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FutureLab+ and OrientationLab: An Integrated Digital Pathway for Educational and Career Guidance

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Abstract: School-based career guidance can support students' self-awareness and exploration of future educational and occupational pathways. This exploratory study investigated the potential of FutureLab+–OrientationLab, a digital career orientation pathway integrating experiential activities, vocational interest assessment, self-assessment, and interactive reflection. The study involved 28 students from the I.S.I.S.S. "Osvaldo Conti" in Aversa, Italy, assigned to an experimental group and a control group. Across two consecutive phases, students completed technology-enhanced or conventional orientation activities and evaluated their experiences using five-point Likert-type questionnaires and open-ended questions. Descriptive findings indicated that the experimental activities generally received higher mean ratings than the corresponding conventional activities for knowledge of personal interests and characteristics, reflection on future possibilities, interest and involvement, and overall satisfaction. FutureLab+ received its highest relative rating for interest and involvement, whereas OrientationLab received higher ratings for perceived self-knowledge, usefulness, and overall satisfaction. However, conventional activities received higher ratings for clarity and comprehension in both phases. Qualitative responses highlighted personal interests, abilities, concrete experiences, and future possibilities. Further research involving larger and more diverse student populations, including students with special educational needs, is needed to examine the pathway's applicability, accessibility, and potential contribution to inclusive career guidance.

Keywords: Educational and career guidance; Experiential assessment; Student engagement

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1. Introduction

School-based career guidance plays a central role in supporting students' educational and career development as they navigate educational choices and prepare for future transitions. In contemporary educational contexts, career guidance extends beyond providing information about educational and occupational opportunities to encompass processes that promote self-awareness, broaden students' understanding of possible pathways, and strengthen their capacity to make informed decisions and manage the uncertainties associated with future transitions (Magee et al., 2025).

This broader perspective is particularly relevant during adolescence, a developmental period in which young people begin to form expectations and

representations of their future and make decisions concerning their educational and career trajectories. In this context, career adaptability represents an important resource, as it reflects students' capacity to anticipate and prepare for future possibilities, make decisions, explore alternatives, and cope with changes and challenges in career development (Parola et al., 2025).

Recent research with secondary school students indicates that career adaptability is associated with social, emotional, and behavioral competencies, suggesting that students' capacity to navigate future educational and career transitions is shaped not only by academic factors but also by broader personal and socio-emotional resources (Nuutinen et al., 2026; Pellegrino et al., 2025).

This perspective is reflected in the Italian policy framework for school-based guidance. The *Guidelines for Orientation*, introduced by Ministerial Decree No. 328 of December 22, 2022, frame orientation as an ongoing educational process intended to support students in developing self-awareness, recognizing their competencies and potential, and making increasingly informed choices throughout their educational pathways (Ministero dell'Istruzione e del Merito [MIM], 2022).

From a pedagogical perspective, school-based orientation can be understood as a developmental process through which students reflect on their experiences, develop a clearer understanding of their competencies and possibilities, and gradually build the knowledge needed to make educational and career choices. This perspective places students' experiences, competencies, and reflections at the center of the orientation process and conceptualizes educational and career choice as an ongoing process rather than as a single decision made at the transition between educational levels (De Vries et al., 2024; Häggblom et al., 2025).

A central challenge for career guidance is determining how best to assess and interpret the resources students draw upon when exploring educational and career possibilities. Traditional assessment practices have largely relied on self-report measures of vocational interests, preferences, perceptions, and expectations. Although these measures provide valuable information about students' self-perceptions and anticipated futures, they may not fully capture how students engage with concrete experiences, interpret feedback, or reflect on possible courses of action. Recent research on career interventions with young people indicates that structured educational experiences can support the development of career decision-making and career adaptability, while pointing to the value of approaches that engage students in active learning rather than relying solely on self-reported information (Wang et al.,2024). Active and student-centred pedagogical approaches can play an important role in career guidance by engaging students in practical activities that promote reflection, self-awareness, and confidence in career decision-making (Cai et al., 2026).

Against this background, FutureLab+–OrientationLab was developed within the broader AUTSET project, designed and implemented by Cesfol. The pathway integrates two complementary components, FutureLab+ and OrientationLab, into a digital career guidance programme for schools that combines assessment, experiential activities, and guided reflection (Mirra et al., 2026).

The present study explores the potential contribution of FutureLab+ and OrientationLab to school-based career guidance, considering both the contribution of each component individually and their integration within a structured orientation pathway. By comparing students' evaluations of the technology-enhanced activities

with those of corresponding conventional activities, the study examines six dimensions: knowledge of personal interests and characteristics, reflection on future possibilities, perceived usefulness, interest and involvement, clarity and comprehension, and overall satisfaction. The analysis of students' questionnaire responses, including open-ended comments, provides preliminary insights into the perceived value of each component and of the integrated pathway, while the exploratory design and small sample do not allow definitive conclusions about their effectiveness.

2. Materials and Methods

The study was conducted during the 2025–2026 academic year at I.S.I.S.S. "Osvaldo Conti", in Aversa, Caserta, Italy. A total of 28 students participated in the study and were randomly assigned at the individual level to an experimental group (n = 15) or a control group (n = 13). Both groups completed the activities within the same school context and under comparable organizational conditions.

The study adopted an exploratory comparative design comprising two consecutive phases of school-based career guidance. The experimental group participated in a digital orientation pathway comprising FutureLab+ and OrientationLab, whereas the control group completed conventional orientation activities addressing related objectives across the two phases.

The experimental group participated in a digital orientation pathway comprising FutureLab+ and OrientationLab, whereas the control group completed conventional orientation activities corresponding to the two phases of the experimental intervention. During the first phase, students in the experimental group used FutureLab+, a digital career-guidance platform comprising four experiential missions and a vocational interest assessment inspired by Holland's RIASEC model. Information derived from students' responses and interactions with the activities was used to provide individualized feedback.

During the same phase, students in the control group completed a vocational interest questionnaire inspired by Holland's RIASEC model, which took approximately 15 minutes to complete and included items addressing their interests in different activities and occupations, as well as their perceived clarity regarding future occupational prospects (ITACA Education, 2026a).

In the second phase, students in the experimental group engaged with OrientationLab through the iTeach environment, which included the ITECH conversational avatar. This component was designed to support the interpretation and further exploration of information generated during the first phase through interactions focused on students' interests, personal characteristics, and possible educational and occupational pathways.

The artificial intelligence component was designed to support interaction and reflection. It was not intended to assign occupational categories, generate diagnostic classifications, or make automated decisions concerning students' educational or career trajectories (ITACA Education, 2026).

In parallel, students in the control group completed a traditional career guidance questionnaire administered via Google Forms, which took approximately 15 minutes to complete and assessed self-awareness, perceived interests and abilities, individual competencies, prior educational experiences, post-graduation aspirations, awareness of educational and career pathways, and self-efficacy in making future

academic and career-related decisions (ITACA Education, 2026b). Although both the experimental and control activities focused on similar orientation objectives, they differed in their format, design, and level of student engagement. The experimental activities included hands-on tasks, personalized feedback, or interactive dialogue, while the control activities consisted of traditional questionnaires. Therefore, the comparison reflects students' perceptions of the activities as they were implemented in the school setting, rather than the effects of digital technology alone, since other differences between the activities may also have influenced their evaluations.

At the conclusion of each phase, all participants completed a structured evaluation questionnaire designed to assess their perceptions of and experiences with the activity in which they had participated. The first questionnaire was administered after FutureLab+ in the experimental group and after the vocational interest assessment in the control group (ITACA Education, 2026c). The second questionnaire was administered after OrientationLab/iTeach in the experimental group and after the conventional orientation questionnaire in the control group (ITACA Education, 2026d).

Both evaluation instruments were prepared and distributed via Google Forms. Each included five-point Likert-scale questions, with responses ranging from strong disagreement to strong agreement, as well as open-ended questions that allowed students to express their views in their own words. The questions focused on six aspects of the activities: students' understanding of their own interests and characteristics, their reflection on future possibilities, the perceived usefulness of the activities, their level of interest and participation, how clear and easy to understand they found the activities, and their overall satisfaction.

The quantitative analysis focused on descriptive comparisons of the mean scores reported for the experimental and control activities across the six evaluation dimensions. The results were used to identify patterns in students' evaluations and differences between the corresponding activities in the two phases. In view of the exploratory design and limited sample size, the findings were interpreted descriptively and were not presented as evidence of statistically established differences. Because the platform-generated indicators had not undergone prior psychometric validation, they were not treated as standardized psychological measures and were not used for diagnostic or predictive purposes.

Following an initial reading of the responses, categories were developed on the basis of recurring content and similarities in students' comments. The categorization focused on students' personal interests, perceived abilities, experiences with the orientation activities, and reflections on possible future educational and occupational pathways. The resulting categories were used to organize and summarize students' responses and to describe similarities and differences in their perceptions across the four orientation activities. The analysis was intended to provide a descriptive account of students' experiences rather than to develop a formal theoretical interpretation of the data.

All participants were 18 years of age or older and provided informed consent after receiving information about the study and the use of their data and data were handled in accordance with applicable data-protection and confidentiality requirements.

The study materials included the FutureLab+ and OrientationLab/iTeach platforms, the Google Forms questionnaires, and the study protocol. De-identified data and research materials are available upon reasonable request, subject to applicable data-protection and intellectual-property restrictions.

3. Results

This section presents the findings from the evaluation questionnaires administered at the end of the two career-guidance phases. Students' evaluations were examined across six dimensions: knowledge of personal interests and characteristics, reflection on future possibilities, perceived usefulness, interest and involvement, clarity and comprehension, and overall satisfaction. The results are presented separately for each phase, followed by a comparison of the experimental and control activities and a descriptive analysis of students' open-ended responses. Quantitative findings are reported as mean scores, while qualitative findings summarize the categories identified through the inductive categorization process.

3.1. Evaluation of the first orientation Phase

This subsection explores students' perceptions of the two activities implemented during the first orientation phase, namely FutureLab+ in the experimental condition and a vocational-interest questionnaire based on the RIASEC framework in the control condition

3.1.1. FutureLab+ and RIASEC-based questionnaire

- FutureLab+ – Knowledge of interests and personal characteristics: FutureLab+ received a mean score of 3.35, compared with 3.00 for the RIASEC-based questionnaire. This difference indicates a more positive student evaluation of FutureLab+ in relation to the recognition of personal interests and characteristics;
- Reflection on future possibilities: FutureLab+ received a mean score of 2.97, compared with 2.72 for the RIASEC-based questionnaire. This difference suggests a slightly more positive student evaluation of FutureLab+ in relation to reflection on possible future educational and occupational pathways;
- Perceived usefulness: The RIASEC-based questionnaire received a slightly higher mean score (3.33) than FutureLab+ (3.20);
- Interest and involvement: This dimension showed the largest difference in mean scores between the two activities. FutureLab+ received a mean score of 3.97, compared with 3.11 for the RIASEC-based questionnaire;
- Clarity and comprehension: The RIASEC-based questionnaire received a slightly higher mean score (3.92) than FutureLab+ (3.85);
- Overall satisfaction: FutureLab+ received a mean score of 3.65, compared with 3.50 for the RIASEC-based questionnaire, indicating a slightly more positive overall evaluation.

3.2. Evaluation of the second orientation phase

This subsection explores students' perceptions of the two activities implemented during the second orientation phase, namely OrientationLab, delivered through the iTeach environment and using the ITeach conversational avatar, in the

experimental condition and the traditional orientation questionnaire in the control condition.

3.2.1 OrientationLab/iTeach and traditional orientation questionnaire

- OrientationLab/iTeach – Knowledge of interests and personal characteristics: OrientationLab received a mean score of 3.88, compared with 2.00 for the traditional orientation questionnaire. This was the largest difference in mean scores observed across the six evaluation dimensions in the second phase;
- Reflection on future possibilities: OrientationLab received a mean score of 3.50, compared with 2.08 for the traditional orientation questionnaire, indicating a more positive student evaluation in relation to reflection on possible future educational and occupational pathways.
- Perceived usefulness: The mean score was 3.50 for OrientationLab and 2.00 for the traditional orientation questionnaire;
- Interest and involvement: OrientationLab received a mean score of 3.75, compared with 2.50 for the traditional orientation questionnaire;
- Clarity and comprehension: The traditional orientation questionnaire received a higher mean score of 4.63, compared with 3.69 for OrientationLab;
- Overall satisfaction: OrientationLab received a mean score of 3.94, compared with 3.50 for the traditional orientation questionnaire.

3.3. Comparison of the experimental and control pathways

This subsection compares the findings from the two orientation phases in order to identify common patterns between the experimental and control activities. The descriptive results indicate that the experimental activities received higher mean ratings than the corresponding conventional activities on most of the evaluation dimensions. However, conventional activities received higher ratings for clarity and comprehension in both phases.

- Knowledge of interests and personal characteristics: FutureLab+ received a higher mean score than the RIASEC-based questionnaire, while OrientationLab received a substantially higher score than the traditional orientation questionnaire;
- Reflection on future possibilities: Both experimental activities received higher mean ratings than their respective control activities;
- Perceived usefulness: The first phase showed a slightly higher rating for the RIASEC-based questionnaire, whereas OrientationLab received a higher rating than the traditional orientation questionnaire in the second phase;
- Interest and involvement: Both FutureLab+ and OrientationLab received higher mean ratings than their respective control activities, with the largest difference in the first phase;
- Clarity and comprehension: The control activities received higher ratings in both phases, although the difference was small in the first phase and considerably larger in the second;

- Overall satisfaction: FutureLab+ and OrientationLab both received higher mean ratings than their respective control activities.

Table 1 summarizes the mean scores obtained across the six evaluation dimensions for the four orientation activities.

Table 1. Mean scores across the six evaluation dimensions

Evaluation dimension	Experimental activities	Control activities
Knowledge of interests and personal characteristics	FutureLab+ 3.35; OrientationLab 3.88	RIASEC-based 3.00; Traditional 2.00
Reflection on future possibilities	FutureLab+ 2.97; OrientationLab 3.50	RIASEC-based 2.72; Traditional 2.08
Perceived usefulness	FutureLab+ 3.20; OrientationLab 3.50	RIASEC-based 3.33; Traditional 2.00
Interest and involvement	FutureLab+ 3.97; OrientationLab 3.75	RIASEC-based 3.11; Traditional 2.50
Clarity and comprehension	FutureLab+ 3.85; OrientationLab 3.69	RIASEC-based 3.92; Traditional 4.63
Overall satisfaction	FutureLab+ 3.65; OrientationLab 3.94	RIASEC-based 3.50; Traditional 3.50 [1]

[1] Values are mean scores based on valid responses.

3.4 Analysis of Open-Ended Responses

This subsection presents a descriptive analysis of students' open-ended responses to the four orientation activities, using an inductive approach to group recurring themes related to personal interests, perceived abilities, experiences with the activities, and reflections on future educational and career paths, in order to better understand how students perceived the activities and what they considered relevant to their future choices.

- FutureLab+: Students' responses highlighted personal interests, perceived abilities, and individual characteristics, with references to creative, social, organizational, and practical skills, as well as experiences such as field activities and journalistic tasks, which some students considered useful for reflecting on their future educational and career choices.
- RIASEC-Based Questionnaire: Students' responses mainly concerned the confirmation of existing interests and the clarity of the questionnaire, with several students reporting that the activity reinforced interests or ideas they had already considered, while others indicated that it had not helped them identify new interests; overall, the questionnaire was described as clear and easy to complete.
- OrientationLab/iTeach: The responses focused on practical experiences, the recognition of personal interests and abilities, and the exploration of future possibilities, with particular references to field activities and experiences involving children, as well as interests and skills identified through the activity and potential future paths in marketing, university studies, and employment, while some students reported that the activity confirmed ideas they had already developed.

- Traditional Orientation Questionnaire: students expressed different views on the questionnaire's usefulness for their orientation, with some reporting that it confirmed existing educational or career interests, such as management or teaching, while others found that it offered little new information or added limited value, particularly when they had already formed clear ideas about their future plans.

4. Discussion

The findings of this exploratory study provide preliminary insights into the contribution of the FutureLab+–OrientationLab pathway to school-based career guidance, both as an integrated intervention and through its individual components. Rather than allowing definitive conclusions about effectiveness, the results offer preliminary indications of how students perceived the combination of experiential activities, self-assessment, and reflection on their personal resources and future possibilities.

The pathway is designed as a progressive orientation process in which different activities are intended to support students' self-awareness and exploration of future educational and occupational opportunities in complementary ways. Further research is needed to examine the contribution of each component and to determine how their integration may support students' career-orientation processes.

A central element of the proposed innovation is the instructional design of FutureLab+–OrientationLab, which integrates experiential activities, feedback, self-assessment, and reflection into a structured learning pathway. Rather than simply digitizing conventional career-guidance instruments, the pathway combines activities designed to help students explore their interests and abilities, interpret their experiences, and reflect on possible educational and occupational choices.

Instructional design provides a framework for connecting the different activities and creating opportunities for students to reflect on their personal characteristics and possible future educational and occupational pathways (Mayer, 2005).

Within this framework, particular attention should be given to OrientationLab and its interactive avatar, ITeach. A conversational avatar may serve as a pedagogical mediator by helping students revisit information generated through previous activities and reflect on its relevance to their interests and possible future educational and occupational pathways.

From a pedagogical perspective, the avatar may facilitate interaction and reflection while maintaining students' active role in the career-guidance process (Di Tore et al., 2025).

The primary limitations of the present study are its small sample size and its recruitment from a single school, which limit the generalizability of the findings and preclude definitive conclusions regarding the effectiveness of the pathway.

Future research should extend the study to larger samples involving multiple classes and schools to examine the applicability of FutureLab+–OrientationLab across different educational contexts and investigate the contribution of its individual components to students' career-orientation processes. Longitudinal research designs would also be valuable for examining whether potential improvements in self-awareness and reflection on future possibilities are sustained over time.

A second direction for future research concerns adapting FutureLab+–OrientationLab to students with special educational needs, particularly students with disabilities and specific learning disorders. Previous research has highlighted the barriers students with disabilities may encounter when accessing career guidance services and the importance of providing support tailored to their needs (Caslin, 2025). Similarly, vocational preparation for students with learning disabilities requires appropriate resources, professional expertise, and adequate support within educational settings (Hoff et al., 2026). These considerations highlight the need to investigate whether and under what conditions the integration of experiential activities, self-assessment, and digital mediation can support more accessible and inclusive school-based career guidance.

5. Conclusions

The innovative contribution of FutureLab+–OrientationLab lies in its integrated design, which combines experiential activities, self-assessment, feedback, and interactive reflection within a unified digital pathway for school-based career orientation. By bringing these elements together, the model offers a structured approach to career exploration that encourages students to identify their interests, reflect on their strengths, and consider future educational and career opportunities, consistent with recent research on online orientation pathways and the development of transversal competencies (Da Re et al., 2024).

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