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Online Tools to Support Career Planning on the Pathway to Vocational Education and Training (VET) or General Education¹

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Abstract

Context: Career planning is crucial for young people transitioning from school to vocational education and training (VET) or general education. Self-reflection and career-related decision-making are essential for balancing societal, cultural, and personal factors. Career education in schools plays a vital role in preparing students for these transitions; however, challenges arise in providing personalised career support within the school environment. Digital tools offer a promising method to encourage career-related reflection and transformative learning, allowing students to explore their interests, competencies, and career pathways in a structured and self-directed manner.

Approach: This study investigates the implementation and impact of www.digibe.ch, an online career reflection tool. The tool offers structured reflection tasks covering various career-related themes, encouraging students to engage in self-reflection. Using a longitudinal study design, we collected data from students in lower secondary education over three years, monitoring their interaction with the tool, their self-reflection practices, and their career-related decision-making. We also examined the role of teachers in facilitating career guidance and their perspectives on integrating digital tools into career education.

Findings: The results indicate that career reflection is highly individualised, with students engaging in self-reflection at varying paces. Some students reported notable benefits from using the tool, gaining deeper insights into their career interests and aspirations. Others responded negatively to the reflection tasks, perceiving little relevance in exploring broader career perspectives. Teachers played a significant role in granting students access to the online tool, and

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their involvement and views on it varied. Some teachers recognised digital career reflection as an essential element of career education, whereas others regarded it as secondary to traditional career guidance methods. The study also highlighted that career planning is rarely linear; students frequently revisit and revise their choices, underscoring the necessity for flexible and adaptive career education models.

Conclusions: The findings emphasise the importance of fostering career-related self-reflection and transformative learning in school-based career education. Digital tools like www.digibe.ch can effectively support this process; however, their success depends on students' readiness to reflect and the teachers' role in facilitating career exploration. Career planning should be recognised as a dynamic and ongoing process, requiring career education and adaptable guidance instead of rigid, linear methods that aim to place students in a suitable follow-up solution. Future research should explore how to better integrate career education within school curricula and how digital tools can be optimised to meet diverse student needs.

Keywords

career-related self-reflection, transformative learning, career education in schools, digital career education tools, individualised career planning

1 Introduction

This paper reports on www.digibe.ch, a project designed to support young people in exploring careers and making decisions by encouraging career-related reflection and development. It aims to foster self-reflection and transformative learning related to careers (Mezirow, 2009). We present the structure of a longitudinal intervention study and results that address the roles of teachers, self-reflection, and transformative learning in students.

Learning to manage career planning and decision-making is crucial in students' educational journeys and school-to-work transitions and beyond. Young people must choose to pursue vocational or general education no later than the upper secondary level, and in some countries, even earlier at the lower secondary level. Transitioning from school to work is a beginning, not the final goal; career planning is a dynamic, long-term process that helps individuals adapt to changing career demands (Ertl, 2023).

In many countries, VET promises to offer young people sustainable careers and supply the economy with skilled workers. It is seen as a viable education pathway in many countries to higher education and work (Billett et al., 2018; Cedefop, 2014) or aiding them in becoming self-employed (Allais, 2022). Nevertheless, for many young people, the decision to pursue education and training in initial vocational education and training (iVET) and VET rather than general education at the upper secondary level is inconceivable. They often perceive VET as more physically challenging, fearing longer working hours or feeling they have less freedom to pursue their projects compared to academic education (Nägele & Düggele, 2020). These young individuals limit the range of career options they consider valid. Regardless of how we analyse it, career decisions are influenced and constrained by many early experiences and perceptions shaped by cultural, gender, and societal factors (Gottfredson, 2002).

Young people should engage in career-related reflection to address these issues and broaden their exploration and choices. This process involves expanding their perspective on work and career options while developing thoughtful and informed decisions. Young people encounter numerous challenges when navigating the complexities of dynamic societies and emerging forms of employment (Savickas & Savickas, 2019). We cannot expect all young individuals to be capable or willing to self-reflect (Hell & Pässler, 2022), nor is it necessary—or feasible—for all young people to have access to career counselling services and coaching.

Career education and counselling for students is often embedded in the school context. Teachers and parents play a crucial role in supporting students' career planning within a classroom, which presents various challenges. These challenges begin with the availability of resources and extend to how to manage individualised coaching and guidance in a classroom setting (Stalder et al., 2023). Teachers often find themselves acting as educators, counsellors, or career guides, assisting students in navigating educational transitions and transformations. Our online tool is primarily designed for career education and guidance activities in schools and by teachers. "Career education" may be a more appropriate term in this context than "career counselling" or "guidance." Career education fosters an understanding of the influences shaping concepts of self and career, emphasising the central role of schools and teachers in supporting young people's development (Irving, 2010).

Digital tools are essential in this context, as they can enhance career education and guidance. Questions emerge regarding how to design these online tools and their capacity to stimulate career-related reflection.

2 The Aims of Career Guidance

This paper emphasises a shift in perspective when examining the transition from school to vocational education and training (VET) through the lens of transformative learning and developmental processes. These processes help individuals design their careers and acquire the competencies necessary to handle challenges during their transition from school to VET, and later in their careers, guided by career-related reflections. This approach contrasts with viewing the transition through the lens of employability, which focuses on facilitating young people's entry into VET via matchmaking processes.

Many countries invest significantly in guiding young people into vocational education and training (VET), with teachers or career counsellors playing central roles (Stalder et al., 2023). In the transition from school to work, whether at the lower or upper secondary school level, career counselling often focuses on helping young people pursue education and employment. For a long time, it has been an important goal to encourage young people to enter post-compulsory education (Heinz et al., 1985).

Firstly, career guidance aims to assist adolescents in finding their way into education, training, and work. It prepares them academically for general education or makes them employable for apprenticeship positions. A broader approach to career education and counselling is rooted in career development theories (Savickas et al., 2009; Super, 1990). By doing so, we can guide young people toward suitable educational programmes or work opportunities, on one hand. This approach, however, narrows the focus to solving a transitional problem (Guichard, 2022).

Secondly, career guidance aims to educate young people on how they can independently design their careers. This broader focus seeks to empower individuals to shape their future (Guichard, 2022). Designing a career depends on an individual's ability to engage in self-discovery about the labour market, as well as an assessment of personal competencies, social contexts, and cultural backgrounds. During the critical phase when young people select educational or education-to-work pathways, it is essential to view this as an opportunity for decision-making and for learning to navigate career paths, considering the developmental trajectories, competencies, personal interests, and socio-cultural contexts that influence their aspirations (Bårdsdatter Bakke & Hooley, 2022).

Career guidance and education are embedded in complex school, family, and societal contexts that limit the range of options in designing a career. Students lacking adequate career guidance may feel discouraged from pursuing vocational education and training (VET), even if it aligns with their talents and ambitions. Career planning among young people requires support from parents, teachers, training institutions, or career counsellors (Stalder et al., 2023; Von Wyl et al., 2018). Without this support, they tend to make career decisions heavily influenced by

their social background or their family's socio-economic status (Hirschi, 2009). Career support should aim not only at finding immediate solutions but also at helping students develop reflection and decision-making skills. In the Swiss context, many cantons have emphasised the importance of empowering students to shape their careers (Nägele & Schneitter, 2016). This also addresses the challenges of increasingly non-linear career paths, which are visible in the transitions across secondary and tertiary education in Switzerland—for example, in students dropping out and later re-enrolling in VET programmes, general education, or higher education (Deppierraz, 2021; Laganà & Babel, 2018). Such discontinuities in education and training, along with career changes, pose significant challenges not only for individuals but also for organisations and society as a whole.

2.1 Reflection and Career Orientation

Reflection becomes a fundamental component of career planning, but it is not a self-running process (Hell, 2009). Personality and motivation are developed through reflection. By reflecting on oneself and making one's thoughts, experiences, and actions the focus of that reflection, a person can undergo significant change (Silvia, 2021). Many career orientation programmes rightly encourage young people to reflect. However, it is essential to distinguish between reflection that aims to identify follow-up solutions during the transition from school to work and reflection that genuinely addresses beliefs to broaden or change one's perspective on a career.

The functional reflection emphasises becoming aware of the competencies and knowledge necessary to identify suitable follow-up education or employment. This reasoning is usually reflected in theories that connect vocational personalities with work characteristics (Holland, 1996). It can be tempting to evaluate one's situation to discover appropriate career options. While it is crucial for students to feel assured that their chosen path aligns with their goals at the start of any apprenticeship program (Nägele & Neuenschwander, 2014), career orientation and decisions should also consider the rationale behind those choices and the potential for growth.

In doing so, self-reflection becomes pertinent. Grounded in transformative learning theory (Mezirow, 2009), self-reflection is central to embarking on a transformative learning and developmental process. Within this framework, one can evaluate gender stereotypes, cultural norms influencing career planning, and parental expectations directed at children. This is crucial, as career decisions made at a young age, not only in Switzerland, are often swayed by gender or cultural factors. Self-reflection and insight are vital competencies for fostering life-long career management skills, equipping students to navigate the complexities of contemporary career paths. Given the increasing unpredictability of labour markets, promoting reflective capacity in career education is essential for enhancing students' adaptability and informed decision-making.

While mastering the transition from school to work is crucial, understanding the reasons behind specific decisions and their potential outcomes is even more essential. Career guidance in schools should foster reflective and critical thinking, practical skills, and improve career education alongside the ability to design a career path.

3 Support Career Planning by Online Tools

Various offline and online tools exist to assist in vocational orientation and decision-making for young people. Most of these tools are developed from practice to practice, though some are also grounded in research, especially in higher education (Höft et al., 2024). Many tools rely on “paper and pencil” methods. Teachers use these tools individually with their classes or

integrate them into whole-school strategies. One example of a whole-school strategy is the Potenzialanalyse, implemented in some German Bundesländer. This initiative aims to identify and assess an individual's strengths, interests, and competencies to help them make informed decisions about their career path (Dahmen & Thielen, 2024).

We focus on scientifically validated tools that teachers and individuals can quickly adopt. There are three types of tools: Type one tools match people to jobs or study programmes. An example is www.was-studiere-ich.ch, which aims to help individuals make informed decisions about what to study at university. Type two tools are rooted in the serious gaming tradition and engage young people in activities within games. An example is www.like2be.ch, which addresses gender stereotypes in vocational orientation and choices (Keller et al., 2023). A third type includes tools that aim to induce career-related self-reflection based on self-assessment concepts related to competencies, interests, mindsets, and environments that influence career exploration and decisions. Examples include www.informationssetting-bl.ch and www.digibe.ch.

3.1 www.digibe.ch

www.digibe.ch is a collection of tasks designed to stimulate career-related self-reflection, serving as a foundation for development and transformative learning processes (Nägele et al., 2025). The reflection tasks that students are engaging with are organised by topics: “Planning”, “Family and Peers”, “Vocational Interests”, “Decisions”, “Future”, “World of Work”, “Networks”, “Supporting Others”, and “Career Planning as a Game”. For each topic, multiple tasks are available to students.

One task in the category “Vocational Interests” is about freely expressed vocational interests, which are often measured through standardised interest inventories with stimuli like “Load and unload freight materials”, “Learn about human behaviour”, or “Perform office work” (Chernyshenko et al., 2019). In www.digibe.ch, young people are encouraged to develop up to six vocational interests in their own words, which can be quite demanding. This encourages individuals to explore and articulate their interests. Students mention interests like, for example, “Working in a team, ” “being able to balance work and leisure time, ” or “communication. ”

Another reflection task in the “Vocational Interests” category asks students to assess their vocational interests based on two publicly available online interest tests. The first test from² covers nine vocational fields, such as Nature, Nutrition, and Hospitality. The second test is a picture assessment from³, depicting twenty-two vocational fields (Zihlmann, 2023). Students taking both tests will notice that the results differ, as categorising vocational interests into nine versus twenty-two fields can lead to distinct outcomes. After completing these two interest tests, the young people are asked to report the results of each test within www.digibe.ch and compare them. The aim is to reflect on these differences, potentially retake one of the tests, and compare the new results with the previous ones. The students then receive feedback on their written reflections, prompting them to consider what they have experienced and learnt during the reflection task, whether it has changed their mindset, and if they wish to discuss their insights further with peers, teachers, or parents.

In the category “World of Work”, young people are asked to design their own vocation; in the category “Future, ” they write a letter to themselves at ages 30 and 90. The essential point

² BIZ = Berufsinformationszentrum Zürich, Career Information Center Zurich.

³ SDBB = Schweizerisches Dienstleistungszentrum Berufsbildung | Berufs-, Studien- und Laufbahnberatung, Swiss Competence Center for Vocational Education and Training | Career, Study, and Guidance Counseling

is that none of the reflection tasks aim to identify a specific follow-up option. Even in the category “Decision”, the tasks focus on decision processes and styles, exploring how individuals typically decide - whether cognitively or intuitively.

All reflection tasks follow a consistent structure: an introduction, task work, feedback on the results, and reflections on those results. After completing a task, students receive a summary of their answers and reflections for their ongoing career planning.

3.2 www.digibe.ch in Action

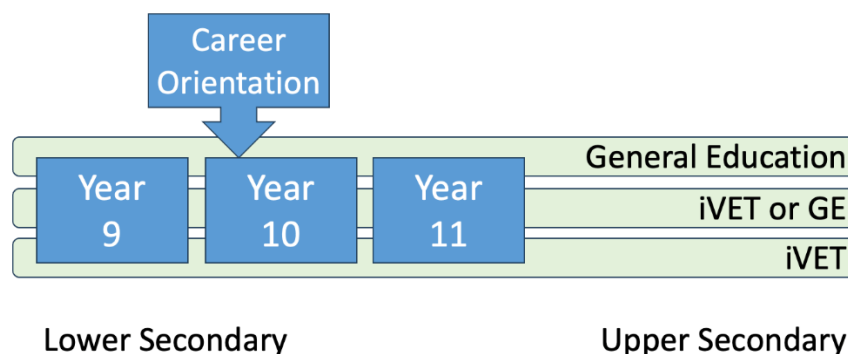
The implementation of www.digibe.ch in the context of career orientation activities in Switzerland is described briefly. Career orientation (Berufsorientierung) is a central topic at the lower secondary level, as every student must decide how to continue their education after compulsory school upon completing Year 11 or when they reach the age of 16; there is no school leaving examination or diploma in Switzerland. Theoretically, young people might not need to pursue upper-secondary education. In practice, up to 95% complete education and training at the upper-secondary level. It is difficult for individuals without a certifying diploma at the upper-secondary level to find a job. Approximately 60% of young people are enrolled in company-based training programs in dual VET. Across the EU, 49% of upper-secondary students participate in VET programs, although access to workplace training remains limited in many EU states (Directorate-General for Education, Youth, Sport and Culture, 2022).

Consulting the Lehrplan 21 (D-EDK, 2016), the model curriculum for all cantons with German-speaking students, vocational orientation aims to develop career-related competencies in four areas: “personality profile”, “educational pathways and the world of work”, “decision-making and handling difficulties”, and “planning, implementation, and documentation”. Vocational orientation spans all three years of lower secondary education, from Year 9 to Year 11, for students aged 13 to 16. It is described as a highly individualised process in which the teacher takes on the role of a coach. Schools and teachers are responsible for initiating this process, while students and parents are tasked with finding a follow-up solution. This is important because students cannot decide to start apprenticeship training since they are under 16 and cannot sign a working contract themselves. In practice, we find that teachers often feel responsible for securing a follow-up solution for all of their students. No teacher wants to see students disengaged from education after lower secondary school. Additionally, there is significant pressure from cantons on schools and their leaders to ensure that all students are in a certifying follow-up solution (EDK et al., 2015). This concern stems from research findings indicating that the absence of a diploma at the upper secondary level leads to precarious career paths and low incomes. It also relates to an inter-cantonal agreement that mandates no student should leave upper secondary education without a certifying diploma.

How vocational orientation works in practice varies between the cantons and schools. However, a common implicit rule is that students with good grades are exempt from career orientation since they plan to continue their education. Another implicit rule suggests that women tend to pursue education and training in the health sector, while men lean towards technical fields. At least, the data indicates that students often make their decisions accordingly.

In practice, career orientation often does not span all three years at the lower secondary level but takes place in the first semester of Year 10, when students are aged 14 to 15. In many cantons, students are grouped into different performance levels. Those in demanding school levels with good marks are often exempt from vocational orientation, as they remain in school and continue in general education. Students at school levels with “basic demands” may only apply for apprenticeship training at the upper secondary level. Only students in school levels between the low and high ranges have a real choice, as they can orient themselves towards general education or demanding apprenticeship training (initial vocational education and training). See Figure 1.

Figure 1
Career Orientation in Swiss-German Cantons



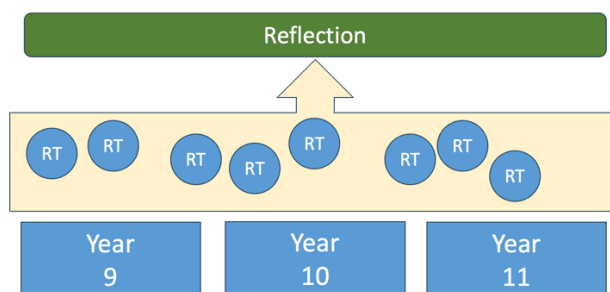
Note. iVET = initial Vocational Education and Training, GE = general education.

In practice, we find many tools for vocational orientation that focus on what we call a “functional reflection”. This emphasis is even stronger in some cantons, as they automatically suggest suitable apprenticeship training programmes to students based on their school marks and interests. The emphasis is on making young people employable and fitting, which appears efficient at first glance.

However, these initiatives do not give young people enough time to reflect on and develop their career plans, especially during a phase marked by various physical and mental changes. There is no other subject in school where skills must be quickly developed and decisions must be made so swiftly.

Before this background – the need for individualisation and the limited time available – we present www.digibe.ch as a collection of adaptive tasks. It is illogical for a student to reflect on vocational interests while actively applying for an apprenticeship; this reflection should occur beforehand. It’s more beneficial for students to consider the influence of parents and peers on career planning when the topic is relevant to them. As a result, there is no fixed order or frequency for engaging with a specific reflection task, as shown in Figure 2. The only guideline teachers provide is that students must undertake a reflection task. However, this approach conflicts with the structured lesson planning in vocational orientation, which often adheres to the recommendations of cantonal career counselling services that advocate for a linear progression, where all students simultaneously participate in the same activities.

Figure 2
Timing of the www.digibe.ch intervention



Note. RT = reflection task.

In addition to the reflection tasks mentioned above, www.digibe.ch includes a module to monitor the career planning process. With just a few questions, students report on the status of

their career planning and any follow-up solutions up to three times per semester, totalling 18 reports over three years at the upper secondary level.

4 Data and Results

4.1 Data Collection

Progress in career orientation was assessed up to three times per semester, resulting in eighteen observations from 2021 to 2024, covering school years 9 to 11. Over two years, student participation decreased from 2,848 to 702; by the end of the third year, 150 students remained. All parents of participating students provided informed consent.

4.2 Reception

The decline in participation was primarily due to students making decisions regarding their follow-up plans in year 10, along with other factors such as leaving school, changing classes, staff alterations, and teachers withdrawing from the project. Interestingly, some students paused their project participation but returned after some time. During their pause, they indicated that they had completed their career planning and identified an apprenticeship they wished to pursue. A few months later, they returned, informing us they were still seeking a follow-up solution. This illustrates that career planning is not linear but involves loops and 'repetitions' or refinements along the journey.

www.digibe.ch elicits very different reactions from students. Some students reported that working on the reflection tasks was one of the best experiences they had in career orientation. However, we also observe students reacting quite harshly and negatively when asked to self-reflect on fundamental questions in career planning. They see no sense in doing so. Similarly, we received feedback from some teachers, who even withdrew their classes from the project because they did not see a valid reason to promote self-reflection among their students. We believe that one factor explaining this situation is that schools often have very little time for vocational orientation. In Year 9 and Year 11, there are often no dedicated vocational orientation lessons and only one weekly lesson in Year 10.

4.3 Outcomes

Teachers. As teachers are responsible for guiding vocational orientation, they instruct students to use the online tool www.digibe.ch. The research project's goal was to grant teachers as much freedom as possible in implementing the tool in their teaching. Teachers fulfil many roles, such as instructor, facilitator, guide, coach, or coordinator, which need further clarification (Stalder et al., 2023). Their roles evolve as students grow older and teachers gain more experience.

Games that students play. A reflection task focuses on video games and the competencies developed through them. We discover that students can recognise career-related skills in their games and understand how to transfer these skills to the real world of career planning (Hoffelner et al., 2025).

Interests. A reflection task focused on vocational interests allowed students to express themselves freely. We observe that the interests they mentioned fall into categories from standardised interest tests, while also introducing new categories such as "nature/environment", "computer", or "communication" (Hänni et al., under review).

Self-reflection and transformative learning. If students are ready to engage in career planning, participating in reflection tasks enhances self-reflection (Nägele et al., submitted; Nägele & Wyss, 2024). In summary, the intervention(s) are effective. However, it makes little sense to require students who are not prepared to plan their future education and training to reflect on

career issues. This finding is highly relevant for teachers, as it indicates that in career guidance, there is no one-size-fits-all approach; it is a highly individualised process.

Many students encounter frustrations in their career orientation process stemming from work experience days (Schnupperlehre), discussions with others, applications for apprenticeship positions or general education schools, and informational events or tests (Nägele et al., 2022). These frustrations provoke self-reflection and ultimately lead to transformative learning.

Overall, we observe the positive effects of working on reflection tasks at www.digibe.ch in enhancing career-related self-reflection. Additionally, we note that career planning is a highly individualised process that progresses at different paces for each student in a class and, for many students, can be pretty complex. This underscores the need for research to describe non-linear processes and for practical efforts to develop concepts for career orientation that facilitate personalised career support.

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