

PAPER • OPEN ACCESS

## Analysis of factors affecting thesis work of physics students in digital era

To cite this article: Yoza Fendriani and Zakirman 2020 *J. Phys.: Conf. Ser.* **1481** 012090

View the [article online](#) for updates and enhancements.

### You may also like

- [Use of model analysis to analyse Thai students' attitudes and approaches to physics problem solving](#)  
S Rakkapao and S Prasitpong
- [Students' common difficulties and approaches while solving conceptual problems with non-identical light bulbs in series and parallel](#)  
Jing Li and Chandrekha Singh
- [Understanding and Awareness of Undergraduate Physics Student in Earthquake Phenomena in Indonesia: A Response of a Series Earthquakes on July 5-7, 2020 in Java](#)  
U A Deta, C P Nugraha, N A Lestari et al.



**ECS**  
The  
Electrochemical  
Society  
Advancing solid state &  
electrochemical science & technology

**DISCOVER**  
how sustainability  
intersects with  
electrochemistry & solid  
state science research

# Analysis of factors affecting thesis work of physics students in digital era

Yoza Fendriani<sup>1\*</sup> and Zakirman<sup>2</sup>

<sup>1</sup>Department of Physics, Faculty of Science and Technology, Universitas Jambi, Indonesia

<sup>2</sup>Department of Education Science, Faculty of Post Graduate, Universitas Negeri Padang, Indonesia

\*yozafendriani@gmail.com

**Abstract.** Thesis is one of the mandatory requirements to complete education at the university level. The conditions in that process indicate that many factors influence the completion of student thesis, especially in the Physics department. Physics students are currently in the digital age, so the rapid development of technology contributes to the completion of thesis. The purpose of this study is to describe the results of the analysis of factors that influence the successful completion of thesis Physics students in the digital era. This type of research is descriptive, with samples 35 Physics students covering undergraduate, master and doctoral level. Based on the results of this study, it was found that there are several factors that influence the success of student thesis in the digital era, namely: internet browsing preferences, quality of guidance, desire to graduate on time, want to boast of parents, ability to write articles, pressure from family, motivation from friends, availability of references on campus, availability laboratory tools, campus internet access, using of chat applications on smartphones, internet network quality, intensity of attending peer sessions and proficiency in technology.

## 1. Introduction

Education at the university level is the highest level of education pursued by students after completing their education from high school. The academic degree, obtained by every student who completes his education at the university, is one of the distinguishing features of education from high school. To achieve an academic degree, every student has an obligation to complete the final project and do a research that contributes to each field of expertise of students [1]. Completion of the final project is also one indicator of the achievement of accreditation of an institution both department or university accreditation.

Before completing their study program in a particular field of study, each student needs to write a scientific paper in a thesis form. Student as an academic will be considered to contribute to science when they write a thesis [2]. Thesis compiled and written refers to the results of existing research, scientific ethics and must be highly readable — that is, clear, accurate, and concise. A good thesis must have a level of originality or new findings so that it can enrich science [3]. When students have been able to write a thesis and are able to be accounted for in scientific examinations by a team of examiners who are experts in their fields, of course this shows that the student is competent in his scientific field. His studies in certain fields of study can be declared completed and formally tested.



Thesis is a work that is most easily studied by everyone [4]. Practicality reason in the dissemination of science is also become a consideration that a thesis needs to be produced. Thesis is the embodiment of student academic quality. With a thesis, students learn to think critically and write systematically. This ability is important in the next level of life. On a larger scale, the better the quality of the thesis created means that more knowledge is absorbed.

Every student who studies at college level must complete a thesis, including physics department. Various papers with many topics can be chosen by physics students to be used as research material. The topic of the thesis is quite varied, starting from the study of education in the field of physics like methods, strategies, or teaching materials [5] as well as research in the fields of instrumentation, computing, geophysics, material physics, and medical physics. Thesis work can become a forum for students as beginner researchers to develop insights and knowledge in research. Current factors reveal that the current direction of student research is strongly influenced by technological devices.

Technology and students for now is an unity [6]. Almost all students every day carry out activities with technology. The role of technology is also seen in the organization of academic activities [7]. Technology applications will be very meaningful for students when observing the role of smartphones in supporting academic activity. A survey that was conducted showed that almost 98% of students currently have smartphones and use it in activities that support academic activities.

Life in this era is completely digital and reduces boundaries between space and time [8]. The researcher wants to know whether the impact of the digital era will also contribute to the research needs and completion of students' thesis, especially physics students. This research will be a comparison between the needs of completing thesis of physics students at the undergraduate, master and doctoral levels compared to the needs of students with the same level of education in the last few decades.

## 2. Literature Review

The college education system applies the requirements that must be taken by a student to end his studies at the educational level and obtain an academic degree by completing a thesis [9]. Thesis writing is for sharing student's research work with other scientists or for reviewing the research conducted by others. The completed thesis will be tested and presented to the expert lecturer so that the reliability of the research report can be justified. The thesis is useful as a basic for assessing students' analytical skills in applying knowledge that they have gained during lectures in accordance with their respective majors. Before students take a thesis, there are several conditions that must be taken, such as completing all courses with a total weighted "semester credit unit" that have been determined, have passed certain courses as a basis for expertise or have attended the course of the proposal seminar process and other requirements which all are aims to enable students to understand the process that must be undertaken to complete the research results.

Students who are able to write thesis are considered able to combine their knowledge and skills in understanding, analyzing, describing, and explaining problems related to their scientific fields. Thesis is a scientific paper based on the results of research and study of literature compiled by students in accordance with their major of study as the final project in formal studies at higher education [10]. Thesis in education sector means a result of the preparation of scientific writings that have been verified based on data that has been collected. The data that has been collected is then processed to become valid data as a reference for proving the truth of the writing.

In writing the thesis, students are guided by one or two supervisors who are lecturers at the college where students study. The process of preparing a thesis varies from one campus to another. But generally, the thesis preparation process is as follows:

- 1) Submission of a thesis title
- 2) Thesis proposal seminar
- 3) After writing is considered ready and complete, students present the results of the thesis to the examiner lecturer.
- 4) Students whose thesis examination results are accepted by revision carry out the revision process according to the examiner's input [11].

Thesis has characteristics that must be possessed, including: thesis is a scientific work that must be produced through scientific methods, a written report of research results on one aspect of community or organizational life (for social sciences). The results of this study are reviewed by referring to a phenomenon, theory, or relevant research results that have been done before [12].

In completing the thesis, students sometimes face obstacles and problems experienced by both external and internal factors, and those problems are very diverse and different [13]. The obstacles in working thesis makes the thesis process begins not running smoothly. Several factors that influence thesis work will be examined in this study. Some previous studies illustrate that there are several factors that influence the work of student's thesis, including: pressure from family, self-motivation, relationships with supervisors and the desire to graduate on time. If it is associated with the current phenomenon that education based on industrial revolution 4.0, student activities and academic activities are influenced by technology. The role of technology could facilitate student activities, especially in extracting information. This certainly provides benefits and advantages in accelerating the process of literature study and student research. The role of technology aspects need to be more specified so that the students' needs for technology are truly understood by related parties in order to facilitate the thesis completion process.

### **3. Research Method**

This research is quantitative descriptive type. It aims to reveal any factors affect the completion of student's thesis majoring in physics in various levels of education. The total sample in this study was 35 students, with the following details: 20 students in the undergraduate degrees, 10 students in magister degrees, and 5 students in doctoral degrees. The data collection instruments in this study were questionnaires arranged based on research needs and adapted from several journal literature so that the main factors that influence the completion of student's thesis majoring in physics. The data analysis technique used is a multivariate factor analysis technique aided by the SPSS application version 16. The conclusion of this study is obtained by looking at the interrelations between factors in the form of factors extracting each indicator.

### **4. Result and Discussion**

Thesis is one of the obligations of scientific work that must be written by every student in order to complete his education at a certain level at university. Success or failure of students' thesis can not be separated from the role of lecturer as a supervisor whose task is to direct and assist the implementation of research activities. Recently, thesis often identified with the quality of relationship between students and lecturers. Completion of the thesis can be a medium of communication and dissemination of scientific information between students and lecturers. Thesis is often used as a reason for students who are constrained in completing their studies.

Based on preliminary analysis and literature study, it was concluded that there are 12 underlying factors that the success of students in completing thesis from undergraduate, master or doctoral degrees. Those factors including: quality of guidance (from supervisor), desire to graduate on time, want to boast of parents, ability to write articles, pressure from family, motivation from friends, availability of references on college, availability of laboratory equipment's, intensity of attending friend proposal seminars. The role of technology cannot be denied has influenced the completion of student thesis, the new factors include: internet browsing preferences, internet access on campus, using of chat applications on smartphones, internet network quality, and proficiency in technology. The whole factors which have been conclude from analysis study and literature study are then formed as statements and presented in the questionnaire. The questionnaire that was designed are then given to 35 respondents of physics students with the following details: 20 undergraduate students, 10 magister students and 5 doctoral students. The results of the questionnaire were processed by multivariate factor analysis testing using SPSS version 16.

**Table 1.** Factors Analysis Results in 1<sup>st</sup>stage

No	Variables	Value
1	Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.603
2	Approx. Chi-Square	177.780
3	Df	105
4	Sig.	0.000

Based on analysis results at the first stage, the criteria for pressure from families factors do not meet the multivariate test requirements so that this factor eliminated from all the factors to be tested. With this analysis result, it can be concluded that the pressure from the family is not part of the main factors that influence the completion of students' thesis majoring in physics both in the undergraduate, master and doctoral degrees.

**Table 2.** Overall Factor Analysis Results in 2<sup>nd</sup>stage

No	Variables	Value
1	Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.666
2	Approx. Chi-Square	161.021
3	Df	91
4	Sig.	0.000

Based on analysis results of the second phase, the factor of close friend's motivation did not meet the multivariate test requirements so the factor was excluded from the whole factors to be tested. This means that the motivation of close friends has not had enough effects and influence in making it easier for physics students to complete their thesis. Then researcher do a retest is to see if there are other factors that have not contributed to the thesis completion of physics students. The test was continued using KMO and Bartlett used factors that were still available. The results of the analysis presented in Table 3.

**Table 3.** Overall Factor Analysis Results in 3<sup>rd</sup> stage

No	Variables	Value
1	Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.676
2	Approx. Chi-Square	149.083
3	Df	78
4	Sig.	0.000

From analysis results of the third stage, the ability to write articles criteria is also do not meet the multivariate test requirements so that this factor is excluded from the overall factors to be tested. The ability to write good articles does not have a significant impact on the completion of the thesis of physics students. The results of the data analysis after removing the writing ability factor can be observed in Table 4.

**Table 4.** Overall Factor Analysis Results in 4<sup>th</sup>stage

No	Variables	Value
1	Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.692
2	Approx. Chi-Square	138.192
3	Df	66
4	Sig.	0.000

After the fourth stage of the test, all factors have met the requirements so that the factor analysis test can proceed to the next stage.

**Table 5.** Total Variance Explained

<b>Total Variance Explained</b>						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.770	31.413	31.413	3.770	31.413	31.413
2	1.885	15.711	47.124	1.885	15.711	47.124
3	1.380	11.498	58.621	1.380	11.498	58.621
4	1.244	10.365	68.987	1.244	10.365	68.987
5	.881	7.344	76.330			
6	.748	6.231	82.562			
7	.557	4.644	87.206			
8	.426	3.551	90.757			
9	.354	2.951	93.708			
10	.307	2.560	96.267			
11	.252	2.103	98.370			
12	.196	1.630	100.00			

In the table above it appears that eigen values change from 3,770 to gradually decline. If the eigenvalue number is still more than 1, then the factor formed is not optimal. Changes in the eigenvalue from initially more than 1 eventually to less than 1 occur at the transition of the number of factors (components) from 3 to 4. So it can be interpreted that, ideal number of factors for this case are 3 factors. Furthermore, to determine which items go into which factors, can be seen from Table 6.

**Table 6.** Component Matrix

Variables	Component			
	1	2	3	4
Quality of Guidance from Supervisor	-0.347	0.100	0.056	0.807
Desire to Graduate On Time	-0.482	0.023	0.280	-0.572
Want to Boast of Parents	0.333	-0.378	0.417	0.306
Internet Browsing Preferences	0.731	0.124	0.415	0.059
Availability of References on College	0.112	0.767	-0.061	-0.033
Availability of Laboratory Tools	0.165	0.832	-0.073	0.146
Campus Internet Access	0.659	-0.393	-0.330	0.263
Using of Chat Applications	0.689	-0.062	-0.526	-0.215
Internet Network Quality	0.736	-0.299	-0.171	-0.136
Smartphone Sophistication	0.754	0.237	-0.020	-0.020
Attend Peer Sessions	0.526	-0.066	0.718	-0.106
Proficiency in Technology	0.660	0.356	0.110	-0.023

After data analysis, 4 extraction factors were obtained, namely:

1. Factor 1: Quality of guidance (Process)
2. Factor 2: Desire to graduate on time, want to boast of parents, attend peer sessions (awareness in students)

3. Factor 3: Internet browsing preferences, campus internet access, chat applications, internet network quality, smartphone sophistication, proficiency technological (technology requirements)
4. Factor 4: Availability of references on college, availability of labor tools (Campus Facilities and Infrastructure)

In this research, new factors emerge that influence the completion of students' thesis either from the undergraduate, magister, and doctoral program. Technology is a factor that plays an important role in the completion of the thesis of physics students. In the year before the rapid development of the digital world, the research and students' thesis were influenced by internal factors such as self-motivation and the availability of facilities and infrastructure [14, 15, 16]. Technology has a major contribution in the completion of the physics student thesis. Technology contributions can be observed from the ease of accessing the latest journals and can be obtained by students in just seconds. Freedom to access to information whether it is a journal or current issues of research topics is facilitated by access to the internet network available on campus, the sophistication of smartphones and also scientific discussion groups that can be easily entered by students. Chat groups such as telegram and WhatsApp contributed to the student success in getting information relevant to research. The existence of these online-based groups also broadens the communication network between students and experts or other students who are experienced in their fields.

Fluency in communication within the student group is inseparable from the quality of the internet network available either on campus or neighbourhood. Students who live in environments with poor internet quality are proven to have fewer digital materials and references compared to other students whose neighbourhoods have very good internet quality. Internet quality network can be the main focus and attention so it can be said as a moderator variable that influences the fluency of students in completing a thesis.

In the future, it is expected that the colleges and related officials pay more attention to the internet network quality in campus and even if possible the environment around the campus where students live can access the internet network. The quality of the internet network and the availability of wi-fi on campus is a mandatory requirement that must be fulfilled in order to facilitate students accessing information and journals related to their research being worked on. Internet and technology networks are a necessity that is fulfilled by every campus so that students who are working on their thesis can be helped and can complete their thesis well

## 5. Conclusion

Thesis is one of the mandatory tasks that physics students need to complete before getting an academic degree at the undergraduate, magister or doctoral degrees. Based on the results of data analysis and research discussion, in the digital era it can be concluded that the completion of physics students' thesis is influenced by 4 main factors, namely: (1) *Process*, (2) *Student self-awareness*, (3) *Technological needs* and (4) *Facilities and infrastructure on colleges*. The results of this study complement the results of previous studies which stated that the completion of a student's thesis is influenced by self motivation. In the future, it is hoped that policy makers will pay attention to the need for technology to support students' success in completing the thesis. It cannot be denied that nowadays everyone (especially students) has a strong dependence on technology

## References

- [1] Dwi Yulian, H. (2017). Studi Fenomenologi: Kecemasan Mahasiswa dalam Menyelesaikan Penulisan Skripsi Jurusan Bimbingan dan Konseling. *Fakultas Keguruan Dan Ilmu Pendidikan Universitas Nusantara PGRI Kediri*, 1-12.
- [2] Hartanto, Ujang & Mimin Nur. (2015). Faktor-Faktor Yang Mempengaruhi Penyelesaian Skripsi Mahasiswa Pendidikan Akuntansi Universitas Negeri Yogyakarta. *Prosiding Seminar Nasional: Penguatan Hubungan antara Pengembangan Keterampilan, Pendidikan, dan Ketenagakerjaan Generasi Muda*, 131-139.

- [3] Prima Setiawan, H., & Syarifah Faradina. (2018). Perfeksionisme dengan Prokrastinasi Akademik dalam Menyelesaikan Skripsi pada Mahasiswa Universitas Syiah Kuala. *Jurnal Psikologi Unsyiah*, 1(2), 20-36.
- [4] Hadiono, Ade. (2016). Analisis Faktor Penghambat Penyelesaian Skripsi Mahasiswa STIA Banten. *Jurnal LPPM STIA Banten*, 165-174.
- [5] Zakirman, Z., Lufri, L., & Khairani, K. (2019). Factors Influencing the Use of Lecture Methods in Learning Activities: Teacher Perspective. In International Conference on Islamic Education (ICoIE 2018). Atlantis Press.
- [6] Zakirman, Z., & Rahayu, C. (2018). Popularitas WhatsApp sebagai media komunikasi dan berbagi informasi akademik mahasiswa. *Shaut Al-Maktabah: Jurnal Perpustakaan, Arsip dan Dokumentasi*, 10(1), 27-38.
- [7] Zakirman, Z. Z. (2017). Pengelompokan Gaya Belajar Mahasiswa Menurut Teori Honey Mumford Berdasarkan Intensitas Kunjungan Pustaka. *Ristekdik: Jurnal Bimbingan dan Konseling*, 2(2).
- [8] Anealka, Aziz Hussin. (2018). Education 4.0 Made Simple: Ideas For Teaching. *International Journal of Education & Literacy Studies*, 6 (3), 92-98. <http://dx.doi.org/10.7575/aiac.ijels.v.6n.3p.92>.
- [9] Pramusinto, Hengki, H., Indri Murniawaty & Prasetyo Ari Bowo. (2017). Evaluasi Program On-time Graduation Jurusan Pendidikan Ekonomi Universitas Negeri Semarang. *Jurnal Pendidikan Ekonomi UM Metro*, 5(2), 27-33.
- [10] Nur Aslinawati, E., & Sri Umi Mintarti. (2017). Keterlambatan Penyelesaian Skripsi Mahasiswa Angkatan 2012 (Studi Kasus di Jurusan Ekonomi Pembangunan Fakultas Ekonomi Universitas Negeri Malang). *Jurnal Pendidikan Ekonomi*, 10(1), 23-33. DOI: <https://dx.doi.org/10.17977/UM014v10i12017p023>
- [11] Sitompul, H., Rosnelli, Eka Daryanto, Nathanael Sitanggang, & Dadang Mulyana. (2018). Kualitas Dosen dalam Pembimbingan Skripsi Mahasiswa Fakultas Teknik Universitas Negeri Medan. *Jurnal Pendidikan Ekonomi*, 20(1), 23-29.
- [12] Hariyadi, S., Abdul Haris Fitri Anto & Woro Apriliana Sari. (2017). Identifikasi Faktor-Faktor yang Mempengaruhi Penyelesaian Skripsi pada Mahasiswa S1 Psikologi di Kota Semarang. *Jurnal Penelitian Pendidikan*, 34(2), 155-160.
- [13] Xander Natas, M., Harlin & Imam Syofii. (2016). Analisis Kesulitan Penyelesaian Tugas Akhir Skripsi pada Mahasiswa Program Studi Pendidikan Teknik Mesin Universitas Sriwijaya. *Jurnal Pendidikan Teknik Mesin*, 3(1), 24-28.
- [14] Agung Nugroho, S. (2017). Hubungan antara Motivasi dengan Ketepatan Penyelesaian Tugas Akhir pada Mahasiswa Universitas Muhammadiyah Surakarta. *Jurnal Keperawatan Universitas Muhammadiyah Surakarta*, 1-13.
- [15] Eka Cahyani, Y., & Sari Zakiah Akmal. (2017). Peranan Spiritualitas terhadap Resiliensi pada Mahasiswa yang Sedang Mengerjakan Skripsi. *Jurnal Psikoislamedia*, 2(1), 32-41.
- [16] Wiyatmo, Yusman., Mundilarto, Suharyanto & Eko Widodo. (2010). Efektivitas Bimbingan Tugas Akhir Skripsi (Tas) Mahasiswa Jurusan Pendidikan Fisika FMIPA UNY. *Prosiding Seminar Nasional Penelitian, Pendidikan dan Penerapan MIPA*, 405-414.