**Journal of Informatics and Vocational Education (JOIVE)**
Vol.7, No.1, March 2024, pp. 17~22
ISSN: 2746-7813


# The Influence of Initial Ability and Learning Motivation on Project Completion in Web and Mobile Programming Subjects

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**Article Info**

***Article history:***

Received Jan 24, 2024
Revised Jan 24, 2024
Accepted Jan 30, 2024

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**ABSTRACT**

The purpose of this study is to determine the influence of student's initial ability and learning motivation on project completion in web and mobile programming subjects. The study was conducted using a descriptive and qualitative approach. The study subjects were class XII students of a state vocational school in Surakarta. The study was conducted in three phases: determining initial ability, determining the level of learning motivation, and analyzing the relationship between initial ability and learning motivation when completing a project. An initial ability assessment was conducted with 36 students before starting the web and mobile programming course. The determination of the level of motivation takes place after the learning process, and the final phase occurs after the learning process's completion. Data collection techniques include interviews and tests. The results of the study show that students' initial ability has a significant impact on project completion in web and mobile programming subjects.

**Keywords:** Initial ability, Learning motivation, Subject project, Vocational school, Web and mobile programming

## 1. INTRODUCTION

The achievement of learning goals is not only influenced by students's initial (cognitive) abilities but also by psychological factors (Hendratmoko et al., 2018). This statement is supported by Koko (2020) who states that the psychological factors that influence the achievement of learning goals are social context, emotions, learning autonomy, learning discipline, and individual personality. All these elements are interconnected and therefore represent a unity of characteristics that are inseparable from humans. Therefore, students with high initial ability tend to be more motivated to learn than students with low initial ability. However, several learning models with a collaborative inquiry learning approach can enhance students' experiences by honing their discipline, teamwork, communication, and feeling of accountability (Susanti et al., 2023).

Andriani and Rasto (2019) argue that learning motivation is one of the internal factors that influence learning success. Learning motivation is a psychological driving force that guides and promotes learning according to the learning goals to be achieved. Learning motivation motivates students to study further to achieve their learning goals. Students who are highly motivated to learn are more likely to reach their full potential to achieve their learning goals (Copriady, 2014). This shows that learning motivation is closely related to a person's emotional or psychological aspects. The level of motivation for learning is also influenced by students's initial abilities.

The level of motivation to learn tends to correspond to a student's initial ability, and students with higher initial ability are generally more motivated to learn than those with lower initial ability. However, it must be recognized that this does not prevent initially low-ability students from actually demonstrating high learning motivation. Other factors such as interests, personal motivation, and educational environment may also play an important role in shaping students' motivation to learn, ultimately influencing the dynamics of the interaction between initial ability and motivation to learn, it highlights the complexity.

RPL is one of the competencies that can be obtained at a state vocational high school in Surakarta. RPL competency includes subjects related to web and mobile device programming. RPL students in class XII are students of varying initial abilities. Therefore, it is important to understand the influence between students's initial ability and learning motivation as it affects project completion in web and mobile programming subjects. The possibility that a student's initial ability is high but his motivation is low is derived from the student's attitude during the learning process.

Based on the above description, this study aims to study in more detail the initial learning ability and learning motivation of students, especially the influence of teaching, and to help teachers plan learning activities in the best possible way. It is intended to enable you to do so. Make these even more convenient. Steady with the research findings of Rizkiana et al. (2016), who states that meaningless learning ultimately leads to students becoming bored and less motivated to participate in learning activities.

## 2. RESEARCH METHOD

This research method was conducted using a qualitative approach. According to Sugiarto (2019), it is a research design that aims to describe an event or incident in a systematic, accurate, and detailed manner. This research interests are in the subjects of web and mobile programming, which is one of the subjects for class XII RPL competency. The participants of this study were 36 students of class XII RPL from a state vocational school in Surakarta.

Data collection occurred during or after the teacher conducted learning exercises in web and mobile programming subjects. This learning process was designed in two separate meetings, with the project presented at the first meeting and completed at the end of the second meeting. Through this method, students not only gain conceptual understanding but also apply the gained knowledge to real projects. A project closure process at the end of the second meeting provides students with an opportunity to identify areas that require improvement or further understanding.

Data collection is divided into three phases: knowing the initial ability, knowing the level of learning motivation, and analyzing the impact of initial ability on learning motivation. Initial abilities are determined by how much the student knows and understands the content being taught. This phase is carried out before students receive the subject material on web and mobile programming by completing a pre-test before starting their studies. Pre-tests or initial tests are used when teaching material to check how well students have mastered the material being taught (Matondang, 2009). Pre-tests use online media, because support through media is additionally essential, one of which is through online media which additionally supports production of inventiveness (Afghani, 2021).

In the second phase, the student's level of motivation to learn is determined. To understand the level of students's motivation to learn, we conducted interviews with students one after another. According to Sarosa (2012), interviews are one of the most widely used tools to collect qualitative research data. Interviews allow researchers to collect diverse data from respondents in different situations and contexts. This phase is carried out in her second meeting when the student receives the learning materials from the teacher. Interviews were conducted concurrently with the initial learning activities before the core learning activities were conducted.

In the third step, an analysis of the influence of initial ability and learning motivation on project completion in the subject of web and mobile device programming was carried out. Data collection in this study was conducted using a pretest tool and learning motivation interviews with students. Data from all instruments were then analyzed to determine the relationship between initial ability, motivation to learn, and student project completion. This data will be used as the basis for determining future study plans.

## 3. RESULT AND ANALYSIS

Agreeing with Wolcott (1994), portrayal could be a subjective representation that makes a difference perusers see what they see and listen to what they listen. A solid and clear establishment of your information permits for higher-level examination and elucidation. So, the data analysis method was performed using descriptive analysis based on observation data obtained in the field. Descriptive analysis is used to determine the extent to which students have the initial ability, and motivation to learn and complete professional projects by comparing research data (Sudijono, 2001).

### 3.1. RESULT

#### 3.1.1. INITIAL ABILITY

Hasrida (2017) separated initial abilities into two, to be specific high initial ability and low initial ability. Understudies with high initial ability have scores higher or break even with the passing review, whereas understudies with low initial ability have scores lower than the passing review. Suharsimi (2013) clarifies that the elucidation of students' starting numerical capacity categories is decided utilizing the normal esteem and standard deviation.

The initial ability data used in this study is the result of a pretest conducted at the beginning of learning. According to the results of the pretest, the students's lowest score was 47 points and the highest score was 80 points. The average initial ability score of the 36 students was 68,36 points. Information about these initial abilities is recorded as follows and displayed in Table 1.

Table 1. Initial Ability Data

| Initial Ability Level | Intervals | Number of Students | Percentage |
|---|---|---|---|
| High | X > 68,36 | 20 | 56% |
| Low | X < 68,36 | 16 | 44% |
| | Total | 36 | 100% |

The data on students's initial abilities can be divided into two main groups: those with high initial abilities and those with low initial abilities. This initial skill grouping is based on the results of a pretest given to students. The high initial ability group consists of students whose pretest scores are above the class average. In other words, the low initial ability group consists of students whose pretest scores are below the class average. Instructors also must watch how their students behave while they are learning. This can enhance learning outcomes by assisting teachers in comprehending emerging issues (Farhan et al., 2017).

#### 3.1.2. LEARNING MOTIVATION

The data on learning motivation used in this study was the result of an interview conducted at the beginning of the class, more precisely at the second interview. Information regarding the level of learning motivation was recorded as follows and displayed in Table 2.

Table 2. Learning Motivation Data

| Level of Learning Motivation | Number of Students | Percentage |
|---|---|---|
| High | 28 | 78% |
| Low | 8 | 22% |
| Total | 36 | 100% |

Uno (2023) in his research, indicators of learning motivation include I found that there is something this, below: (1) desire and desire to succeed, (2) there is a need for encouragement and learning, (3) having hopes and aspirations for the future, (4) feeling grateful for the learning, (5) there are interesting learning activities, and (6) the existence of a learning environment in which students can learn well. According to this study, students who meet more of these indicators are more motivated to learn. Students who want to continue their studies after leaving school have a drive and desire to succeed, a need for encouragement and learning, and have hopes and dreams for the future. It is also suitable for students working in the field of software engineering after leaving school. On the other hand, students who are less motivated to learn meet fewer of these indicators.

Data regarding students' learning motivation can be broadly categorized into two groups based on their learning motivation level: high learning motivation and low learning motivation. This motivation level grouping is based on the results of individual interviews with students. The most motivated group consists of students who continue their studies after leaving school or work in the field of software engineering and need good grades. On the other hand, the group with low motivation to learn consists of students who get a job after graduating from school, but do not work in the field of software engineering and therefore do not attach importance to grades. Project work, however, needs a more theoretical understanding of programming as well as the tasks and circumstances of projects in which the course uses the project work approach, in order to be a useful motivating tool (Ampofo & Ampofo, 2022).

### 3.1.3. PROJECT COMPLETION

This subject uses a project-based learning model that applies theory, skills, techniques, and real-world solutions (Makrufi et al., 2018). One of the project-based learning elements is the project completion mechanism (Audet & Jordan, 2005). The project completion data used in this study are the final results of the web and mobile programming subject's project collected at the end of the second meeting lesson. Information regarding the completion results of this project was then recorded and is shown in Table 3 below.

Table 3. Project Completion Data

| Project Completion Results | Number of Students | Percentage |
|---|---|---|
| Complete | 26 | 72% |
| Not complete | 10 | 28% |
| Total | 36 | 100% |

Data on the results of students completing web and mobile programming subjects' projects can be divided into two large groups. Results of completed and uncompleted projects. This project completion grouping is based on whether a web and mobile programming project was completed by the student. The completed project group consists of students who complete a project according to a worksheet provided by the teacher. On the other hand, groups resulting from incomplete projects consist of students who did not complete the project or did not follow the worksheet provided by the teacher.

## 3.2. ANALYSIS

A table compares each student's first-phase data on initial skill level, second-phase data on learning motivation, and third-phase data on project completion performance. Information comparing initial ability, learning motivation, and project completion was then collected and is presented in Table 4 below.

Table 4. Data of All Students

| No | Initial Ability Level | Learning Motivation Level | Project Completion |
|---|---|---|---|
| 1 | Low | Low | Not complete |
| 2 | Low | High | Complete |
| 3 | High | High | Complete |
| 4 | High | High | Complete |
| 5 | Low | High | Complete |
| 6 | High | High | Complete |
| 7 | Low | High | Complete |
| 8 | Low | High | Complete |
| 9 | High | Low | Not complete |
| 10 | Low | Low | Not complete |
| 11 | Low | High | Complete |
| 12 | High | High | Complete |
| 13 | Low | High | Not complete |
| 14 | High | Low | Not complete |
| 15 | High | High | Complete |
| 16 | Low | High | Complete |
| 17 | High | High | Complete |
| 18 | High | High | Complete |
| 19 | High | Low | Not complete |
| 20 | Low | Low | Not complete |
| 21 | Low | High | Complete |
| 22 | Low | High | Complete |
| 23 | High | High | Complete |
| 24 | High | High | Complete |
| 25 | Low | High | Complete |
| 26 | High | High | Complete |
| 27 | High | High | Complete |
| 28 | Low | High | Complete |
| 29 | High | High | Complete |
| 30 | High | High | Complete |
| 31 | High | High | Complete |
| 32 | High | High | Complete |
| 33 | High | High | Complete |
| 34 | Low | High | Not complete |
| 35 | High | Low | Not complete |
| 36 | Low | Low | Not complete |

The findings provide data on the relationship between students' initial ability level, level of learning motivation, and ability to complete the project. Research shows that students's initial ability greatly influences their success in completing professional web and mobile programming projects. Students with a high level of foundational knowledge tend to be better at tackling specific programming projects. In contrast, students with lower initial ability may face greater challenges in completing their projects. This is an important reminder of the importance of understanding a student's initial ability before learning web and mobile programming.

Further research has shown that students's learning motivation can also influence their success in completing professional projects related to web and mobile device programming. Highly motivated students are often able to successfully handle a given programming project, even if their initial abilities are low. On the other hand, some students may have strong initial ability but low motivation to learn and may face significant challenges in completing their projects. It has been proven that motivation to learn corrects students's initial ability deficiencies and enables them to complete projects on time.

When we aggregate data on students's project completion results by initial ability group, we find that students with higher initial ability are also more motivated to learn. This is because a high level of initial understanding significantly increases students's motivation to complete a given project. Characteristics of students with different initial abilities determine how they absorb, react, and process the information provided to them. The high initial ability makes it easier for students to actively participate in the learning process, which generates learning motivation (Danial et al., 2017) and makes students more motivated to complete projects on time.

Ultimately, teachers can use these findings as a basis for adapting future teaching approaches. For students with low initial ability, teachers can motivate them to learn, overcome, obstacles, and complete projects. On the other hand, students with higher starting ability can be given additional challenges to keep them motivated and improve their ability. This research may also form the basis for developing support or enrichment programs for students. Therefore, this study makes an important contribution to the development of better programming education aimed at the success of all students.

## 4. CONCLUSION

The results of the study show that students's initial ability has a significant impact on project completion in web and mobile programming subjects. The findings indicate that there is a relationship between initial ability, learning motivation, and project completion in web and mobile programming subjects. Students with higher initial ability are better able to complete projects, but motivation to learn also plays an important role. High motivation can overcome the limitations of initial ability, but students with high initial ability but low motivation may encounter difficulties.

These results highlight the urgency of understanding and addressing students's initial ability and motivation in programming classes. Teachers can use the results of this study to adapt their teaching approaches and motivate and challenge students. It can also be used to prepare remedial and enrichment programs appropriate to students's initial achievement levels and learning motivations to promote more effective learning.

## ACKNOWLEDGEMENTS

We would like to express our deep gratitude to all the lecturers, teachers, students, and PPG students who supported us in facilitating this research.

## REFERENCES

Afghani, D. R. (2021). Kreativitas Pembelajaran Daring Untuk Pelajar Sekolah Menengah Dalam Pandemi Covid-19. *Journal of Informatics and Vocational Education*, *3*(2). https://doi.org/10.20961/joive.v3i2.43057

Ampofo, I. A. S., & Ampofo, I. A. J. THE INFLUENCE OF PROJECT WORK APPROACH ON COLLEGE STUDENTS'INTEREST IN PROGRAMMING AT THE PRIVATE UNIVERSITIES IN GHANA. *IJIE (Indonesian Journal of Informatics Education)*, *6*(1). https://dx.doi.org/10.20961/ijie.v6i1.59461

Andriani, R., & Rasto, R. (2019). Motivasi belajar sebagai determinan hasil belajar siswa. *Jurnal Pendidikan Manajemen Perkantoran*, *4*(1), 80-86. https://doi.org/10.17509/jpm.v4i1.14958

Audet, R. H., & Jordan, L. K. (Eds.). (2005). *Integrating inquiry across the curriculum*. Corwin Press.

Copriady, J. (2014). Penerapan spbm yang diintegrasikan dengan program exe learning terhadap motivasi hasil belajar mahasiswa pada mata kuliah kimia dasar. *Jurnal Pendidikan*, *5*(2), 95-105. http://dx.doi.org/10.31258/jp.5.2.95-105

Danial, M., Gani, T., & Husnaeni, H. (2017). Pengaruh model pembelajaran dan kemampuan awal terhadap kemampuan berpikir kritis dan pemahaman konsep peserta didik. *Journal of Educational Science and Technology*, *3*(1), 18-32. https://doi.org/10.26858/est.v3i1.3509

Farhan, S., Ranto, R., & Basori, B. PENGARUH PENERAPAN PENDIDIKAN KARAKTER MELALUI MODEL PEMBELAJARAN STUDENT TEAM ACHIEVEMENT DIVISION TERHADAP HASIL BELAJAR PEMELIHARAAN MESIN KENDARAAN RINGAN SMK PANCASILA SURAKARTA. *Jurnal Ilmiah Pendidikan Teknik dan Kejuruan*, *10*(2), 47-55. http://dx.doi.org/10.20961/jiptek.v10i2.16862

HASRIDA, H. (2017). *Pengaruh Model Pembelajaran dan Kemampuan Awal terhadap Pemahaman Konsep dan Motivasi Belajar Peserta Didik Kelas X SMA Negeri 1 Maniangpajo (Studi pada Materi Pokok Larutan Elektrolit dan Nonelektrolit)* (Doctoral dissertation, Pascasarjana).

Hendratmoko, T., Kuswandi, D., & Setyosari, P. (2018). Tujuan Pembelajaran Berlandaskan Konsep Pendidikan Jiwa Merdeka Ki Hajar Dewantara. *Jurnal Inovasi dan Teknologi Pembelajaran (JINOTEP): Kajian dan Riset Dalam Teknologi Pembelajaran*, *3*(2), 152-157. https://dx.doi.org/10.17977/um031v3i22017p152

Koko, K. (2020). Implementasi Konsepsi Tujuan Pembelajaran PAI Untuk Menghadapi Era Revolusi 4.0. *EduTeach: Jurnal Edukasi Dan Teknologi Pembelajaran*, *1*(2). https://doi.org/10.37859/eduteach.v1i2.1964

Makrufi, A., Hidayat, A., & Muhardjito, M. (2018). Pengaruh Model Pembelajaran Berbasis Proyek terhadap Kemampuan Pemecahan Masalah Pokok Bahasan Fluida Dinamis. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, *3*(7), 878-881. https://dx.doi.org/10.17977/jptpp.v3i7.11291

Matondang, Z. (2009). Evaluasi pembelajaran.

Rizkiana, F., Dasna, I. W., & Marfu'ah, S. (2016). Pengaruh praktikum dan demonstrasi dalam pembelajaran inkuiri terbimbing terhadap motivasi belajar siswa pada materi asam basa ditinjau dari kemampuan awal. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, *1*(3), 354-362. https://dx.doi.org/10.17977/jp.v1i3.6161

Sarosa, S. (2012). Penelitian kualitatif dasar-dasar. *Jakarta: Indeks*.

Sudijono, A. (2001). Pengantar evaluasi pendidikan.

Sugiarto, E. (2019). Menyusun Proposal Penelitian Kualitatif Skiripsi Dan Tesis.

Suharsimi, A. (2006). Prosedur penelitian suatu pendekatan praktik. *Jakarta: Rineka Cipta*, *134*.

Susanti, W., Tendra, G., Yuliendi, R. R., Simeru, A., Johan, R. M., & Mulya, R. (2023). The Inquiry Collaborative Learning Design Virtual Laboratory Based and Remote Virtual. *Indonesian Journal of Informatics Education*, *7*(1), 1-7. https://doi.org/10.20961/ijie.v7i1.77292

Uno, H. B. (2023). *Teori motivasi dan pengukurannya: Analisis di bidang pendidikan*. Bumi Aksara.

Wolcott, H. F. (1994). *Transforming qualitative data: Description, analysis, and interpretation*. Sage.