



Applying Digital Mind Mapping to Support Student Career Planning: The Coggle Approach at SMK GIKI 1 Surabaya

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Abstract: This community service program aimed to enhance students' ability to develop independent career plans by applying the mind mapping technique through the Coggle application. The program employed a coaching approach utilizing the IGROW model, which consists of five key components: Intention, Goal, Reality, Options, and Will/Way Forward. The participants of this training were students from SMK GIKI 1. To ensure a systematic and practical coaching process, the IGROW model was implemented throughout the sessions. The results showed that the training effectively equipped students with the ability to visualize and plan their careers systematically, including mapping their interests, further education goals, and required skills. Evaluation findings indicated a significant improvement in students' understanding of career planning, as evidenced by the difference between pre-test and post-test scores. Therefore, this training was proven effective in helping students prepare for their future careers in a more structured and potential-oriented manner.

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Introduction

SDGs goal number 8 is to promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (Kioupi & Voulvoulis, 2019). In the context of education, SDGs 8 can be achieved through student career map planning, which helps students choose career paths that offer decent and sustainable jobs. With proper career planning, students can select professions that support inclusive and sustainable economic growth (Nurhasanah et al., 2016). In addition, career-relevant education also helps develop the skills required in the workplace, thereby contributing to the creation of decent jobs for the younger generation (Liu & Jew, 2023).

One aspect that needs attention is the career planning of students at the Vocational High School level. In the field of education, students encounter challenges related to their chosen occupation, including a lack of knowledge about careers and difficulty selecting further education levels that align with diverse educational and economic backgrounds. Individuals between the ages of 12 and 17 enter the early adolescent phase, and students in this age range are considered to be in this phase (Hurlock, 2003). During this phase, changes occur in the socioemotional, cognitive, and psychological domains. Students at the junior and senior high school levels aged between 12 and 17 years are included in the tentative phase (Bahrin et al., 2024). There are four subphases in this tentative phase: the interest stage, the capacity stage, the value stage, and the transition stage. According to (Hotmauli, 2022), students will take an attitude towards something of interest during the interest stage of the



tentative phase. In this phase, students gain a comprehensive understanding of themselves and plan a career based on their self-awareness.

To help increase students' understanding of career planning, students' competence in planning their careers is necessary (Shen, 2022). Knowing one's abilities, interests, and potential should be the basis for choosing a post-graduation continuing education program (Rahayu, 2022). According to Permendikbud No. 111 of 2014, schools can help students grow according to their unique skills, interests, and abilities by offering Counseling Guidance services. Career planning skills are essential for every individual, including students at SMK GIKI 1 Surabaya. Career planning owned by students helps them select the type of further study and choose employment plans. Several concerns suggest that adolescents' ability to plan their careers remains low (Jumrotul et al., 2023). This is reflected in various problems, including the selection of the type of further study, the choice of employment plans, and those related to the unpreparedness of vocational school graduates to enter further education or the workforce.

One of the problems depicted by the field conditions shows that vocational students at SMK GIKI 1 Surabaya still lack the competence to plan their careers after graduation. This is because students still lack self-awareness regarding their skills, interests, and professional knowledge, which in turn has an impact on their lack of preparedness to plan a career after completing vocational education. Furthermore, many students then decide to pursue further education according to their parents' intentions rather than their competencies and talents. If the problems that arise are not given a concrete solution, this issue will not be resolved immediately, and students will have difficulty identifying future career paths. In general, concrete problems related to student career planning at SMK GIKI 1 Surabaya can be formulated into two aspects: the lack of competence and understanding in preparing career maps, and the failure to optimize the integration of digital technology in schools for preparing career maps. This community service program aims to enhance students' ability to develop career plans independently by using the mind mapping technique through the Coggle application.

Method

The method used in this community service employs a coaching approach based on the IGROW model (Holtshousen, 2015). The target of this training is students in SMK GIKI 1. Training activities will be supported by a team with expertise in the field of Learner Management and Counseling. To make the coaching process systematic and effective, the IGROW model is applied, which is based on five main components: Intention, Goal, Reality, Options, and Will/Way Forward. The IGROW method can be effectively used to help students in SIM prepare career maps. The use of Coggle in developing mind maps makes it easier for students to visualize their career journey, including its impact, goals, reality, options, and actions to be taken. This method provides a comprehensive and structured approach, enabling students to explore their potential independently and creatively.



Figure 1. Model coaching IGROW

To measure the level of student understanding regarding the use of Coggle for career mapping, an instrument was developed using a 5-point Likert scale, with questions focusing on various aspects of the application's effectiveness in career planning. This instrument was administered to students as part of both the pre-test and post-test phases of the study. The questions assessed students' perceptions of Coggle's ease of use, the clarity it provided in career mapping, and its effectiveness in enhancing confidence and motivation for career development. After collecting the responses, the data were analyzed using SPSS (Statistical Package for the Social Sciences) to evaluate the changes in students' perceptions and understanding before and after the training. Descriptive statistics were first calculated to determine the mean, standard deviation, and range of responses for both the pre-test and post-test.

Results and Discussion

Results

The Community Service activity was carried out, involving 36 students of SMK GIKI 1 Surabaya as active participants. This activity aims to equip students with the skills to plan their future careers more systematically, structurally, and in line with their potential, by utilizing digital technology in the form of the Coggle application as a medium for preparing career maps.



Figure 2. Presentation on the urgency of career mapping planning.



In general, the training process ran smoothly and received a positive response from both students and the school. Participants showed high enthusiasm, especially when the digital mind map practice session began. Students with different major backgrounds were able to follow the session adaptively, despite differences in their initial ability to use technology. However, with intensive assistance from the implementation team, all students were able to complete their career maps effectively. The resulting mind map reflects students' ability to visually design career paths, starting with interest mapping, goal setting, and further education plans, as well as developing career support skills.

As part of the training assessment, participants' level of understanding was measured through a pre-test and post-test. The pre-test was administered before the material was presented, while the post-test was administered after the training concluded.

Table 1. Pre test and Post test

Number	Pre-test Score	Post-test Score
Student 1	100	100
Student 2	100	100
Student 3	90	100
Student 4	90	100
Student 5	90	100
Student 6	100	100
Student 7	100	100
Student 8	100	100
Student 9	100	100
Student 10	90	100
Student 11	90	100
Student 12	90	100
Student 13	100	100
Student 14	100	100
Student 15	100	100
Student 16	90	100
Student 17	60	100
Student 18	100	100
Student 19	90	100
Student 20	90	100
Student 21	80	100
Student 22	100	100
Student 23	100	100
Student 24	80	100
Student 25	90	100
Student 26	100	100
Student 27	90	100
Student 28	100	100
Student 29	100	100
Student 30	100	100
Student 31	100	100



Student 32	90	100
Student 33	70	100
Student 34	100	100
Student 35	90	100
Student 36	100	100

Based on the results of the Paired Samples Test, the mean difference is -6.667 with a standard deviation of 9.258 and a standard error of the mean of 1.543. The 95% confidence interval for the mean difference is between -9.799 and -3.534. The calculated t value is -4.320 with 35 degrees of freedom (df) and a significance value (Sig. 2-tailed) of 0.000.

Table 2. Paired Samples Test

Paired Samples Test								
		Paired Differences				t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
					Lower	Upper		
Pair 1	pre post	-6.667	9.258	1.543	-9.799	-3.534	-4.320	.000

This result indicates a significant difference between the pre-test and post-test scores of the trainees. The negative mean value indicates that, on average, the post-test scores are higher than the pre-test scores, suggesting an increase in participants' understanding or ability after attending the training. A significance value smaller than 0.05 confirms that this difference is statistically significant. Thus, the Career Map Planning Training, conducted through Mind Mapping with the Coggle Application, is effective in enhancing students' understanding at SMK GIKI 1.

Discussion

The results of this study clearly demonstrate the significant positive impact of the Career Map Planning Training using the Coggle application. The substantial improvement between the pre-test and post-test scores is evident, with the calculated t-value of -4.320 and a p-value of 0.000, which confirms the statistical significance of the difference. This suggests that students' understanding of career mapping, goal-setting, and career support skills was notably enhanced after participating in the training. The use of Coggle, a digital mind mapping tool, played a crucial role in facilitating this improvement by providing a dynamic and interactive medium for students to visualize their career paths, interests, goals, and future educational plans.

Linking these findings to the IGROW coaching model (Goal, Reality, Options, Will) could help deepen the analysis of the training's effectiveness. The IGROW model emphasizes setting clear goals, understanding the current reality, exploring options, and committing to actions. In the context of this study, the use of mind mapping through Coggle aligns with the first three steps of the IGROW model, helping students map their career goals, reflect on their current abilities, and identify potential pathways to achieve their aspirations. The interactive nature of digital mind mapping also supports students' self-reflection and decision-making, which are key components of the IGROW model. As students visualize their career plans, they become more motivated and engaged, which enhances their ability to follow through with their career decisions. According to Grant (2014), the IGROW model is effective in coaching because it provides a structured approach that encourages both goal setting and self-reflection, which aligns well with the use of tools like Coggle.



Moreover, the findings from this study align with previous research, such as the work of Shen (2022) and Nurhasanah et al. (2016), who explored the effectiveness of digital tools and mind mapping in educational contexts. Shen (2022) demonstrated that digital mind mapping significantly improved students' ability to organize complex ideas and enhance problem-solving skills, which is consistent with the outcomes of this study, where students showed better career planning capabilities. Similarly, Nurhasanah et al. (2016) found that digital mind mapping tools fostered more engaged and motivated learning, reinforcing the results of this study, where students were highly enthusiastic during the digital mind mapping sessions.

In comparison, this study adds new insights into how digital mind mapping, specifically through Coggle, can be effectively used in career planning, an area that has not been extensively explored in prior research. The specific contribution of the Coggle application to learning improvement can be further explained through its ability to enhance visualization, self-reflection, and motivation. Coggle's user-friendly interface allows students to create visually appealing career maps that organize their thoughts and ideas in a clear and structured way. This visual representation not only aids in comprehension but also fosters deeper self-reflection, as students actively engage with their career goals and plans. According to Buzan (2010), visual tools like mind maps facilitate better recall and understanding by creating connections between concepts in a way that is both intuitive and memorable. Furthermore, the interactive nature of Coggle where students can adjust, modify, and expand their maps—creates an ongoing process of exploration and refinement, which supports continuous learning and career development. The motivational aspect of mind mapping should not be underestimated either; seeing one's career path visually mapped out can boost confidence and provide a tangible sense of direction. As noted by (Alabi, 2024) visual tools not only aid in learning but also inspire students to engage more deeply with the material.

Furthermore, the use of mind mapping tools in career guidance has been shown to align with the principles of constructivist learning theory, which emphasizes active, learner-driven experiences (Schunk, 1964). By allowing students to create their own career maps, Coggle encourages a student centered approach, giving learners the autonomy to reflect on their goals and make decisions based on their interests and abilities, which is central to constructivist pedagogy. This process of self-directed learning also ties into the concept of self-efficacy, as students who feel empowered to plan their own futures tend to be more confident in their ability to succeed (Bandura, 1997).

The incorporation of digital tools like Coggle in career guidance aligns with the growing trend of using technology in education to support personalized learning. According (Anderson & Krathwohl, 2001) the use of digital tools in the classroom can support higher-order thinking and provide learners with a more engaging and interactive learning environment. The use of digital mind mapping, specifically, allows students to engage with abstract career concepts in a more concrete and visual way, which helps them develop a clearer understanding of their career paths. Moreover, integrating technology into career planning supports the development of 21st-century skills, such as digital literacy, critical thinking, and problem-solving, which are crucial for future career success (Saavedra & Opfer, 2012).

These findings suggest that integrating digital based mind mapping in career guidance programs can serve as a sustainable and scalable model for other vocational schools aiming to enhance students' career readiness. By leveraging digital tools like mind mapping



applications, schools can create a more dynamic and interactive learning environment that adapts to the evolving needs of students in the digital age. This approach not only supports individual career exploration but also fosters essential skills such as critical thinking, problem-solving, and decision-making, which are crucial for success in the modern workforce.

Conclusion

Career map planning training for students of SMK GIKI 1 Surabaya, conducted through mind mapping analysis using the Coggle application, successfully improved students' understanding and skills in designing their career paths. With a coaching approach using the IGROW model, the training successfully equipped students with the ability to visualize and plan their careers systematically, including mapping their interests, further education goals, and required skills. Evaluation results showed a significant increase in students' understanding of career planning, as evidenced by the significant difference between pre-test and post-test scores. Therefore, this training proved effective in helping students prepare for their future careers in a more structured and potential-based manner.

Recommendation

As a follow-up to the Career Map Planning Training, it is recommended that SMK GIKI 1 Surabaya expand the use of the Coggle application or similar digital mind mapping tools across various subjects related to career development. This will allow students to gain a deeper understanding of how their skills and interests connect to potential career paths. Additionally, it is essential to provide ongoing professional development for teachers, equipping them with the knowledge and skills to effectively integrate digital tools into career guidance. To further enrich the students' learning experience, the school should introduce additional IT-related training, such as courses on data analysis, digital communication, and project management tools, which will enhance their technical skills for the modern workforce.

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