

Influence of Study Skills on the Dropout Rate of Universities: Results from a Literature Study

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Abstract. A high dropout rate from universities has been a topic of interest in educational research for more than a decade. The withdrawal from the university on the one hand is frustrating for the students and their families, and on the other hand mostly means a waste of time and money. Tailoring every higher education program to each students' learning styles and needs is difficult. However, mastering the requisite study skills at the pre-university phase (K-12) is considered one of the solutions to diminish university dropouts. By conducting a literature study, we identified relevant study skills and their influencers as well as the appropriate period to improve these skills. We created a model illustrating the relationship between five study skill categories, their influencers and their effects on dropout from university. This study aims to increase awareness and active stakeholders such as families, teachers, and universities for cooperating to strengthen the study skills of school students.

Keywords: Study skills · Study habits · Learning skills · Dropout
Academic success · Intervention studies · K-12

1 Introduction

Education plays a crucial role equipping generations who will shape their future directly and the society that they live in indirectly [1]. Therefore, the formal education is important because skills and strategies are acquired during this period. Learners will use these skills and strategies during a life-long learning period outside the classroom starts. One of the aims of the Bologna Process is to make higher education accessible for people from different backgrounds and qualification [2]. This is one reason that the number of the students enrolling to higher education has been increasing gradually in recent years, and thus, student groups are becoming more heterogeneous [3]. In this sense, heterogeneous group means consisting of students from different academic and family backgrounds along with different learning styles and paces. As it might be difficult to tailor higher education for each of the students' learning styles and needs, dropouts from the study programs might occur. Thus, the higher enrolment rate to university does not always result in a proportional number of graduates from the study programs. Especially in the natural sciences, the failure rate is noticeably higher compared to other fields of

science. A report published by Brugger et al. [4] related to German universities and the period between 2002 and 2010 shows a dropout rate of 34.6% in natural sciences and 27.3% in engineering sciences. For this reason, educational researchers have focused on the topic of dropouts from higher education during the last decades. Higher education targets successful completion of study programs to reinforce the well-being of their individuals in society. The Europe 2020 strategy plans the action of reducing dropout and increasing completion rates of 30-34-year-olds by at least 40%. This goal is important to create high-level skills for fostering innovation, productivity, and social justice in societies [5].

The high dropout rates have a series of repercussions on different stakeholders and contributors. “*Retention not only has an impact on the individual and his/her family but also produces a ripple effect on the postsecondary institutions, the work force and the economy*” [6]. By preventing university dropouts, more students will achieve secondary education as a successful entry to their working life, and families, teachers, and universities reap the rewards of their invested time, effort, and money on students’ achievement. Literature shows us several factors that might help to improve the study success [7]. One of these factors is having good study skills which would be seen as a part of students’ personal, academic, and professional development [8]. “*As a general term, study skills include all those activities necessary to manage learning and to handle tests*” [9]. Mastering these skills is very important, crucial for students. Improving them in an early phase of life is important to have a smooth transition to university and to graduate successfully from the bachelor’s program. Early identification and intervention of deficiencies in skill set during students’ pre-university phase – also known as K-12¹ [10] – reinforces student success in educational career, and students continue their educational track without the fear of failure [11]. The K-12 students should be supported to become self-regulated learners so that they can take active control of their own learning process, direct their own efforts to acquire knowledge and skills rather than depending on teachers or parents [12].

The motivation of this contribution is to explore the literature and to unearth during which phases of lives the school students’ study skills should be improved. Furthermore, to find out who supports students to gain these skills and whether there is a strong correlation between the study skills of students and their dropout rates from higher education are the motivation of this study. Currently, the influence of study skills on the dropout rate of universities is only partly researched and there is still a lack of knowledge which offers a holistic view of the correlation of improving study skills and reducing dropout rate. Furthermore, it is also interesting to investigate the complexity and the details of the question ‘who is able to strengthen study skills’: e.g. the K-12 students themselves, their families, the schools, or even the universities (so-called influencers). Therefore, this paper aims to answer to following research questions:

1. *What is the relationship between study skills and the dropout rate at universities?*
2. *Which influencers can best promote these study skills?*

¹ “The K to 12 Program covers Kindergarten and 12 years of basic education [...]” GOVPH. (n.d., 04.04.2017). *WHAT IS K TO 12 PROGRAM?* Available: <http://www.gov.ph/k-12>.

Most educators would agree that students' dropout problem from schools or higher education institutions is a problem. In addition, families might read news about the latest school dropout numbers. Therefore, the implications of this study will increase consciousness and activate stakeholders such as families, teachers, and universities for cooperating to strengthen the study skills of school students. Moreover, they will help K-12 students and their families, as well as schools and universities to find both the requisite study skills and the appropriate starting point to improve study skills of K-12 students. In the long term, our research aims at reducing dropout rate at universities. Figure 1 shows the research model of our research showing the described relationships.

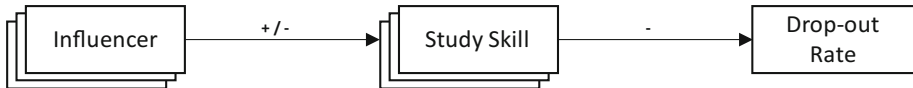


Fig. 1. Research model (own illustration)

This review article started by explaining the current situation of higher education regarding the higher dropout rates and the possible solution of implementing study skills into the K-12 education. In the second part, we provide a brief overview of the current state of the art concerning the enhancement of study skills for further academic achievement. Next, we explain the literature research methods adopted for this study. In the last part, we present the results of the literature research and the model that we developed from these results. Then we conclude this article with presenting the implications of this study.

2 Study Skills and Academic Achievement-State of the Art

One of the preventive alternatives is improving the study skills of the students before starting an academic program [7]. Study skills indicate students' knowledge of applicable study strategies and methods, their competence of time management, and other sources to complete academic tasks [13]. A research conducted by Asikainen et al. [14], which aimed to improve study skills of bioscience program students, showed that when organizing and time management skills strengthened, study success and grades become higher. Basically, study skills include all those activities necessary to manage learning and to handle tests at the university level [15]. Robbins et al. defined study skills as all activities that are directly related to productive class performance at school. And this productive class performance determine the ability to pursue and successfully graduate a university program [15]. Therefore, it can be said that academic success requires good usage of study skills. On the other hand, students with low academic achievement generally exhibit ineffective study skills and they accept a passive role which shows dependency on teachers or parents [16]. Furthermore, Gettinger and Seibert [16] also explained features of studying in their literature review study. Two of these features are that studying requires skills and practical training to help learners how to get, organize, process and use information. Secondly, studying is volitional activity which needs special time and effort by learners.

Much research shows the importance of study skills in academic success. For instance; in their meta-analysis, Crede and Kuncel [13] found that study habits and skills foresee academic performance more than any other affective individual difference variable investigated until now and could be regarded as the third pillar of academic success. Robbins et al. [15] presented an influential meta-analysis in *Psychological Bulletin* examining the incremental contribution of what they called psychosocial and study skills factors (PSFs) to the prediction of academic success. One of these factors are academic-related skill factors, which include study skills and habits. The results of this meta-analysis showed moderate relationship between academic success and academic-related skills ($r = .366$). Literature foresees that academic achievement comes when academic learning skills are acquired. Although some of the literature supports the idea of teaching study skills before starting to academic program, other supports the idea that first year of the university is a critical time for the student engagement and study skills can be boosted at the beginning of the university [17].

Besides prime importance of teaching study skills to the students regardless of before or during academic program, teaching approaches also deserves attention. Integrating study skills in separate courses or seminars has been changed to integrating it into subject courses because the terms knowledge and subject content have close interrelation. The instructors can teach students the 'skills of learning' or 'learning to learn' approach by embedding these skills' instruction methods within their subject matter courses [18]. In his meta-analysis, Hattie [19] proposed that courses in study skills alone can be effective on a surface level of understanding but combining study skills course with a content to have far better influence on learners' a deeper level of understanding. In their review article from 51 intervention studies on study skills, Hattie et al. [20] also supported the idea of training study skills within a context and using task-related activities to develop learner activity and their metacognitive awareness. In this sense, training study skills in metacognitive level requires metacognitive intervention courses. Differently from cognitive interventions which focus on task-related skills such as note-taking or summarizing, metacognitive interventions focus on self-management of learning when, where, why and how to use specific strategies in appropriate contexts [20].

We would like to find out that when these study skills, either in cognitive or metacognitive level, implemented into instruction courses before entering to university, the students' learning becomes more direct and effective by using these skills. In the next section, we explain the methodology of this literature review study and subsequently the results that we had.

3 Method

For this study, we adopted literature searching approaches following the guidelines of [21]. Back and forward searching methods as suggested by [22] were also utilized. We used the database EBSCOhost, especially the psychology and educational databases PsycARTICLES, Education Resource, ERIC, and SocINDEX with the option

‘scholarly peer-reviewed academic journals’. Additionally, the IEEE Xplore database and Google Scholar were included. In a first search, we used the following keywords: *study skills* or *study habits* or *learning habits* and *dropout* or *drop out* or *drop-out*. Doing so, we received 407 hits. Next, we limited the results to publications related to preschool age (2–5 years), school age (6 to 12 years), or adolescence (13–17 years) and the number of the relevant articles for our study dropped to 165. We screened the titles and abstracts of these publications looking for their study designs and their relevancy to our search criteria of university dropouts. In this way, we reduced the amount of relevant publications to 8. Most of the eliminated publications are related to open and online education, high school dropouts, and behavioral problems of students. However, the article found during back and forward searches was also included in this study, following Webster and Watson’s advice about writing a literature review [22]. Thus, we finally analyzed 9 publications.

Our database research showed that although the relevant literature selection criteria were set within the ages of K-12 students, the results include university students and university preparatory year students. Besides, our results were restricted to accessible full-text articles provided by our institutional library

4 Results

Because this study only investigated contributions to the relationship between study skills and dropout from university, only a small number of relevant publications could be found. E.g., only three studies [9, 23, 24] focused on successful student transition from high school to university. Showing that this specific subject has so far not been researched extensively. Additionally, none of the publications provide a holistic view of the subject matter. Thus, our model showed in Fig. 2, provides tentative first results.

Next, we present brief summaries of the relevant publications, followed by a first version of our model showing the relationships between study skills, dropout rate, and some influencers. Finally, this chapter describes the individual components of the model.

4.1 Summary of the Relevant Literature

A study by Lowe and Cook [23] explored high school students’ transition to the university. In this study, a single group of students was surveyed both before entering to university as well as two months after starting their studies. The results revealed that at the end of the first two months, 22% of the students had experienced lacked study skills they expected to have in the pre-test. Furthermore, this study evaluated how much ‘extended support’ students need for the development of academic skills in nine study skills areas. The results revealed that students require more support from academic staff in formal lecture, presentation, academic writing, IT, and time-management skills. Hence, the authors concluded that students experiencing academic difficulties are more prone to dropping-out of their studies.

Creating a learning atmosphere in which students learn and practice their study skills can inspire them for better study and successful completion of their programs

in the future. Therefore, integrating study skills courses with subject content, as we mentioned in the second section of this study, can be a good approach. To give an example, in recent research, a study skills course was integrated into an interactive educational game. The SAP ERP simulation game, ERPsim is an enterprise game which helps to strengthen 11th graders study skills. The participating students visited a university in Germany; the focused skills were time management and teamwork. They collaborated with university students during the game while being informed about studying at a university by these senior students. The main aim of this study was to support students' smooth transition to university. Although it was only a one-day training, it significantly increased in pupils' awareness about university as well as their time management and teamwork skills [9].

Another example of embedding technology with study skills is the program 'Study-MATE' [25]. This project was implemented by a university's study support services aiming to inform 'at risk students' who are adjusting to the university and to boost their awareness of the student learning services. The participants received informative study skills hints and tips via their student e-mail account and via SMS. The results revealed that this program increased the students' awareness about study skills and supported their habitual study throughout semester. However, only 30% of the participants agreed that this program increased their planning and preparation for exams and assignments [25].

More than 1,000 freshmen attended 10 h of metacognitive-skills courses which aimed to improve their study skills, study habits, and self-knowledge necessary to succeed at university. The course sessions were guided by teachers, educational counselors, and psychologists. The aim was to increase these competencies to reduce failure rates (dropouts). The results demonstrated that the course improved the students' perceived ability to use the study strategies significantly [26].

A study by Loyens et al. [27] measured students' conception of constructivism at the beginning and end of the academic year. The students' learning activities, self-study times, and cooperative learning activities were observed and rated by tutors. One of the results of this study was that when students have higher conceptions of learning, they cooperated with fellow classmates. Another finding was that when students spare more time to studying, they were more likely to complete their degree.

Another alternative to support students' teamwork skills would be learning communities. A pilot study by Cuevas et al. [28] split first year university students into two groups: learning community and non-learning community. The aim was to gather students in the learning community to discuss the subject contents, to cooperate during studying, and to meet outside the classroom for preparation of exams. The instructor guided and engaged students for discussions and for learning activities. Therefore, these meetings let them study together regularly and they broke last-minute studying habits for exams. At the end of the pilot study, the differences between groups were significant. The learning community received higher grades and improved both their time management and teamwork study skills.

A study by Wernersbach et al. [29] focused on teaching academically underprepared students the following study skills: note taking, time management, learning strategies, and test preparation skills. These study skill courses were introduced by instructors

during seven weekly sessions. At the end of the course, a post-test survey was sent to the participants. Academically underprepared students improved their study skills significantly more than the control group. This highlights the importance of identifying these students in the early stages of their formal education.

A case study [30] focused on teaching academic literacy skills such as essay writing, complex problem solving, and active reading to preparatory school students. The successful students were awarded admission to the bachelors' program. However, students coming from poorly-resourced schools couldn't get admission to the program.

Our backward research resulted in one study, which aimed to prepare school students for the university life as well as to strengthen their study skills for smooth transitions to university. The Pupil's Academy of Serious Gaming project focused on improving time management, communication and presentation skills, and problem solving strategies of 11th graders. The participant students were invited to play a business game in teams, helping them to develop their cooperation skills. The results displayed positive perspectives of students after attending Pupil's Academy. Most of them stated that they now have a clear idea what studying really means. Beyond these results, this study compared participant students' and the control group's final examination (the German 'Abitur') results, and found that participants students achieved lower failure rate than control group [24].

4.2 Development of a Model

By analyzing the aforementioned publications, we were able to develop a preliminary model showing the relationship between the study skills, their influencers, and the dropout rate, in line with our research model shown in Fig. 1. Furthermore, in her study, Wingate [8] integrated each study skill into the QCA key skills framework [31]. This framework inspired us to categorize our identified study skills into these five categories. Overall, we identified *support services*, *university students*, *instructors*, *counselors*, *psychologists*, and *teachers* as influencers. We also identified twelve study skills affecting the dropout rate at university and grouped them into the following categories: *communication*, *working with others*, *problem solving*, *self-learning and evaluation*, and *information technology numeracy*. Figure 2 illustrates our preliminary model showing the relationship between the study skills, their influencers, and the dropout rate from university.

However, due to few relevant publications we assume that this model is incomplete. It must be borne in mind that on the one hand, additional study skills could influence dropout rate at university, and on the other hand, additional influencers or additional relations between the known influencers and the study skills must be considered. In the next section, we define our findings of study skills under the five skill categories followed by a section defining the six identified influencers and their relations to the study skills.

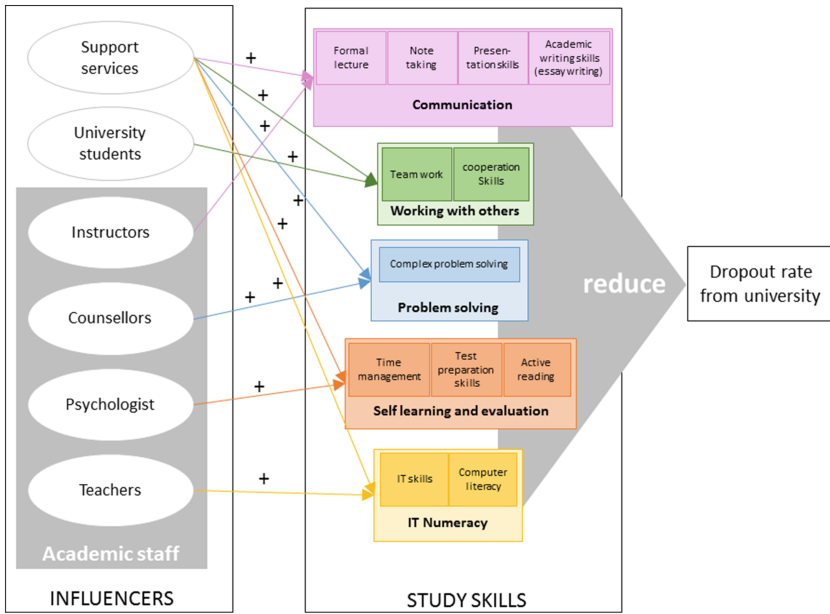


Fig. 2. Model showing the relationship between the study skills, their influencers, and the dropout rate from university (own illustration)

4.2.1 Study Skill Categories and Study Skills

Communication [23, 24, 29] is one of the study skills categories and includes *formal lecture* [23], *note taking* [29], *presentation skills* [23, 24], and *academic writing skills* [23]. Communication skills are vital both in speaking and in writing to convey own thoughts, to present and analyze complex information, as well as, in listening, comprehending and responding to others [32]. In this sense, formal lecture and note taking are important skills for students’ success, because taking good lecture notes means achieving in recording information from professors’ lectures [33]. In oral communication, presentation skills keep a prominent importance as it addresses all audience. Participant students improved their presentation skills as a team in a business game in which they presented the business activities of their companies [24]. However, students might feel necessity of extra support in certain communication skills branches. For instance, in the study of Lowe and Cook [23] the participating students expressed that they require more support in giving a verbal presentation to other students and writing a practical report.

The working with others skill [9, 24, 28] encompasses *teamwork* and *cooperation*. Cooperative working requires students to use interpersonal skills appropriately, valuing others’ contribution, but at the same time taking responsibilities for their own mission and aims [32]. Students with good teamwork skills should be able to enjoy working with other group members on a same mission, ready to take responsibilities, and feel comfortable with presentations in front of a group [9]. Therefore, the difference between teamwork and cooperation is that teamwork requires group members to work on a common

task altogether, however in cooperation, each group member has their own tasks but works collaboratively both to improve their skill set and the other group members'.

The problem solving skill [24, 30] has three stages and it resolves issues or problems in personal, social, and work contexts. The first stage is critical thinking in which students use reasoning skills to make the best decision, then comes planning resources and managing tasks to completion, and the last stage is reflecting on outcomes of the tasks [32].

The self-learning and evaluation [9, 29, 30] skill includes the skills of *time-management* [9, 24, 29], *test preparation* [29], and *active reading* [30]. These skills focus on individual tasks. For instance, students with good *time management skills* can organize their time efficiently, complete their tasks on schedule without delay, prioritize tasks, and make responsible decisions [9]. By creating learning communities, Cuevas et al. [28] focused on teaching group of students the *test preparation skills* for their biology exam. The results showed learning community scored higher in every test than the non-learning community. Active reading and reading comprehension are crucial study skills as science students needs extensive academic vocabulary and complex language skills to understand the script [30].

The IT numeracy skill covers *information management* and *computer literacy*. These skills enable students to search for the most appropriate sources of information in the library or on the internet [23]. Students can also perform more complex tasks i.e. using Microsoft Excel to deepen their practical knowledge in statistics [9].

4.2.2 Influencers' Roles in Improving Study Skills

Through our analysis, we identified six influencers who have direct impact on students gaining, improving, and strengthening skills. All the analyzed publications deal solely with positive effects of the influencers on the study skills.

Support services [25] play an effective key role for new students' integration and offer a wide range of induction courses such as study skills courses to increase students' awareness of learning services. In the study of Jayde et al. [25] support services took the active role of informing the first year students with the available skills courses. Furthermore, they built up the Study-MATE messaging system to give study tips and clues to students. One of the messages aiming to give tips about success examples is: "*Message Week 6 - So glad da break is here! Was starting 2 stress:0 Latest tips for success are here <http://tiny.cc/StudyMATE> or BBoard Study-MATE*". The result of this study shows that the support services' action in creating such interactive services increased students' awareness of the study skills courses.

University students [9] might be efficient influencers and role models for the school students in many ways. In the study of Utesch et al. [9], school students visited a university where they played a simulation game and explored the university atmosphere. The university students took an active role of mentoring these students and answered their inquisitive questions, thus giving them insight into university life. The outcomes of this study were positive, as university students' companionship helped school students to break barriers and to develop an idea of being a university student. Furthermore, with the simulation game, they strengthened their time management and teamwork skills [9].

Academic staff [26, 28, 29] includes *instructors, counsellors, psychologists, and teachers*. In their study, instructors took an active role of teaching study skills to the underprepared students during seven sections of the course [29]. First forming a learning group, then engaging them with discussions and test preparation strategies, instructors performed well by proving the significant results between learning and non-learning community students [28]. School counselors take active and direct roles of designing structured lessons and providing students the knowledge and skills, which are fitting for their developmental level [34]. In a school environment, counselors, psychologists and teachers work collaboratively to improve academic achievement. School psychologists give direct support and interventions to students and consult with teachers, families and school counselors to improve the academic achievement of students as well as their engagement and learning [35].

5 Conclusion and Outlook

As we mentioned in Sect. 1 of this paper, a higher university enrolment rate does not always result in a proportional number of graduates from these universities. One of the ways preventing university dropouts is to prepare current K-12 students for their future academic life by practicing study skills. Therefore, this study aimed to look for academic publications which address this issue. Our database research resulted in nine publications which showed some relation between K-12 students' study skills and their influences on the future university dropout probabilities. Despite the number of these studies, their findings shaped our preliminary model of the relationships between influencers, study skills, and dropouts. Identifying underprepared students early and providing them with relevant study skills before entering university are the key points to reduce the probability of university dropouts.

However, the presented model was developed based on nine publications, and we must conclude that this model is incomplete. It must be borne in mind that, on the one hand, additional study skills could influence dropout rates at university and, on the other hand, additional influencers or additional relations between the known influencers and the study skills must be considered. There is therefore a need for further research to complete and to validate the model.

With this study, we aim to increase awareness in families, teachers, and universities. Thus, more students will hopefully achieve education as a successful transition to their working lives. Additionally, families, teachers, and universities reap the rewards of the time, effort, and money they have invested in students' success.

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