by some HCPs (23%). Some respondents suggest that the colours can be improved to reinforce the connection between different steps. Medical language quizzes, sample medical tests with a forum for discussions are suggested to be further developed.

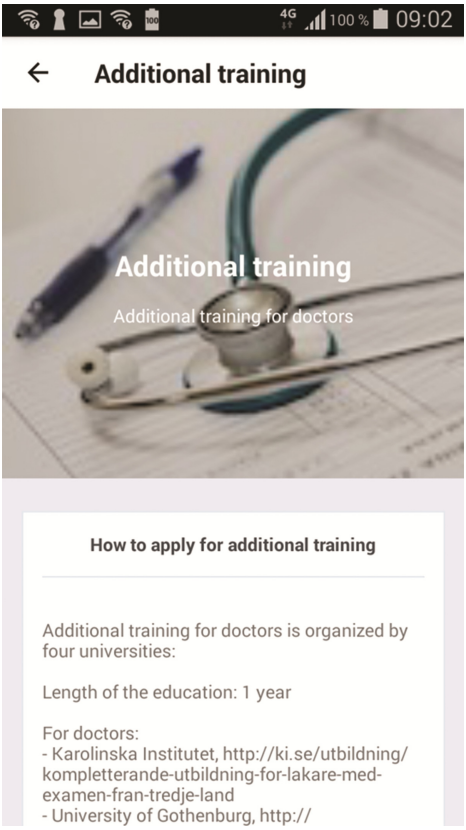

Fig. 6. Information about additional training

6 Discussion

Today's migration is characterized by the vital role technology plays for millions of migrants. About 86% of Syrian young people in refugee camps have smartphones [39]. Upon coming to the host countries, smartphones can be used for supporting migrants in learning a new language, acquiring a new culture, getting employment/education, managing housing, as well as contacts with locals.

The results of the study show that getting employment is the primary concern for the migrant HCPs. One of the main obstacles is lack of knowledge what steps to take in order to fulfil the requirements for medical license. Sweden is a highly technological society, and much information is available online, from different sources, which can be complicated to search for and to understand by newly arrived migrants with limited Swedish language competence. It might partially explain the HCPs' need of providing a simplified visual "roadmap" of the process.

Making contacts with fellow Swedish HCPs is emphasized by the HCPs as well. Sweden is characterized by individualistic cultural values [27], favouring independence,

loneliness and solitude [40], while the HCPs in this study come from more collectivistic countries (e.g. Syria and Iraq [27]), in which making contacts is somewhat easier. This cultural difference, together with language problems, might be a possible reason for the problems related to making contacts and requesting mobile support to solve them.

Learning the language and culture codes in relation to the Swedish healthcare context, e.g. videos, pictures, quizzes, were also mentioned by the participants. As the respondents report limited opportunities to work/practice in Sweden and little/no contact with the Swedes, a mobile app is perceived as a possible source of information about the Swedish healthcare context.

Concerning the prototype design, the Arabic HCPs expressing wishes for video and voice chat might be related to cultural factors, such as preferences for face-to-face communication and developing relationships common for HC societies [32, 41]. Further, it can also be related to language competence, as possibility to see an interlocutor can contribute to better understanding in communication. As the application is aimed to be used for communication between Swedes and non-Swedes, attention should be paid to the preferences of Swedish users as well. Taking into account that Sweden is a relatively LC culture, the Swedish users might (though not necessarily) show preferences for written distance communication. Thus, designing mobile applications, understanding of users' characteristics and their immediate needs are essential to ensure usability [42] which might become increasingly complex when the users are from different cultural backgrounds.

7 Conclusions

This study explores the needs of the non-European HCPs and design of mobile application for supporting their integration in the Swedish labor market. Results indicate that the designers should take into account the users' design preferences, some of which can be related to their cultural backgrounds. Further studies can be done to get a better picture of the HCPs needs, develop the design and test the usability of the application.

Acknowledgments. The study was conducted as part of the MInclusion research project: Integration with mobiles, minclusion.org. The author wishes to acknowledge the support of the Asylum, Migration and Integration Fund (AMIF), Chalmers Innovation and Rise Interactive. The author is particularly grateful to the respondents for their participation and to the project members for providing their advice in the research.

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