

Yes! I Want My Non-Cognitive Skills to Be Improved: Perceptions on an ICT-Enabled Learning Journey

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Abstract—Non-cognitive skills (NCS) are important for personal development and enhancing employability. However, as related literature points out, designs for NCS development are challenged by their fidelity, complexity, technology pedagogy and content value, user-centricity and so forth. Thus, this study investigates on 1) how do individuals recognise their needs, challenges and motivations for improving NCS, and 2) how do they envision their individual roadmap towards NCS achievement. An exploratory strategy is followed in capturing the learners' perceptions. Expected data were collected by a questionnaire aiming at a sample of 80 purposely selected employable adults, followed by interviews with 11 randomly selected individuals among the sample. The outcomes provided feedback towards optimising design concepts for an NCS learning environment. Consequently, the framework for NCS improvement must include components, in the order of importance, tools for assessment of NCS, premises for learning NCS, dynamic CV, and linking to the occupations of individual interests as envisioned by the respondents. The participants recognised the significance of NCS and that NCS contribute meaningfully to their personal and professional growth. As such, research efforts shall be invested in evaluating the methods and tools in a systematic user-centric process to determine their effectiveness and impact in lifelong learning.

Keywords—non-cognitive skills, NCS, assessment, lifelong learning, technology mediated learning, user perception

1 Introduction

Traditionally, formal, informal and non-formal education aim at acquiring knowledge in selected typical subjects. Learning these subjects often connects to mastering skills mediating the thinking, reasoning, focusing, memorising, and understanding etc., which are essential components for better performance in formal education. Such cognitive abilities of computation, language, writing, and so forth, are popularly known as cognitive or hard skills. Education curricula pay attention to developing these skills, and are systematically improved as a part of knowledge construction in different subject areas [1]. However, Leadership, Tenacity, Adaptability and several other 21st

century skills were recognized as important for effective participation in a digital society [2], [3]. Non-cognitive skills (NCS) are an essential part of these skills [4]. For a society to be innovative and to contribute to economic growth, adequate supply for the demand of these skills is required as pointed out in the European Union new skills agenda [5], [6]. But a question often followed is how and in which ways the NCS are taught, acquired and recognized [7]. Contemporary academic curricula place NCS improvement at its least priority [2], [6], [8], [11]. Since employability of individuals is heavily dependant on the level of their NCS [6], [8], [12], it is inevitable that the NCS should be acquired at some point in the line of qualifying for a certain employment. Acquisition of NCS becomes more challenging when the target group is employable adults [13]. Hence, when the learners are restricted in time and opportunities to enhance NCS in a formal education setting, alternative possibilities to enhance their NCS become essential [14], [15].

A potential way forward is to provide informal, non-formal or lifelong learning possibilities [3], [5], [8], [16], [17]. The existing approaches to creating comprehensive technical and non-technical solutions to address this question however, are ad-hoc [6], [8], [10] and lack the evidence of designing them taking the perception of the beneficiaries of these services into account. The essential drawback of such top-down solutions created *for users* are that the users may require to understand how the provided facilities could be mapped to their exact needs, prior to crafting their learning goals within such solutions. Instead, learning solutions created *with users*, taking into account how they value and recognize the need for enhancing NCS and how such learning benefits individuals in meeting their life goals are shown to be productive [2]. Furthermore, Learner centricity and demand driven learning are critical for increasing learners' motivation and hence the learners' performance, especially when skills development solutions are not offered as a mandatory component of formal education [7], [8], [18].

The challenge becomes severe when the solutions incorporate technology mediated approaches, due to gaps in digital literacy [6]. European Commission funded cross-border large projects under initiatives such as DG CONNECT and DG GROW aimed at bridging the gap of demand and supply of the skills in the digital age [6]. Under these initiatives, designs for lifelong learning are sought out to overcome the problems of upskilling employable adults. This empirical work has been conducted as a part of a DG CONNECT project SkillsMatch [19] and intends to bring value to the existing knowledge domain of NCS by introducing a prior step to design of a learning solution; i.e., systematically capturing how users envision the ideal services for improving NCS and how such services are instrumented for optimising the support for achieving individuals' goals in perceiving NCS. Therefore, the aim of this study is to investigate the factors behind the users' motivation on learning and assessing their NCS, and how they want digital support to interplay in this endeavour. Following research questions are thus formed, 1) how do individuals recognise their need, challenges and motivations for improving NCS, and 2) how do they envision their individual roadmap to NCS achievement. In setting up this empirical study, a primary assumption is made, based on existing evidence described above, that online and learner centric solutions are often risked by the lack of motivation of the users to achieve learning goals, and therefore it

is essential to understand the factors that motivate users to follow technology mediated solutions prior to designing such solutions.

The rest of the article is organised as follows. The next section provides a comprehensive overview of NCS and their value and role in the overall professional development. Section 3 briefs about the methodology followed in crafting this empirical study. Section 4 summarises the outcomes of the study in a light of how it addresses the research problem focused in this article. The outcome of the study compared to the existing knowledge, as well as the lessons learned in the process of conducting this research is discussed in Section 5. Finally, Section 6 provides essential concluding remarks and potential further extensions of this study.

2 Background

As previous studies pinpoint, NCS are of interest in lifelong learning due to the NCS' association with continuous personal development and employment success throughout an individual's life [7]. However, the NCS training and especially the provision of NCS development systems such as mentoring and specialist programmes and courses, are demanding [20]. Studies highlight the need for future research on standardising NCS development and not keeping it in a "hidden curriculum" within schools and universities [8]. Furthermore, the formal education measurements have been standardised with scores such as Grade Point Average (GPA) or with European Credit Transfer System (ECTS). Language tests such as the Test of English as a Foreign Language (TOEFL), Intelligence Quotient tests (IQ) and so forth measure various cognitive abilities of a person. But the NCS which are equally demanding in the labour market, have still to achieve such standardisation [11]. Furthermore, in the light of increasing mobility and migration, recognising, validating and certifying skills within formal education is challenging, where a solution may reside within non-formal education [15], [21]. Such qualifications are often invisible, and employers usually base recruitment decisions on formal, school and university qualifications. In contrast, decisions to lay off staff are often based on their team-work skills and work approach [22]. Therefore, validation of skills is of high necessity as it has consequences for the life of immigrants, especially for those who are low-skilled [3], [12]. This calls for action in the area of recognition and validation of non-formal learning and NCS skills to empower individuals to engage in lifelong learning [2], [12], [19].

According to [5] NCS are considered as key skills for employability both from the perspective of graduates and employers. However, there are major differences in the prioritisation of NCS between graduates and employers, showing a need to increase students' awareness and self-responsibility in developing the appropriate NCS skills for employability in the changing labour market [17], [23], [24]. The absence of information on *which* are the NCS required for a successful professional performance hinder employability [24], [26]. Furthermore, regardless of the methods of assessments of NCS, i.e., online or paper based, the scores may be alike. Studies provide analysis on widely used psychological tests in schools and professional training programs inferring

that traditional tests conducted online have similar results to their paper-and-pencil versions for assessments, with additional advantages being their effectiveness (lower costs, direct data recording and availability, adaptable for different user needs, faster test duration, etc.) [27]. In terms of NCS training, flexible online delivery of NCS courses is experiencing rapid growth [13]. However, there is limited research conducted on the impact that NCS online training solutions have on employable adults' lifelong learning and whether these solutions meet/address their motivations/life goals [16], [28]. By analysing the current landscape of the skills recognition and their relation within education, research and labour market needs, article [17] visualises the disconnection between the skills education and the labour market demands, which signals the danger of delineation between demand and supply of NCS.

3 Methodology

Technology mediated solutions for lifelong learning are complex due to the heterogeneity of the target users in terms of their education levels, learning capabilities, and self-regulation skills. It requires employing nonlinear processes to design technology mediated learning solutions [29]. It also requires adding a human-centered perspective to tailor the solutions according to the or beneficiaries desires. Therefore, an explorative research strategy is employed in this study to systematically capture learners' perceptions of how and in which ways NCS learning is anticipated. The idea was to comprehend how the learners perceive the NCS' learning. The basis of this article was an empirical study conducted in Sweden with a non-profit organisation, which supports the educated but unemployed or underemployed immigrant groups to increase their employability and hence duly integrate into the society. The target group is employable citizens who are willing to increase their chances for better employment and behaviour in the society via enhancing their NCS. A purposive sampling methodology was instrumented in identifying the data subjects among the employable citizens.

3.1 Capturing of user perceptions

Exploratory methods allow the human subjects to experience situations or solutions and provide feedback. In this study, the perceptions of the users on technology mediated solutions for assessing and enhancing their NCS are captured via structured questionnaires during a brainstorming workshop, followed by 1-1 interviews of a selected sample from the questionnaire respondents, as described subsequently.

A brainstorming workshop was organised, where the participants were first given the opportunity to explore the concept of NCS, NCS learning environments and their conceptual design. Instruments supporting visual thinking and stimuli for the respondents to brainstorm and to provide meaningful suggestions for solutions, were provided. The paper-based user journey exercise shown in Figure 1 was one of the brainstorming activities provided to the respondents. The purpose of such exercise was to discover if users intuitively grasp concepts, as well as the users' logic and expectations of the con-

ceptual design of the system. The stimuli showed five system functions, subject to prioritisation by the participants: Assessment, ePortfolio, Training courses, Job search and Dashboard. The participants then prioritised the functions based on the criterion of preference in achieving their personal motivations/goals.

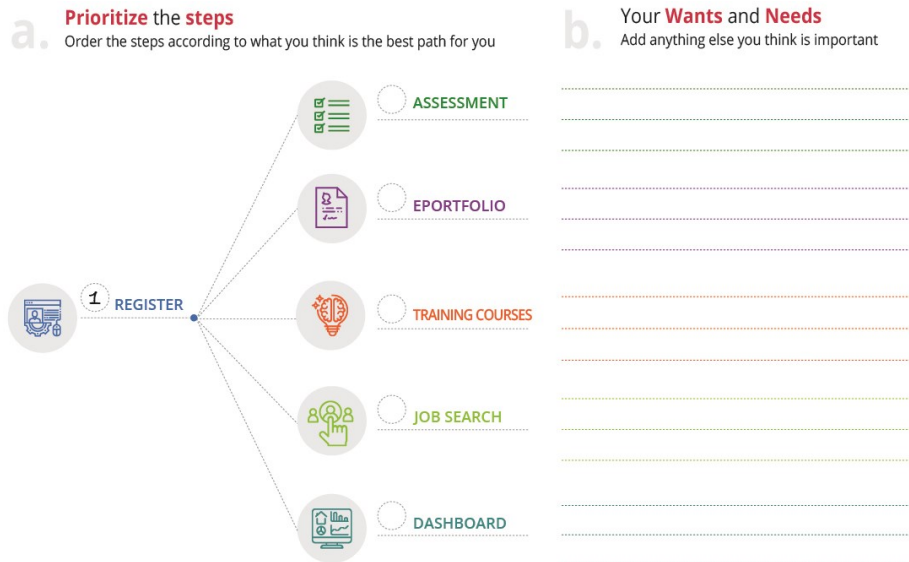


Fig. 1. Example of a stimuli used for capturing the priorities in NCS enhancement

The questionnaire was answered by those who participated in the brainstorming workshop. The content of the questionnaire was designed to capture the respondents' perceptions about the need and motivation of learning and assessing NCS, the challenges hindering their learning, and the mitigation actions they foresee in enhancing their NCS levels. Finally, their anticipated journey in doing so is captured via a question as shown in Figure 1.

A randomly selected subset of the respondents was selected for the follow-up interview. The purpose of the interview was to understand the reasoning behind their prioritisation for certain needs, and the requirements they recognised as critical to succeed in learning and assessing NCS. The respondents' reasoning in creating their own user journey, and their motivations to assess and improve their NCS were extracted through the interviews.

3.2 Design of the survey questionnaire and the interview guide

The backbone of the technical solution design is the user's desires in assessing and learning the NCS. Therefore, capturing the user perception was crucial, and hence the questionnaire consisted of structured questions in Likert scale of 5. A few open-ended questions were also included to capture other options than listed under the respective questions. The underlying concepts of the DeLone & McLean Information Systems

Success Model [30] were followed in designing the questionnaire. This IS success model allows capturing users' perceptions on systems and functions (information) quality that paves the ground to focus on users' thoughts in a wider perspective, although the users are not testing an already developed system. The questionnaire consisted of questions on their 1) demographic information 2) knowledge and awareness of the importance of NCS for increased employability 3) knowledge and the usability of technology 4) life goals and desires of improving NCS. Intention hereby was to understand how individuals recognise their need, challenges and motivations for improving NCS, and to identify their perceived individual roadmap to learning NCS.

The interviews were following a similar line since the aim of the interview was to gain a deeper understanding of the points raised in the questionnaire. Therefore, the interview guide also was following a similar structure to the questionnaire, but the respondents were allowed to provide more elaborated answers to the questions. Interviews were about 30 min long and were semi structured, to allow the participants to not deviate from the main focus while responding to questions. During the interviews the volunteers were asked to talk about their motivations for participating in the exercise for improving NCS, in relation to their life goals and the challenges or frustrations they face in achieving their goals. The personal interviews allowed us to get closer to the targeted potential user of a system for enhancing NCS and understand how their needs can be addressed.

3.3 Data analysis

Descriptive methods were used to analyse the questionnaire questions. A content analysis approach was followed in analysing the interview data. For analysing the interview data, the tool MAXQDA [31] and its functions to label, categorise, quantify and visualise responses were used. Codes and weights were added to the interviewers' statements during the analysis.

3.4 Ethical implications of the study

Since the data subjects in this study consisted of participants from marginalised groups, i.e., non-employed immigrants, their consent in participation was obtained prior to data collection. The data were anonymised prior to analysis to remove any identification information of the users and to prevent any ethical implications and biases in interpreting the results.

4 Results

4.1 Analysis of the questionnaire responses

The responses to the questionnaire were collected in a workshop setting, in order to support and provide equal opportunities in the environment where the explorative learning occurs. Analysis was made in three main categories; respondents' demographics

and background, questions with respect to the participants’ awareness and the willingness to improve NCS, as well as a user journey the participants envisioned via a technology mediated solution. Since the questions contextualised the participants’ current understanding and knowledge of the NCS and simultaneously extracted information on their willingness to improve their education in NCS in terms of better career opportunities, the reliability of the responses is significantly important to provide a meaningful outcome. This has been tested using Cronbach’s alpha [32] measure. Accordingly, the internal consistency of the responses to likert scale questions was 0.768, which justifies the reliability of the responses.

There were 80 responses in total, where 55 of them were females, 24 males and 1 preferred not to state their gender. Overall, most of the respondents were well educated, with 44 holding a bachelor’s degree, and 31 Masters as illustrated in Figure 2. Two with doctorates and another two with vocational qualifications, leaving only one with a Secondary educational qualification. However, 49 of the group were unemployed at the time of the study. 15 were employed full time, and there were also 9 students, 3 part timers, and 2 from the category “other”.

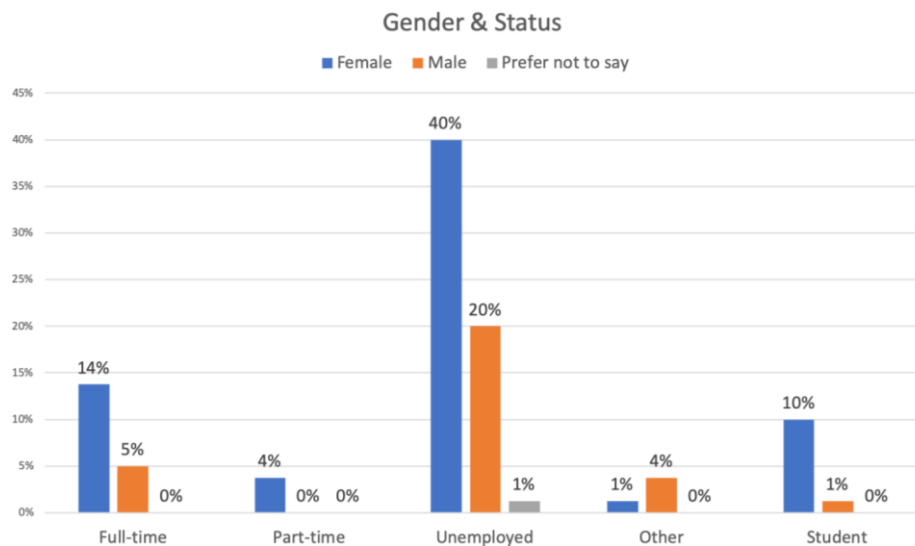


Fig. 2. The distribution of the respondents

Majority of the respondents were in the young age group, i.e., 25-35, while 25 participants were coming from the age group 36-45. Seven were over 46 and one respondent was younger than 25. Accordingly, the majority of the participants were young, unemployed and at the risk of exclusion.

Overall, the respondents were aware about the concept of NCS, where 59 out of the 80 respondents defined NCS correctly, and 18 out of them viewed NCS as soft skills. Majority referred to communication skills, as well as leadership and teamwork when they talked about NCS, and correctly identified the NCS among the other skills. For

e.g., 65, 70 and 55 respondents have identified the skills about Data management, Typing and MS Office tools respectively as skills not belonging to NCS. However, there was no correlation [33] with correctly identifying NCS and Gender, Education level of the respondents, or their employment status. The chi square test [34] for finding dependencies between the variables returned values >0.05 for all the above-mentioned variable pairs. Hence, there was no knowledge difference on NCS among the groups considered in Fig. 2.

Perceived importance of NCS. In this segment of questions, it was anticipated to capture the users' desires in improving their NCS and how they envisioned the need of NCS in their career enhancement or increasing job opportunities. Figure 3 represents the participants' ratings on the awareness of the importance of NCS within the community, as well as in the context of career and social development and. It shows that respondents are aware about the NCS importance in career and social contexts. In the question 'Do you think NC skills are commonly recognised as a valuable asset in your community?' The majority of the respondents thought it is very important (27) and Fairly important (29), as shown in Fig.3. The respondents also perceived that the NCS helps increase the possibility of integration in the society (40+35+12), and for career development (44+34+9)

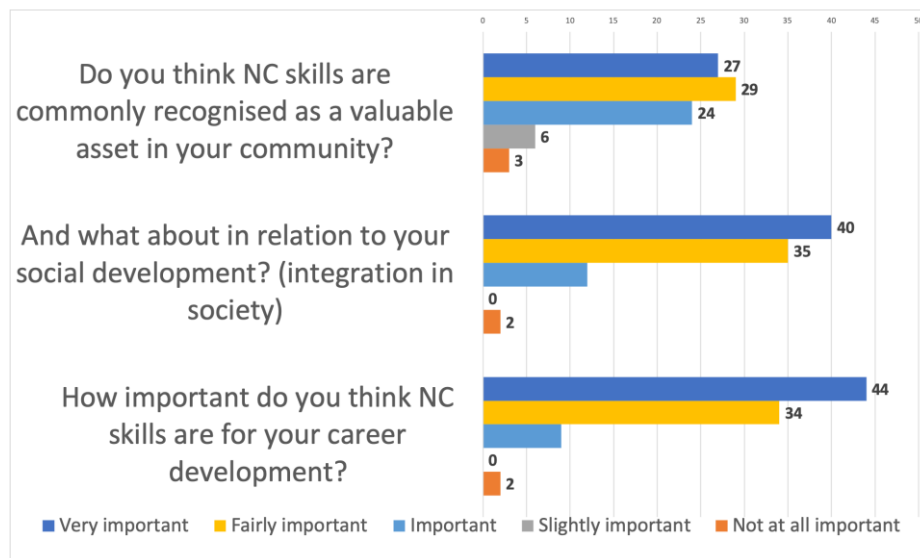


Fig. 3. Participants' ratings on the awareness of the importance of NCS in the context of social and career development

How the participants have thought about the importance of evaluation of their NCS is illustrated in Figure 4. As discussed in the background section and proven with the result of Fig. 3, although the participants are aware of the importance of NCS for their career development, more than half of the respondents have not been assessed by their

employers for the level of their NCS, and have not received any type of training for enhancing their NCS.

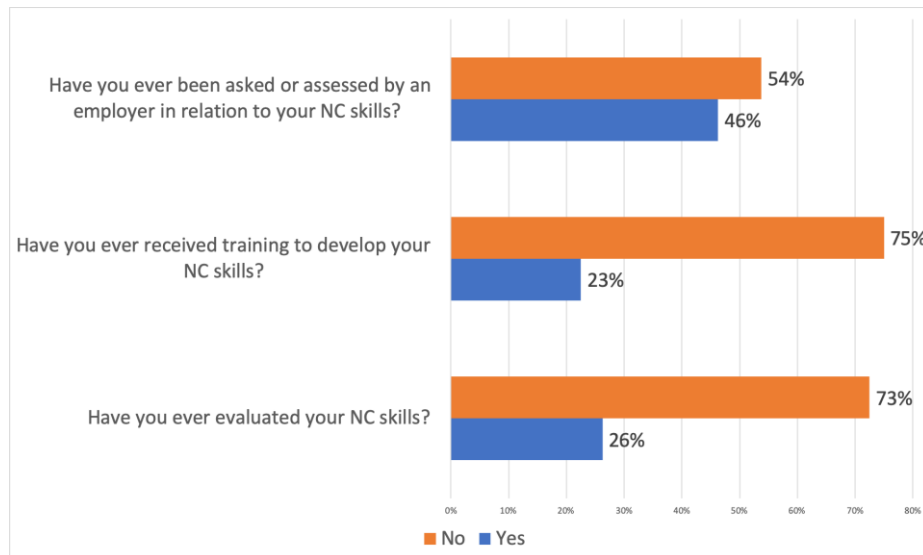


Fig. 4. Users previous experiences on NCS

The current landscape of NCS also demands similarities between the answers of the questions in Fig 3 and Fig 4 since it reflects the respondents' perception of importance of NCS vs. the actual experience of each individual obtained on NCS. A correlation analysis [33] was conducted in order to capture aforesaid similarities. This analysis returned that the following combinatory statements are significant, 1) the respondents find NCS are important in both labour market and integration in the society (0.77) 2) Respondents' belief that the NCS are important is correlated with the community recognising the value of it (0.59) 3) The respondents' perception on the fact that training of NCS should be in online form is associated with their general preference of online learning (0.71), while there is no relation between the societal recognition of NCS and the completion of NCS training or evaluation of the individual. 4) There is a very strong association of respondents having previous learning experiences of NCS and having been asked to assess their NCS (0.97), which in fact is an obvious result, since understanding how important the NCS with respect to enhancing employability is the motivation to learn NCS.

Furthermore, it was examined if there was any relation between the responses in Figure 3 and Figure 4 with gender, age, employment status, and education level. The chi-square tests returned no dependencies (at $\alpha=0.05$) of these categories with the participants' recognition of NCS and experience. Therefore, irrespective of the gender, age, education level or employment status, the majority of respondents recognised the importance of NCS.

Perceived challenges in enhancing NCS. Raising to a higher rank and job status is a primary goal of every employee, as is increasing employability for those unemployed. However, both these targets require considerable effort intrinsically (motivation and self-regulation) and extrinsically (support for upskilling). The subjects of this study found migration to another country and thereby not speaking the official language for prospective employment as the biggest challenge. This has been followed also by the facts; lack of experience (28), lack of job opportunities (24), lack of skills (22), and lack of training opportunities (12). Only five respondents thought they were affected by family commitments. To mitigate the challenges, the highest vote was for online learning solutions (41). External support to linking to a good network that supports obtaining jobs, and community support were the other options they pointed out. [*It would be great if I could participate in a short course/ visiting day about how my industry is here in Stockholm, how the working environment is, which skills are required*] according to one respondent. Another respondent expressed the importance of [*build (ing) a strong network to be able to be recommended to open positions*], while another response urged [*Help to improve our skills...*].

The results showed that the respondents have not had many opportunities to increase their NCS in their past, although they already realised the importance of enhancing NCS. In summary of the analysis of the responses, it was also evident that having an online solution that is easily accessible for learning and assessing NCS is what the respondents envision, and motivated to engage with. Furthermore, the outcome of the Spearman's correlation showed that these challenges and mitigation actions the respondents envisioned are equally distributed among the demographics; age, gender, education and employment status.

Respondents' perceived learning journey of NCS. The milestones of the journey to enhancing the NCS were presented to the respondents as described in Fig. 1, namely, Assessment, ePortfolio, Training Courses, Job Search, and Dashboard. The responses consisted of the sequence of the milestones each individual respondent perceived. For e.g. a respondent ranks Assessment as Step 1, if he or she wants Assessment as the first activity in the learning journey, while somebody else will rank it the least by assigning it to Step 5. Accordingly, these user journey ranks were summarised into frequency histogram charts as shown in Figure 5.

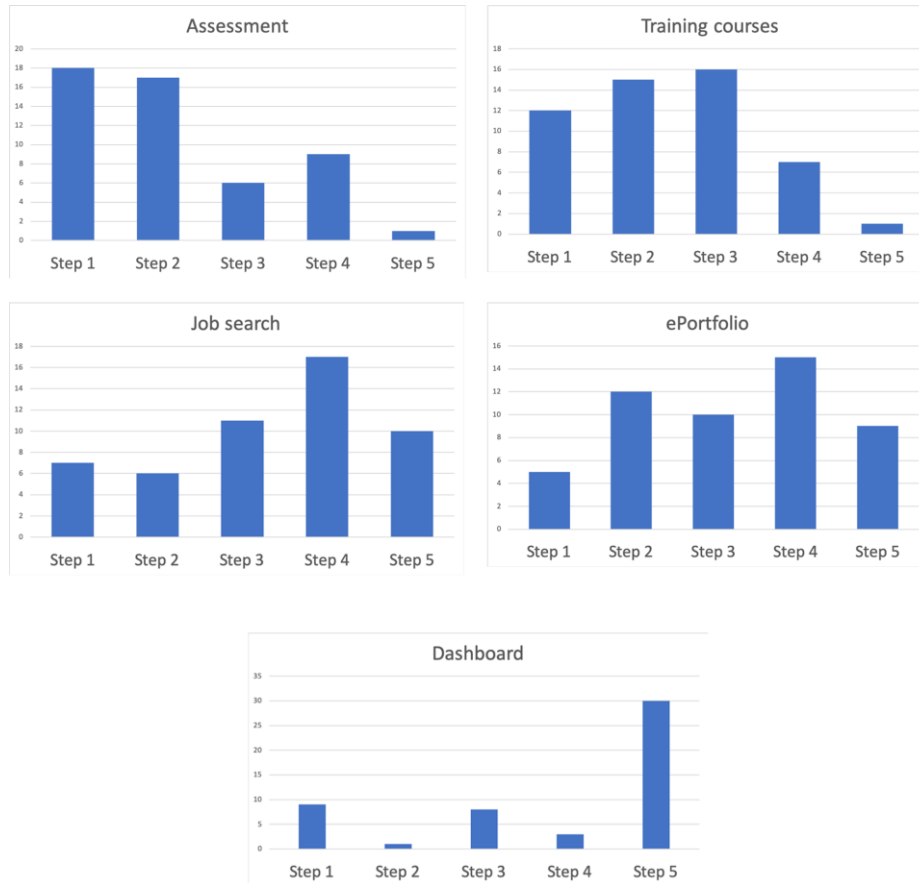


Fig. 5. Respondents prioritization of NCS Assessment (top left), Training courses (top right), Job search (middle left) and, ePortfolio (middle right), and Dashboard (bottom)

According to the histograms in Figure 5, basically, Assessment and Training courses have its median voting around Step 2 while ePortfolio, Job Search and Dashboard have medians at Step 3, 4 and 5 consecutively. The results of calculations of the central tendency [35] for all the histograms, Assessment is more favourable towards high priority with a left skewed curve in the histogram, followed by a lesser skewed curve in Training courses, with second priority. Job search has been more right skewed, tending to lower priority. ePortfolio priority is equally distributed between all of the levels of the user journey steps but slightly raised as a Step 2 and Step 4. Therefore, the shown interest in the Assessment reveals an engaged attitude to actively assess NCS and learn from it. The mindset towards NCS awareness/development is further accentuated by the participants' eagerness to commit to NCS training courses. Generalising the outcome, participants prioritise understanding their NCS and developing these, prior to seeking employment and enriching their ePortfolio.

4.2 Outcome of the analysis of interview data

To dive deeper in the aforementioned user centred design approach, six females and six males among the participants were interviewed. The interview volunteers brainstormed around the reasons for their interest in enhancing their NCS and how such motivations relate to their life goals, as well as both their social and employment related challenges and frustrations. Contextualising the outcomes on the basis of the Volunteer functions inventory components the following points were able to be identified.

Interviews' results as per the issue of motivations for engagement with participating in NCS development activities. The motivation for the majority of the participants was to get a stable career and to grow as professionals in the field they had studied or previously worked. Other participants stated that they would like to raise their income, have proof of knowledge of their NCS, get more training, or learn how to better use their NCS in different social and professional contexts. Lack of qualifications matching was also reported. According to interviewees [*I would like to grow in order to help others to grow*] or [*I would like to help others to integrate*]. The need for personal growth and development was acknowledged [*I would like to grow and fulfill my ambitions*]. Specific needs for upskilling aiming at increased employability was expressed in many interviews; [*I would like a good career and a good position*], or [*I would like to get my dream job*], or [*I would like to have a certificate/proof that I am a visionary and that I am creative*] are few such examples. The motivation for the need of new learning experiences and the opportunity to practice new knowledge, skills and abilities was further expressed in the interviews, for e.g. [*I would like to learn more about NCS and improve my leadership skills*]. Further elaboration on goals were also along the line of integration in the society, which were of utmost importance for all participants. In terms of frustrations, participants referred to negative feelings of lack of appreciation and lack of confidence related to professional barriers; a key step towards integration in a society. The feeling of “missing out” on opportunities was also apparent: [*I feel I am missing out on opportunities in Bangladesh. I feel I had a better life there.*]. Learning a new language and culture, as well as navigating a different job market were among common challenges for participants. The strong need for filling the current gap in knowledge and skills was repeatedly expressed: [*I need to get up to speed with the Swedish system and meet the requirements in my field.*] or [*If this NCS project can solve the gap in the professional career and show success stories, it would be great!*].

4.3 Interviews' results as per the anticipated learning journey

The personal interviews user journeys were analysed using frequency histogram charts in Figure 6. The histograms of both questionnaire and interview responses are presented against each other to visualise the similarities. Following a similar analysis as the user journeys of questionnaire responses, which milestone has the central tendency towards which option has been analysed. As it can be seen from the histogram and the central tendency values, it follows the same sequence as that of the questionnaire responses histogram.



Fig. 6. Comparison of user journey outcomes in both the survey methods

Therefore, it could be concluded, from the outcomes of both questionnaire and interview analysis, that a typical user who intends to use technology mediated solutions for enhancing their NCS may choose with a high tendency the user journey of NCS assessment, training, ePortfolio of NCS and job search based on the improved NCS. Furthermore, when designing a system to support such user centric solutions, the above-mentioned path for the user journey could be optimized in the levels of system and functional design.

5 Discussion

The outcome of this empirical work supported increasing the awareness of the desires of an employable adult related to NCS. The respondents of the survey recognised that NCS are integral to the development of their careers, as well as their social integration. Being skillful allows attracting social recognition according to the majority of the survey participants. Interestingly, the respondents also spotted that despite how important NCS are, and how NCS influence the performance quality of employees, there is no significant attention for NCS among the employers as per the status today. This outcome can very well relate to the European Commission's initiatives for empowering the citizens with NCS, a vital aspect for increasing the quality and the effectiveness of the job market dynamics in the digital age [6]. The gap between the demand for solutions and ways forward for learning and assessing NCS, and the opportunities available has become significant, as exploited in the outcomes of this research. This fact has been pointed out in some other studies such as [8]. The need for innovative solutions that support users to learn and assess their skills, in different alternative ways is thereby emphasised.

The respondents' ideal roadmap to improving NCS is approximately optimized by the analysis of the survey results. Although the results can hardly be generalised to a higher level due to the heterogeneity of the users having many differences in demands, education and employment levels, and demographic deviations, and so forth, the user journey analysis provides strong and similar tendency in both questionnaire and interview study outcomes towards a sequence of assessment, learning, presentation (ePortfolio) and job search. It is an interesting fact that users perceive the need for learning NCS prior to seeking the level of employability. It is also important to highlight that the life goals of individuals, their awareness and motivation to learn NCS and the challenges they foresee for enhancing NCS are independent of their age, gender, education level, or the nature of their employment. There is a perceptible feeling of personal involvement among the participants and a high degree of engagement in improving NCS. This result is further supported by the results in section 4.2, which show that NCS improvement also relates to a personal issue for the individual (lack of confidence, social integration, language barriers, cultural differences, career setbacks, etc.). The result of the participants' greatest expectation from the technology solution is to see their NCS ranking, as well as the continuous preference in the "Assessment" function; divulges the participants' engaged attitude in actively assessing their NCS. The priority in self-assessing NCS shows a strong intent to be informed and aware of the individuals' own NCS.

6 Concluding remarks

The gap between the demand and supply of NCS has been approached by many related studies and European initiatives due to the importance it carries in enhancing employability. This study, conducted as a part of a project named SkillsMatch, under the European Union's DG CONNECT, Unit G2 - Interactive Technologies, Digital for

Culture and Education, aimed at understanding the users' perceptions of NCS as a promising possibility for increasing employability of adults. The main purpose of this research work was to understand the challenges and find possible ways forward in succeeding technology mediated lifelong learning solutions to improve NCS that are user centric. As a result of this research, a user's preferred learning journey that a typical user would envision, as well as motivation drivers for users to use such solutions, have come to light. Thereby it is shown that the employable users anticipate in assessing their NCS first, followed by suitable training opportunities to improve NCS, creating and maintaining an ePortfolio of their NCS, finding job opportunities that comply to their enhanced NCS, and, lastly to summarise every activity in the technology platform for NCS enhancing into a dashboard. Therefore, prospective technology solutions could optimise this learning journey pathway for increased efficiency and effectiveness of a service provided by such a platform.

7 Acknowledgment

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