

GES APP – SUPPORTING GLOBAL EMPLOYABILITY SKILLS FROM THE PERSPECTIVES OF STUDENTS, STAFF AND EMPLOYERS

Sobah Abbas Petersen¹, Maria Iqbal¹

¹*Dept. of Computer Science, Norwegian University of Science and Technology, Norway*
Email: sap@ntnu.no

Alan Williams², Gavin Baxter²

²*School of Computing, Engineering and Physical Sciences, University of the West of Scotland, UK*
Email: {Gavin.Baxter, Alan.Williams}@uws.ac.uk

ABSTRACT

Global Employability Skills are skills that students acquire during their study period, that are in addition to their academic knowledge and skills, and that would help in their careers. As students continue their university journeys, they often overlook or underestimate the importance of developing Global Employability Skills that employers may consider important for their jobs. In this paper, we present a mobile application, the GES App, designed to help students recognize, document, and articulate their skills to their prospective employees. The GES App is designed to stimulate university students to reflect upon their experiences and assess the skills they may develop outside of their formal university studies. This paper presents how such an app could support students plan their careers and develop their Global Employability Skills that would make them more attractive to their future employers. A use case scenario is described to illustrate the role the GES App could play, from the perspectives of students, staff, and employers.

KEYWORDS: Global Employability Skills, Self-assessment, Career planning.

1. INTRODUCTION

Global Employability skills (GESs) are defined in the literature as skills that are graduate level abilities that are beyond the content of specific disciplines and also practical and transferrable (Maciejewski et al., 2020), which are needed by an individual to perform a task and would make them employable. The significance of global employability skills for employment is inevitable. The focus of students' attention seems to be discipline specific knowledge and academic performance and they usually fail to anticipate the importance of GES in addition to their discipline specific skills during their academic journey. Literature highlights student's proactive behavior towards career planning and preparing for their futures, e.g. (Clements & C., 2018). However, the challenge for making a connection between the GES acquired by students and what they learn at university and elsewhere during their university journeys still remain. Furthermore, finding the right candidates for fulfilling a company's requirements is not an easy task for employers and they find it hard to spot the right candidate at job fairs or through job applications.

This paper describes the work conducted as a part of the European ERASMUS+ project on GES, with four European universities from Greece, Norway, Poland and the United Kingdom (UK). The main aim of the project is to develop a mobile application to allow students to plan, record and evidence the acquisition and development of GES throughout their university journey. The project started in 2019 and lasted 3 years. The GES mobile app, hereafter referred to as the GES App or the app, aims to support the GES from the perspective of students, academic staff and employers. The perspectives of the three types of users and/or stakeholders have been obtained during the requirement analysis phase of the project where interviews were conducted to investigate their interests and needs for supporting the enhancement and documentation of GES among university students. The requirement analysis highlighted the need for a mobile application by users as the efficacy and ability to provide timely access to learning in authentic working contexts (Herrington et al., 2014). The activities supported by the GES App are designed in the light of requirements defined by the

three user groups, supported by the Self-Determined Learning Model of Instructions (SDLMI) (Shogren et al., 2019). This model is student or learner-centered and focuses on the learner's competencies and their capabilities and the capacity to learn and enhance their skills.

The aim of this paper is to show the effectiveness of supporting the enhancement and documentation of GES for students, from the three different perspectives that play significant roles for employability of students in the industry. The main research question we wish to answer is: how can we design a mobile application to support students enhance their understanding of employability skills? To answer this research question, we developed a prototype mobile application and conducted evaluations. In this paper we describe the main functionalities of the GES App and how students may use it in career planning and enhancing their employability skills.

The rest of the paper is structured as follows: Section 2 provides the theoretical foundations for the design of the app's concepts; Section 3 describes the methodology for obtaining requirements and the development of the GES App; Section 4 provides an overview of the requirements from different perspectives; Section 5 provides an overview of the GES App; Section 6 describes a use case scenario and the main functionalities of the GES App, and Section 7 concludes the paper.

2. THEORETICAL FOUNDATIONS

Studies have shown that employment requirements from the perspective of employers vary from that of employees, especially when the employees are students or fresh graduates. It can often result in complaints from employers with regards to workplace skills, work readiness and application of skills in non-academic environments (Jackling & De Lange, 2009). Therefore, to seek employment, students not only need to acquire a wide range of skills but also need to evidence the acquired skills as the significance of generic skills surpasses the need of discipline specific skills (Tomlinson, 2008).

A detail literature review conducted in the ERASMUS+ GES project revealed two important aspects that form the basis of the GES App design. First, employability cannot be guaranteed by skills, attitude, or knowledge individually and it is required to be a combination of the three to achieve the goal. Secondly, application of these skills in a workplace and practical life is more important than only possessing the skills that exhibits the competency required. Thus, the GES App is designed around the skills and knowledge of the user, but also provides resources to evidence and evaluate skills giving a way for users to show their competency.

The Self Determined Learning Model of Instructions (SDLMI) is a learner-centered learning approach, which focuses on the development of competency and the capability of a learner while building the capacity of learning (Shogren et al., 2019). The SDLMI approach has founded the basis of identifying activities of the GES App that allows a user to identify skills with self-determination while enabling them to explore the prospects to learn and practice those skills. The activity to add a skill enables a user to know what they have learned, while the activity of a Dream job enables a user to determine what is needed to be learned, giving the user an opportunity to learn and practice through the activity of practicing skills (Abbas et al., 2022).

Awareness can have a stimulating effect on the self-determined behavior of the student for which the process of reflection has been integrated. The model proposed by Rolfe et al. has been used as the foundation of the reflection process (Rolfe et al., 2001). Rolfe's model of reflection is also known as a reflective cycle and based on simple key questions of What? Now What? And So, What? These guidance questions are tailored as per the objectives of reflection and goal. The self-assessment of skills through a process of reflection is based on these guiding questions, which leads to the awareness and encourages learning.

3. METHODOLOGY

For the development of the GES App, the Design Thinking methodology was used, which not only offers benefits of a user-centered methodology, but is also recursive in nature (Plattner et al., 2015). The five phases of the Design Thinking methodology are empathize, define, ideate, prototype and test and the output of one phase is input to the subsequent phase. An interactive Figma prototype was developed to support the ideation

process, which is described in (Iqbal, Fredheim, et al., 2022). The work presented in this paper is focused on the empathize phase where requirements from the users and the stakeholders of the app were gathered, which contributed to the resulting prototype of the GES App.

Requirements were gathered from the four European partners from Greece, Norway, Poland, and UK. Requirements gathering was conducted in two stages; the first was a qualitative study and focus group and semi-structure interviews with the different stakeholder groups: students, employers and academic staff. The second stage was a quantitative study using questionnaires, which was based on the results from the qualitative study. A total of 75 participated in the first stage: 43 students and 19 staff participated in the focus group interviews, and 13 individual employers were interviewed. In the second stage, 153 students responded to a questionnaire. The same questionnaires and interview guides were used for the participants from all the countries and the requirements gathering activities were conducted in the same time period. The results were then analysed for the different countries and user groups to identify the functionalities for the GES App. The focus group discussions and interviews were conducted online due to the COVID-19 related restrictions and the questionnaires were administered using an online survey tool. Greek and Polish translations were used for the respective participants. Based on the requirements, a conceptual framework for the functionalities of the GES App and the activities it should support were defined (Iqbal, Fredheim, et al., 2022).

During the define and ideation phases, user scenarios were described, one of which is used in this paper to describe the functionalities of the GES App prototype, developed using the Unity platform.

4. REQUIREMENTS FROM DIFFERENT STAKEHOLDERS

The relevance of career aspirations and its psychological impacts have been discussed in the literature (Hoff et al., 2021). Studies have also shown that students have proactive career behaviors, such as career planning, skills development, career consultation, network building and show stronger commitment to their career goals, which have a statistically significant relationship with career success (Clements & C., 2018; Moeller et al., 2012). The qualitative analysis of the requirements gathered through interviews and focus group interviews in the EU ERASMUS+ project GES App identified three main groups of stakeholders and their different perspectives. Hence, the mobile application for GES App incorporates three types of users' perspectives through various functionalities, as shown in Figure 1.

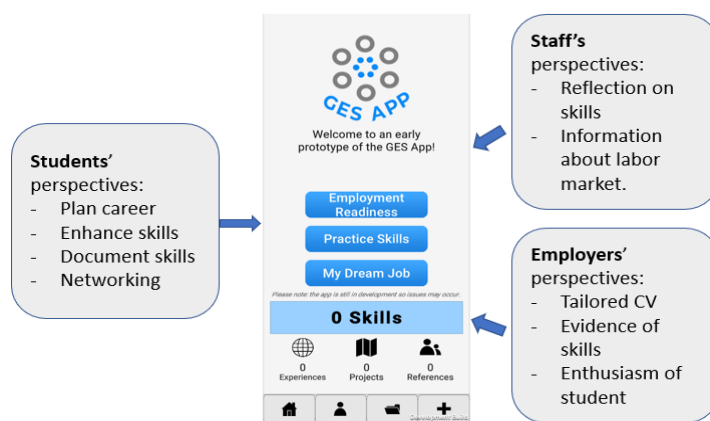


Figure 1 Different perspectives of Global Employability Skills

From the interviews with focus groups of students, it was established that students usually have a specific professional plan, although, they may also consider a plan-B as an alternative career path. Responses from students offer insights regarding their perspective of employability skills and the lack of specific skill-oriented training. It was also observed during the interviews that students acknowledge the fact that mere discipline specific knowledge does not suffice the requirement of employability in the industry and most employers seek extensive skill sets along with the need of experience. Students also identified the need for a mobile application, which could serve as an effective resource and indicate the need of tracking skills

development, skill documentation in an authorized way, the need for networking, advice on how to acquire more skills, training for interviews, industry specific skill phrase bank, the possibility to set goals and to track what they know.

The interviews with employers identified some of the important qualities they look in a potential employee which are, apart from the industry specific skills, the ability to learn new things, bring value to the company, a tailored CV and if they are able to keep their enthusiasm of working. The analysis of requirements enabled to envision some important functionalities of the mobile app that could enhance the prospects of employment for students, such as enabling them to present their skills with evidence of the skills, e.g., through experiences.

The perspectives of the academic staff, such as teachers and careers advisers, highlighted the need to support students to prepare for their employment and careers. This group of interviewees mentioned the use of a mobile app for enhancing the learning effects through reflections, modification of curriculum in the light of results acquired, and as an information channel for labor market skills.

5. OVERVIEW OF THE GES APP

The different perspectives highlighted through the requirement analysis identified the major activities that should be supported by the GES App. Thus, the functionalities in the GES App are based on five main activities, that support the development of students' GES. These activities are based on the literature and the key concepts, and the requirements that are summarised in Section 4. The main activities that have been identified to support the different perspectives, mainly the students, are summarised below:

1. Self-reporting, documenting and self-assessing GES: users are able to add one or more Skills to their skill profile, assess their Skills level, set a Goal and relate the Skills to their Goal, reflect upon how and what experiences have helped them acquire the Skills and document the evidence of the Skills by adding Experiences, Artifacts and References (Iqbal, Fredheim, et al., 2022).
2. Dream job: users are able to define a Dream Job and relate to the desired list and level of Skills for the Dream Job (Iqbal, Abbas, et al., 2022).
3. Practice selected skills: users are able to access learning resources that can help them to enhance their Skill set by learning a new Skill(s) or by enhancing the level of an existing Skill, e.g., by playing a game.
4. Networking and Ethics: users are able to connect to other users and share their experiences and communicate through the GES App.
5. Employment readiness: users are able to generate content for their CVs through the GES App, by accessing the Skills, Experiences, Artifacts and References from the GES App, practice for employment related activities such as learn about creating a CV and prepare for an interview.

6. USING THE GES APP

This section illustrates how the GES App supports a use case scenario, which includes three different stakeholders: student, employer and careers advisor. Using ideas from user-centered design, we have created a persona for a student. Sarah is a student, who is focused on getting an interesting job after completing her university studies and she is actively looking for job opportunities and preparing her CV and job applications. She is concerned about creating a good CV that will make her attractive to her potential employers and she is keen to find good ways to present her skills and experiences to potential employers. Thus, Sarah decides to get an appointment with the university's careers adviser, Joe. She was told by the Careers Adviser that she should carefully consider the skills and experiences she lists in her CV, and they should be tailored to the job position, to have maximum effect.

Sarah uses the GES App regularly and records all her skills in the app. She sets a goal using the Dream Job functionality and explores the diverse career paths that are possible with her set of skills. She discovers a selection of learning resources in the GES App, in the form of games, videos, YouTube and other online sources. Sarah browses through her skills stored in the GES App and wonders if she could use some of that information as a part of her CV. Sarah explores the GES App to see if this is possible and she finds the

functionality to create a CV. She selects the relevant Skills and the related Experiences, References and Artifacts that she would like to include in her CV and exports them as an editable file. She receives the exported list of Skills as an email message. She copies the contents into her CV template, edits the format and adapts her CV to the needs of the job. Sarah found this to be an effective means of tailoring her CV.

Sarah attends a jobs fair at the university and comes across a company that she would like to apply for a job and meets Helen, the head of Human Resources (HR). Sarah accesses her skills profile overview in the GES App and asks Helen about the possibilities of getting a job in her company. Sarah happily explains her experiences, the skills that she has acquired and how those skills could be relevant for a job in the company. Sarah feels that she has a better idea of the skills that she needs to focus on. Sarah leaves the stand very motivated and excited, and very glad that she had been using the GES App.

The following sub-sections describe how the GES App functionalities support the main activities identified through this user scenario.

6.1 Documenting skills and evidence of skill

To document the skills, the student selects the option of “Add Skill”, which provides the possibility to select a skill from a skills repository in the app, as shown in Figure 2 (a), or add a new skill, as shown in Figure 2 (b). The student is asked if she wants to share the added skill as shown in Figure 2 (c) and if option of sharing is selected by the student, the skill is added to crowdsourced skills repository in the GES App. Once the skill is added to the student’s profile, the app enables the student to assess the skill through reflecting upon her level of the skill and she can define her level as novice, advanced beginner, competent, proficient, and expert, as shown in Figure 2 (d). A summary of the skill can be viewed in the profile as shown in Figure 2 (e), where the skill is listed with skill level.

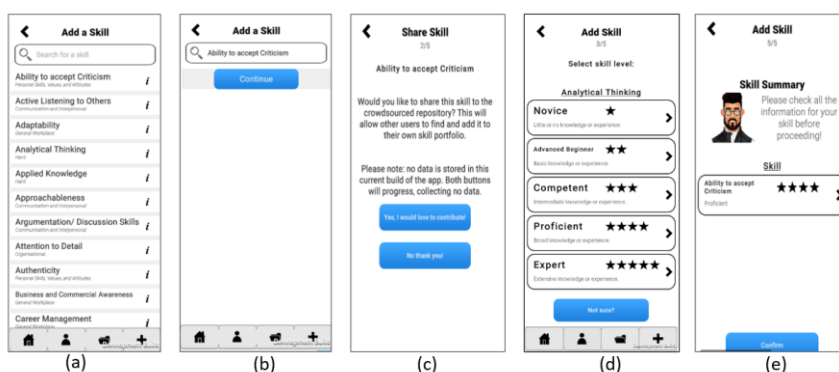


Figure 2 Documentation and self-assessment of Skills in the GES App

Students also need a convincing way to show that they actually have the skill that they have included in the GES App. The evidence for a skill can be recorded in the app in the form of Experiences, Artifacts and References. Recording the evidence to support the reported skill allows student to showcase the practical expertise that can be acquired during a project, a job or an internship as an experience, and an output from the experience in terms of videos, reports, paper, online links, etc. Furthermore, it can also be a human reference that could validate the skills of a student, such as a referee from academia or industry.

After adding a skill in the GES App, as shown in Figure 2, students can also add the evidence of a skill and can record experiences through the “Add Experience” functionality, as shown in Figure 3 (a). The GES App asks the student to add dates during which the experience was acquired, as shown in Figure 3 (b). Then, the student needs to identify the skills from the list of saved skills that are practiced or acquired through the recorded experience as shown in Figure 3 (c). The GES App also enables students to assess the experience through a series of questions in terms of very good, good, moderate, little, and not at all, as shown in Figure 3 (d). Once all the information is recorded, the student can view the summary of the added experience, which is shown in Figure 3 (e).

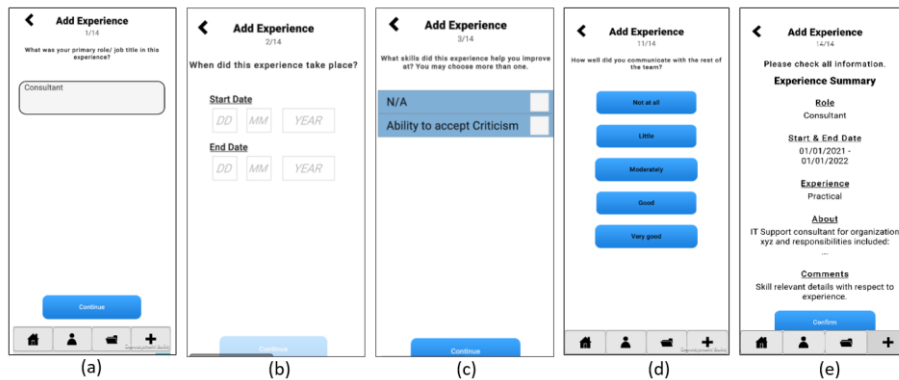


Figure 3 Documentation of evidence of a Skill as Experience in the GES App

Similarly, students can also record and upload artifacts through “Add Artifacts” option of the GES App, and add the relevant details for the added artifact, such as which skills were enhanced during the development of the artifact. The “Add Reference” option allows the student to add referees, similar to those that would be included in a CV, where the student can also add the contact details of a referee, if consent has been sought.

6.2 Creating a CV

Exploring further, students can also extract all the saved information regarding the skills in the form of an editable file. This is a functionality to support “Employment Readiness” as shown in Figure 4 (a), and the “Create CV” functionality, Figure 4 (b), which facilitates students to create tailored CVs for job applications. Students can select the relevant skills from the list of skills in their profile and the experiences, artifacts and references associated with the skills, as shown in Figure 4 (c). The app then displays a summary of skills and other information that have been selected, which could be exported as a text file. This provides an effective way of identifying the relevant skills and starting to create a CV. The contents from GES App could be imported/copied into the desired template for a CV.

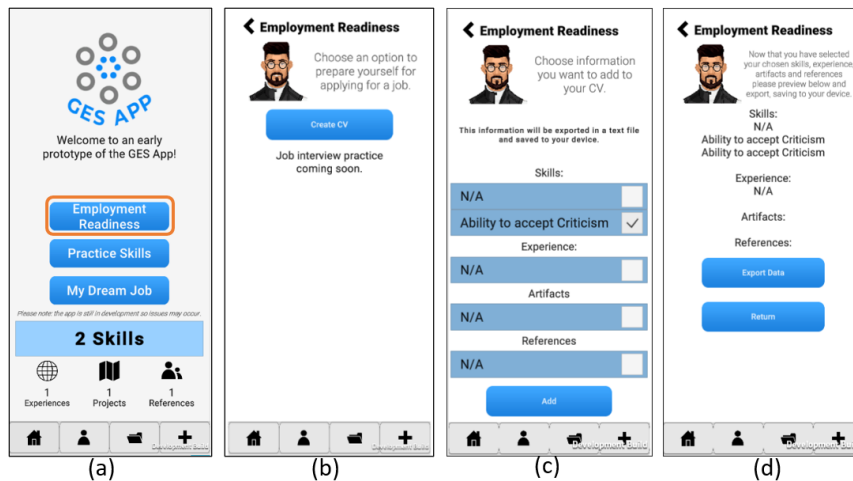


Figure 4: Creating a CV

6.3 Reviewing and presenting an overview of Skills

When a student meets the careers adviser or a potential employer, it is helpful to be able to present an overview of their skills. The GES App functionalities support the perspectives of staff and employers. Staff such as career advisers have a need to consider the skills and experiences of a student before giving advice regarding their future possibilities and to encourage students to use tailored CVs for the specific job opportunities. Similarly, an overview of a potential employee’s (e.g. a student’s) skills and experiences

would enable them to obtain an impression of the student. More importantly, how a student assesses her level of skills will, no doubt, help career advisers as well as employers to obtain a sense of the student's enthusiasm and advise them on how to further enhance their relevant skills. The overview of skills that is available in the GES App facilitates all three perspectives.

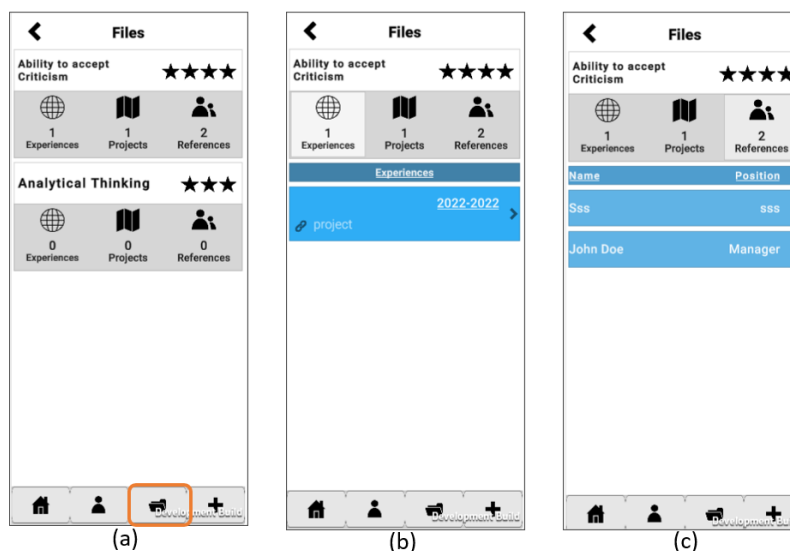


Figure 5: Overview of skills (skills profile of a user) in the GES App

An overview of a student's skills is summarized in the GES App as shown in Figure 5 (a). They are presented as a set of skill cards, where each card displays the details in terms of skill level, number of experiences during which a specific skill has been practiced, number of artifacts for which the skill has been applied and the number of references that validate the acquisition of the skill. Such details could support academic staff to provide personalized counselling services to students and can also guide them for improvement with respect to the student's career goals.

When a skill card is selected from the list, the GES App displays the detailed overview of that skill as shown in Figure 5 (b). The skill recorded by the student can be explored further for details of the evidence recorded, such as the details of experiences recorded, or details of references recorded to support the skill, as shown in Figure 5 (c).

7. CONCLUSION

In this paper, we have presented a mobile application, the GES App, designed to help students recognize, document, and articulate their skills to their prospective employees. The GES App was designed to stimulate university students to reflect upon their experiences and assess the skills they may develop outside of their formal university studies. The main research question for this study has been how we could design a mobile application to support students enhance their understanding of employability skills. To address this, a prototype of the GES App has been developed and some of the main activities supported by the app have been described in this paper. The GES App has been evaluated by students from Greece, Norway, Poland and the UK, where pre- and post-intervention questionnaires were used. The results are currently being analyzed. Preliminary results of the analysis show that the participants had positive comments about the idea of the app, the organization of contents in the app and the functionalities. They found the app meaningful, important, original and motivating towards exploring many aspects of their employability skills and attitudes. They felt that the app has a good level of game flow, usability and learnability and that the expected outcomes are important since the app could support students toward exploring and reflecting on their employability skills. Furthermore, the results also showed that the participants showed an increase in their understanding of the labour market and how to prepare for employment.

The current version of GES App is available in Google Play for Android devices. In the future, we aim to enhance the functionalities in the app to support students based on the feedback from the evaluations. One of the main limitations of this study is that the evaluations have so far been limited to students and the lack of feedback from the other stakeholders. Furthermore, an evaluation of the GES App from the perspective of the learning and enhancing skills need further investigations.

Our future work will focus on conducting further user evaluations with the different stakeholder groups such as academic staff and employers, in the different countries. In addition, we continue to analyze the results from the studies reported in this paper and the feedback from them will be used to improve the GES App capabilities and improve our evaluation methods.

ACKNOWLEDGEMENT

This work has been conducted as a part of the EU Global Employability skills App (GES-App) project, by a KA203 - ERASMUS + Strategic Partnerships for higher education, grant; KA2, Cooperation for Innovation and the Exchange of Good Practices; Grant Agreement no: 2019-1-UK01-KA203-062146. The authors would like to thank the participants of the interviews and surveys and all the GES App project participants for their contributions.

REFERENCES

- Abbas, A., Iqbal, M., Boyle, L., Baxter, G., Williams, A., Petersen, S. A., Topolewska-Siedzik, E., Jimoyiannis, A., Tsiotakis, P., & Scott, G. (2022). Graduate Employability Learning through Self-Determined Learning Model of Instruction (SDLMI) Driven Digital App INTED2022 Proceedings, <https://library.iated.org/view/ABBAS2022GRA>
- Clements, A. J., & C., K. (2018). Understanding students' motivation towards proactive career behaviours through goal-setting theory and the job demands-resources model. *Studies in Higher Education*, 43(12), 2279–2293.
- Herrington, J., Ostashevski, N., Reid, D., & Flintoff, K. (2014). Mobile technologies in teacher education: Preparing pre-service teachers and teacher educators for mobile learning. In J. Ryan et al. (Ed.), *Successful Teacher Education* (pp. 137-151). https://www.academia.edu/33938952/Mobile_Technologies_in_Teacher_Education
- Hoff, K., Van Egdome, D., Napolitano, C., Hanna, A., & Rounds, J. (2021). Dream Jobs and Employment Realities: How Adolescents' Career Aspirations Compare to Labor Demands and Automation Risks. *Journal of Career Assessment*, 30(1), 134-156. <https://doi.org/10.1177/10690727211026183>
- Iqbal, M., Abbas, A., & Peteren, S. A. (2022). Development of Graduate Employability Skills with Regards to Dream Job Using Mobile App International Conference on Education and New Learning Technologies-EDULEARN 22, <https://ges-app.com/index.php/publications/>
- Iqbal, M., Fredheim, L. J., Olstad, H. A., & Peteren, S. A. (2022). Graduate Employability Skills Development through Reflection and Self-assessment using a Mobile App, International Conference on Mobile Learning
- Jackling, B., & De Lange, P. (2009). Do accounting graduates' skills meet the expectations of employers? a matter of convergence or divergence. *Account. Educ.*, 18(4-5), 369–385.
- Maciejewski, G., Simpson, A., Boyle, L., Jimoyiannis, A., McCrory, M., Olstad, H. A., & Scott, G. (2020). A Literature Review Looking at Graduate Employability Skills (GESs): GES App Report 1: Review of the GES literature.
- Moeller, A. J., Theiler, J. M., & C., W. (2012). Goal Setting and Student Achievement: A Longitudinal Study. *Modern Language Journal*, 96(2), 153–169.
- Plattner, H., Meinel, C., & Leifer, L. (Eds.). (2015). *Design thinking research: Making design thinking foundational*. Springer.
- Rolfe, G., Freshwater, D., & Jasper, M. (2001). *Critical reflection for nursing and the helping professions: A user's guide*. Palgrave Macmillan.
- Shogren, K. A., Raley, S. K., & Burke, K. (2019). *The Self-Determined Learning Model of Instruction Teacher's Guide*. <https://selfdetermination.ku.edu/wp-content/uploads/2019/05/Teachers-Guide-2019-Updated-Logos.pdf>
- Tomlinson, M. (2008). The degree is not enough': students' perceptions of the role of higher education credentials for graduate work and employability. *British Journal of Sociology of Education*, 29(1), 49–61.