

# Development of a recommendation model for information technology-based college study program options for high school students

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## Abstract

Students who plan to attend university frequently struggle with making decisions. The challenge of students' decision-making regarding study program selection in higher education arises from factors such as self-understanding, including intelligence, talents, and interests, as well as understanding of the educational environment and available information on study programs. The objective of this research is to create a recommendation model for high school students in Yogyakarta to choose information technology-based study programs. A model is employed to aid guidance and counseling teachers in offering guidance to high school students regarding their choice of study programs in higher education. This guidance is based on the students' self-awareness and understanding of their surroundings. The research described in this study follows the Borg and Gall model, which consists of 10 development steps in the field of research and development (R&D). Data on the RPP-PT Model was obtained through questionnaires and interview guides. Data analysis involves the utilization of both quantitative and qualitative methods for analyzing data. The study presents a recommendation model for choosing information technology-based study programs in higher education. This model is designed to provide guidance and counseling teachers with recommendations for college study program choices based on students' learning achievement, general abilities, talents, and interests. External factors, including parental expectations, should be taken into account when considering future development.

**Keywords:** *college, high school student, information technology, recommendation model, study program choice*



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## **Introduction**

Students in high school have a great opportunity to continue their studies at university. Making decisions about choosing a college study program is important for students in high school. The professional trajectory of every individual over their lifetime is not a bestowed gift but rather a self-created and molded path (Syamal, et al., 2021). With the right study program, students have career prospects in the world of work or industry (Yonanda, et al, 2022). Selecting a major is a crucial decision for students as it not only determines their university coursework but also plays a role in shaping their options for graduate school, career paths, and potential income (Mullen, 2018).

According to the Indonesia Career Center Network (ICCN), as many as 87% of Indonesian students acknowledge that the major they have chosen is not in line with their interests (Awaliyah & Murdaningsih, 2019) Research by Wulandari, et al., (2022) revealed that several problems may arise when students feel they are in the wrong major, including psychological, academic, and relational issues. Psychological issues manifest through discomfort when attending lectures perceived as incompatible with their interests or talents. Academic problems are indicated by suboptimal performance. Meanwhile, relational problems arise when students withdraw from their environment due to discomfort with the academic situation. On the contrary, students who choose a major aligned with their interests result in an improvement in the learning processes during their academic studies (Masriah, 2019).

Decision-making problems are often experienced by students who will continue their education to higher education (Yonanda, et al, 2022). Despite various factors influencing the choice of a program, students typically make their decisions independently, as the primary beneficiary of the decision is the student alone (Rico-Briones & Bueno, 2019). Students tend to experience anxiety about their future aligns with their confusion regarding career planning in higher education (Maharani, et al., 2021). Based on research by Seniawati, et al (2014), students have not thought about their future or the direction of their skills due to a lack of career knowledge to develop. The limitation in knowledge regarding various career options also poses a problem, impacting the individual's ability to explore their career choices (Putra, 2018).

Many students opt for advanced studies incongruent with their talents, interests, and desired career goals due to choosing schools solely based on a limited self-understanding (Ghassani & Anwar, 2020). Apart from that, students do not yet understand themselves and their potential in terms of intelligence, talents and interests. The understanding of career perspectives among graduates remains notably low, as evidenced by the percentage exceeding 41% for both the 2018 and 2019 cohorts (Simbolon, 2019). Research from Yonanda, et al (2022) states that students choose study programs that are considered easy to enter and easy to complete or easy to get a degree so that they can find work more quickly, which will later have a salary. This is because it shows their interest in knowledge and talent, which results in students often choosing study programs because they follow their friends, parents, siblings, teachers or the environment, not based on talent or interest. In choosing the right career, a student needs to see all his potential strengths and weaknesses and want to be himself (Fikriyani, 2021). Mistakes in determining a study program can have an impact on learning difficulties and difficulties in future careers (Yonanda, et al, 2022). The research conducted by Fahima and Akmal (2018) revealed that students experiencing career confusion tend to decide to switch majors because they feel that the current major is not aligned with their interests.

Apart from phenomena related to students' lack of understanding of their own abilities, students' lack of understanding of information about study programs in higher education also contributes to students' mistakes in making the right decisions regarding their choice of study program. Understanding of self and the environment (related to study programs in higher education) influences students' feelings in choosing a study program. Self-understanding refers to the ability of an individual to identify strengths and weaknesses within oneself, enabling the person to have responsive sensitivity to the demands arising from their environment (Aryani &

Rais, 2018; Lidyasari, 2019). Self-understanding is important for every individual in understanding himself realistically, both his strengths and weaknesses, based on accurate and valid information about himself as material for consideration in self-direction, determination and decision making related to the career or job he will enter (Kartianti, 2021).

One of the responsibilities of a guidance and counseling teacher is to support students in the process of career development, involving a range of activities and participating in one-on-one career counseling sessions (Arshad, & Author, 2018; Abubakar, 2019). They must consistently enhance their knowledge and expertise, staying updated on the latest information regarding career decision-making assessments. They should also be familiar with settings that can aid them in selecting the most suitable assessment tools (Kulcsar, et al., 2019). In terms of students' self-understanding, guidance and counseling teachers can carry out assessments with both test and non-test instruments. In understanding the environment which is related to information on study programs in higher education, guidance and counseling teachers can provide career information services, especially regarding study programs in higher education. The readiness of an individual in anticipating the future is the starting point for success, while unpreparedness in current-era career planning can result in

Furthermore, guidance and counseling teachers need to help in directing students to choose the right study program. One of them is by providing recommendations for study program choices in higher education, where previously a complete assessment needs to be carried out using both test and non-test instruments and also providing career information, especially about study programs in higher education. The recommendations given by the guidance and counseling teacher will be appropriate and help direct students appropriately. So far, guidance and counseling teachers provide recommendations manually with limited understanding of students themselves and the environment that students need.

Apart from that, recommendations based on information technology are needed to more efficiently and effectively reach all students in need. Information technology is a crucial factor in the guidance and counseling process by school guidance counselors. The utilization of information technology is expected to encourage guidance counselors to be more creative, innovative, and varied in seeking the latest information during the counseling process (Triyono & Febriani, 2018; Ilfana & Herdi, 2022). Utilizing tools and services grounded in information technology can maximize the effectiveness of technology's contribution to guidance and counseling services, whether provided in a classical, group, or individual context (Zaini et al., 2020; Sumarwiyah & Zamroni, 2017). Career services will be adequate when employing information technology to enhance students' career planning and maturity (Arsyad, 2018; Ghassani & Anwar, 2020; Herdi, 2021).

Thus, this research will develop a recommendation model for information technology-based study program choices for high school students in Yogyakarta. The model is used to assist guidance and counseling teachers in providing direction to high school (SMA) students regarding selecting study programs in higher education based on students' self-understanding and understanding of their environment.

## **Method**

This research is Research and Development (R & D) which produces products. The resulting product is a recommendation model for information technology-based higher education study program options (RPP-PT) for high school students in Yogyakarta. This research refers to the Borg and Gall (1983) model design with development steps: (1) conducting preliminary research and collecting data information needed for product development (literature review and needs analysis); (2) planning (defining concepts, formulating goals); (3) developing initial product forms (preparation of tentative model materials); (4) carry out initial field tests (carried out by experts); (5) revise the initial field test results; (6) conduct the main field test (conducted on a larger number of subjects); (7) carry out revisions of the main field test; (8) conducting

operational field tests; (9) revise the final product; (10) disseminate and implement products. The subjects in this research were grade 11 students at SMAN 5 Yogyakarta.

There are two types of research data, namely test result data, namely intelligence, talent and interest data and data about the RPP-PT model. Test result data is collected through psychological test assessments including intelligence, talent and interests as well as interviews. For this reason, the instruments used are the CFIT intelligence instrument, the DAT Talent instrument, and the RMIB Interest Inventory. Meanwhile, research data regarding the RPP-PT Model was collected through questionnaires and interview guides. The questionnaire instrument was used as the main method, while interviews were used as a complementary method. Research data was analyzed using quantitative and qualitative data analysis methods. Quantitative data analysis is used to analyze data from expert tests, and analysis of the feasibility of using the model, while qualitative data analysis is used to analyze suggestions and comments from experts regarding the feasibility of the Recommendations for Choice of Study Programs in Higher Education (RPP-PT) model.

## **Findings and Discussion**

Developing a Recommendation Model for Study Program Choices in Information Technology-based Higher Education begins with conducting literature and literature reviews as well as needs analysis. There is several supporting literature as a basis for developing models published by the government, including: a. High School and Vocational School Student Specialization b. Specialization and Cross-Interest Models c. Student-specialization-component-assessment-module d. Published Specialization Guide. Based on the results of the literature review, the model should not only use non-test instruments but also use tests. Based on information from Guidance and Counseling teachers at SMAN 5 Yogyakarta, the use of specialization still relies on non-test instruments and not many use psychological tests because not all schools provide a budget for testing services for high school students for specialization activities. Planning begins with defining concepts and formulating objectives for developing a Recommendation Model for Information Technology-based Study Program Choices in Higher Education for High School Students in Yogyakarta.

This specialization model design for high school students will use information from psychological test results. The format for making models uses the Spreadsheet program from Microsoft, namely using Microsoft Excel to create computer-based designs. Initial product development began by carrying out psychological tests at SMA N 5 Yogyakarta. These results are used to fill in the model form to be developed. The form developed consists of three worksheets, namely: a. Front or Home page worksheet b. Worksheet containing Form Data regarding Class Data on Psychological Test Results c. Worksheet containing Classical Report Form Data on Psychological Test Results d. Worksheet containing Individual Psychological Test Report Form Data as a Recommendation Model for Information Technology-based Study Program Choices for High School Students in Yogyakarta.

Model validation was carried out by 2 experts, namely 1 counselor and 1 psychologist from the Guidance and Counseling Services Technical Implementation Unit. Model revision activities from expert validation to determine the model to be more effective for filling in specialization data consisting of learning achievement data, non-test data and psychological test data. The model trial was carried out on students at SMAN 5 Yogyakarta. Improvements were only made to the interest choices, narrowing them down to the 3 main interest choices from the results of the interest tests carried out by students so that their individual reports which were initially displayed in their entirety were only displayed briefly on the 3 interest choices.

After revisions were carried out, an operational field test was carried out by providing test services to students of SMAN 5 Yogyakarta. Based on the results of the t test, a value of 0.000 was obtained, which is smaller than 0.05, so there is a difference in the accuracy of

recommendations for choosing a study program based on aspects of self-understanding, understanding the environment and the accuracy of choosing a study program for students. The results of the descriptive analysis show that the average post-test score is higher than the pre-test average, namely  $81.5 > 55.4$ . This shows an increase in the accuracy of guidance and counseling teachers' recommendations for students' choice of study program after the model was implemented. Thus, the model has a significant effect on the accuracy of guidance and counseling teachers' recommendations based on aspects of self-understanding, understanding the environment and the accuracy of students' choice of study program. Based on the results of the data above, a discussion was held regarding the inappropriateness of the specialization model for one of the students. Discussions were held with expert validators who first tested this specialization model, namely counselors and psychologists who have experience administering psychological tests. Based on this discussion, it was concluded that the data used to adjust recommendations for choosing study programs in higher education came from data from psychological test results because it was in accordance with the comparison of potential values which tended to be stable or fixed.

The results of the revisions in the final product are used as material to finalize the specialization model for high school students. The final results of this model consist of: a) Worksheet - Class Data b) Worksheet - Classical Report Data c) Worksheet - Individual Report Data. The recommendation model for choosing study programs in higher education above, after going through a trial and revision process, concluded that the expert stated that this model was feasible and could be used for specialization in choosing study programs in high school, meanwhile, based on the needs of the school, represented by guidance and counseling teachers, they were able to facilitate the needs. specialization for recommendations for study program choices that are expected to be in accordance with learning achievements, general abilities, talents and interests.

Based on testing the results of psychological tests given to students, it was found that suitability in providing recommendations was 97%, meaning that this model could be used as an alternative recommendation model for choosing study programs in higher education for high school students. In the testing phase on the subject, it was found that parents' wishes were one of the obstacles that caused the recommendations given using the specialization model to be inappropriate for the students. This problem often occurs because parents' expectations of children do not match the child's competencies (Hariyanto et al., 2014; Kustanti, 2019; Miski & Mawarpury, 2017). The specialization model for high school students is a product based on Ms. Excel has been proven effective in helping students determine further studies. This model also makes it easier for guidance and counseling teachers to provide appropriate specialization recommendations to students, so that problems with wrong majors can be minimized. This is confirmed by Diana (2018) that emphasizes the necessity of information technology in guidance and counseling to assist guidance counselors or counselors in providing guidance and counseling services more easily and effectively, thereby enhancing the overall process of guidance and counseling services. Although external factors such as parents' expectations must be taken into account to ensure that the specialization recommendations given are in accordance with the student's competency and potential.

## **Conclusion**

The development of model starts from (1) conducting preliminary research and collecting data information needed for product development (literature review and needs analysis); (2) planning (defining concepts, formulating goals); (3) developing initial product forms (preparation of tentative model materials); (4) carry out initial field tests (carried out by experts); (5) revise the initial field test results; (6) conduct the main field test (conducted on a larger number of subjects); (7) carry out revisions of the main field test; (8) conducting operational field tests; (9) revise the final product; (10) disseminate and implement products. From the development results, it is

known that the information technology-based model for recommending study program choices in higher education institutions is suitable for use in providing recommendations for appropriate college study program choices to students from guidance and counseling teachers according to learning achievement, general abilities, talents and interests. In this way, the problem of wrong majors can be minimized even though external factors can become obstacles such as parental expectations. This becomes the basis for subsequent model improvements. The information technology-based Specialization Model using Microsoft Excel will later become a model prototype that can be developed better using other Android-based and internet-based programs for further development.

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