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Understanding the barriers and facilitators of Students' Individual Performance

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Dissertation

presented as partial requirement for obtaining the Master Degree Program in Information Management

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação

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UNDERSTANDING THE BARRIERS AND FACILITATORS OF STUDENTS' INDIVIDUAL PERFORMANCE

By

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A master thesis is a personal accomplishment since it is a process that requires months to undertake and needs resilience, a spirit of sacrifice, and the strength to endure. Thus, I am overjoyed to have completed this milestone. Although it seems to be an individual work, it would not be possible to get "this far" without the contribution of several people.

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ABSTRACT

As societies develop, higher education plays an increasingly important role in promoting lifelong learning opportunities. Despite this, everyone involved in higher education faces new challenges due to the constantly changing global environment. Therefore, it has never been more important to identify the factors that are essential to students' academic success. An online questionnaire with 164 responses was used to empirically validate a conceptual model that was developed. The PLS-SEM approach was used to analyse the results, and findings suggest that students from various backgrounds still exhibit differences and gaps in their academic performance. Additionally, we can illustrate that when properly implemented, adjusted and updated learning techniques combined with practical classes are an effective tool to help students to achieve better outcomes. Academic achievement will be hampered, however, if a school lacks adequate funding and the top management and other education stakeholders do not share the same values. Finally, we can conclude that the school's facilities can contribute to improving student motivation and engagement and consequently positively impact the student performance.

KEYWORDS

Student performance; barriers; facilitators; education; prediction

Sustainable Development Goals (SGD):



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1. INTRODUCTION

An ongoing challenge that affects not just schools, professors, and students but the entire society as a whole, is determining the factors that are key to students' academic success (N. Ali et al., 2009; Jayanthi et al., 2014). For a long time, academics have sought to understand the impact that academic performance has on both people and society, mainly due to the benefits that have been demonstrated and emphasized regarding important societal aspects, including development and increased productivity (Neamtu and Neamtu, 2015; Spinath, 2012). Earlier research focuses on at least three processes through which education might influence economic growth.

- First, human capital - investing in society's human capital has been a major component of most countries' economic development programs. Accordingly, higher rates of academic success highlight the value of human capital (Lee and Barro, 2001), since Individuals with higher levels of education are more productive and adaptive to technological developments in their economy.
- Second, education promotes innovation by enhancing knowledge about new technologies, products, and processes.
- Third, education may boost economic growth by facilitating the spread and transfer of knowledge required to interpret and process new information (E. A. Hanushek and Woessmann, 2021).

Considering these important roles in society, students' academic success may indirectly influence a country's salaries, GDP (gross domestic product), and development rates (E. A. Hanushek and Woessmann, 2012), and act as a catalyst in efforts to oppose discrimination against minority groups and social exclusion (Dronkers, Van Der Velden, and Dunne, 2012). From a practical standpoint, a student's performance will likely also contribute to her/his decision to either continue to the next educational level or go into the world of work (Abosedo and Akintola, 2016).

Therefore, prior research has given much attention to measuring student achievement and its factors. However, it is a challenging topic in the academic literature because academic achievement still varies even when students have equivalent capabilities, study in the same environment, and experience the same curriculum (Muola, 2010). Moreover, these challenges are consistently associated with minority groups in the literature. However, without underestimating these problems, it should not be assumed that two students, A and B, making exactly the same effort in a course will receive the same grades, even if neither belongs to a minority group. This is due to the fact that student academic performance is influenced by factors other than academic, such as social, psychological, economic, environmental, and personal issues (Driessen et al., 2005).

Previous research has largely focused on demographic or social correlates (gender, age, occupation, work experience, and marital status) of academic achievement. For instance, Muola (2010) studied the impact of the home environment, and Mims (2003) analysed implementation of authentic learning in the classroom and influence on student achievement. It has been rare for studies to address the combination of these demographic and social factors with those related to the school itself, such as the design of the program and methods used that might be relevant to influencing student achievement and success.

This study adds to the current body of knowledge on the facilitators that help students to achieve better individual performance, and their practical barriers. The results facilitate the understanding of the strategies that can be adopted to support students in achieving better results in the medium and long term and, as an outcome, positively impact the socioeconomic development. Accordingly, the study's findings are expected to help us better understand how to support educational leaders in the long term, maximize their contributions within education systems and higher education institutions, and support policy makers, in the context of a European country.

The study describes and categorizes these factors based on an in-depth review of the literature (Section 2), identifying barriers and drivers, and testing them with an online survey of individuals from Portugal's higher education sector (Section 3). In Section 4 we discuss the results in greater depth and draw theoretical and practical implications. Lastly, we summarize the results and analysis, the study's limitations, and offer recommendations for future work (Sections 5 and 6).

2. THEORETICAL BACKGROUND AND HYPOTHESES

2.1. STUDENT INDIVIDUAL PERFORMANCE

As mentioned, higher education plays a fundamental role in developing societies and promoting lifelong learning opportunities for all. Nevertheless, higher education today faces challenges due to the constantly changing global environment and the rise of the digital culture (Llevot-Calvet and Cavero, 2018). Notwithstanding, the main goal of educational institutions remains the same: the development and enhancement of students' individual performance. The topic has received a great deal of interest in the literature because of the impact that academic achievement can have in socioeconomic development of countries. Since it is a wide-open topic, two main questions arise: how can we define individual performance and how can we measure it?

Researchers have made progress in defining and extending the performance concept over the past years (Campbell et al., 1990). Additionally, progress has been made in defining the key processes and predictors linked to individual performance. The success requirements and concepts are evolving along with the ongoing changes that we are seeing in organizations today (Drake, 2001).

When conceptualizing performance, according to researchers, we must first distinguish between the behavioural action itself and the result/outcome of performance (Campbell et al., 1990; Sonnentag and Frese, 2005). The behavioural component refers to what an individual does while at work, but only actions that are pertinent to the organization's goals are considered: "Performance is what the organization hires one to do, and do well" (Campbell et al., 1990). Accordingly, Steinmayr et al. (2014) describe academic achievement as a measure of how far a student has progressed in academic performance and how well they have achieved specific learning outcomes. It is therefore important to view academic achievement as a multidimensional construct that encompasses several dimensions of learning. From a practical standpoint this means that academic achievement can be described as a cumulative function of one's current and previous experiences at home, and in the community and schools (Hanushek et al., 2005)

Conversely, from the standpoint of outcomes, performance does not depend on the action itself but rather on the judgmental and evaluative processes surrounding it (Sonnentag and Frese, 2005). Also, actions that will be considered to calculate performance are simply those which can be quantified and scaled (Campbell, 1993). Some examples of measured actions are individual student marks, test evaluations, and scores on national exams (Chowa et al., 2015).

2.2. BARRIERS AND FACILITATORS

The second phase is to bring together the literature's factors that have an impact on this variable. Following Morton (2012), we must take into account more than only the negative variables that interfere with performance (identified as barriers in this study), but also helpful elements that improve performance. Facilitators, a term used for the latter, are factors that could improve performance or someone's capacity to do their work as successfully as possible.

The academic performance of students has been the subject of several studies in recent years. For instance, Mushtaq and Khan (2012) divide the factors that impact students' performance into two

major groups: internal and external. The first includes inner classroom aspects such as the performance of the teacher, learning methods applied, material and learning facilities, and size and environment of the class. Outside classroom circumstances, such as financial difficulties and personal and home constraints are the second.

Our proposed model, shown in Figure 1, illustrates the hypothetical relationship between individual performance and the barriers and facilitators selected: home/family constraints, lack of top management and government support, learning in practice, program design, use of multiple and updated learning methods, and creating a work climate that is conducive to learning.

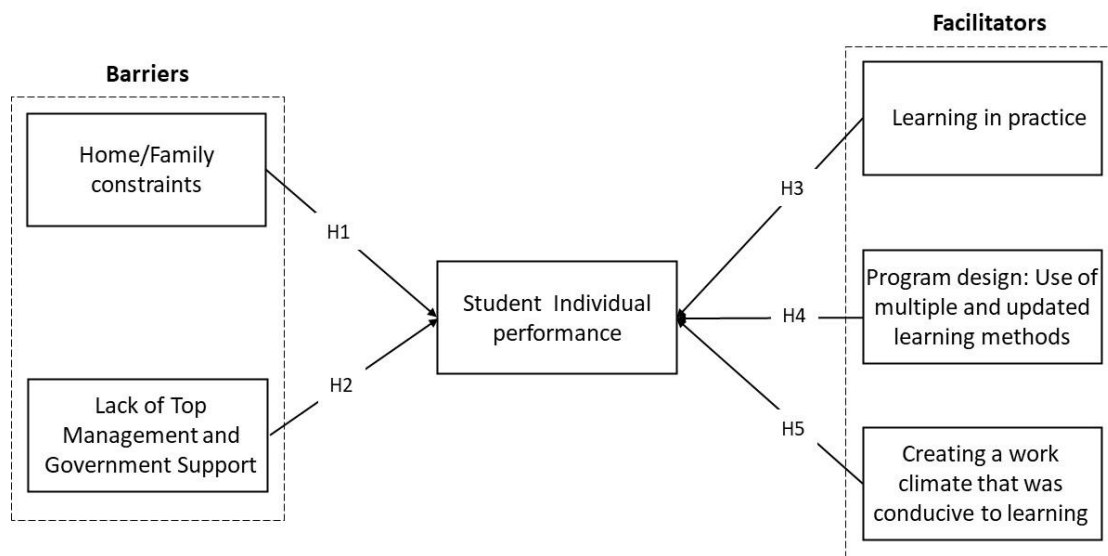


Figure 1: Research Model

2.2.1. Home/family constraints

Exploring the external factors, and regarding the home environment, Muola (2010) agrees with Mushtaq and Khan (2012), and states that a child's attitude toward school and motivation to achieve success in school could be affected by the value that families attach to education. It is important to recognize that the term "home environment" encompasses everything in the home that has a direct and indirect effect on a child physically, psychologically, intellectually, and socially. Many factors can contribute to the diversity of home environments, including parents' educational levels, economic conditions, religious backgrounds, and family size. Due to these, families are powerful influences on young children and are essential agents of socialization. Thus, the family climate could without doubt influence or hinder a child's academic performance. This theory is confirmed by several studies, such as Ali et al. (2013); Considine and Zappala (2002); and Gottfried et al., (1998) who also found that parent's social status and income influence student achievement and motivation. McDonald et al. (2001) concur, reporting that academic performance is correlated with the socioeconomic status (income, educational background, and professional background) of the parent. Based on that, we posit:

H1: Home/family constraints have a negative impact on student individual performance.

2.2.2. Lack of top management and government support

Another example of an external factor was pointed out by Senguo and Ilomo (2020), who investigate the effect of educational leadership on student outcomes, seeking to determine if there is a connection between school leadership and academic achievement. According to Jacobson (2011), for school management to be successful and improve learning, it should be a collaborative process in which teachers and stakeholders can participate in the process through the creation of relationships and networks rather than being confined to formally assigned responsibilities. When management techniques empower teachers and allow them to practice with greater autonomy in areas that they consider to be important, academic performance is more likely to increase. The quality of school management contributes to shaping the motivation of teachers and the quality of their teaching, which may then have an impact on students' performance.

Seashore et al. (2010) suggests that one of the most important factors impacting student progress is school leadership. According to them, teams responsible for managing and leading must have a full comprehensive awareness of their roles and their influences on all school interventions. Mutula (2009) agrees, but found other challenges including lack of learning facilities, excess bureaucracy in the processes, difficulties balancing work and academic life, diminishing and inadequate financial and government support, poor supervision, and poor student preparation.

Thomas and Bainbridge (2000) argue that school's basic curriculum can be learned by all children, referencing to Ronald R. Edmonds, known as the "Father of the Effective School Movement. They also argued that all children can learn provided that certain requirements are met, the first being that State legislatures provide adequate financial support for schools. Ali et al., (2013) confirmed that students who learn in school with more adequate facilities and better resources have a tendency to accomplish better results. This is confirmed by De Zoysa and Herath (2007) and Tambychik and Meerah (2010), who discovered that strategic management and the availability of funding impact academic performance, and that both lead directly to efficient management, highly motivated teachers, and access to resources, all of which are important factors in boosting student performance. Hence, we propose:

H2: Lack of top management and government support have a negative impact on student performance.

2.2.3. Learning in practice

Regarding internal classroom factors, Abrami et al. (2008) have stated that the link between teaching quality and student achievement is a promising research area that requires further investigation. Authentic learning in education is a method of instruction that provides teachers with the opportunity to bring the outside world into the class and allows students to explore, discuss, and meaningfully construct theories and connections, involving real-world challenges and projects that are important to them (Mims, 2003). In the mid-west of the United States, Newmann et al. (2001) conducted a three-year study and found strong evidence that students who are engaged in real classroom activities that seek to create rather than replicate knowledge, request organized exploration, and use tasks that are significant and useful outside of the classroom, perform better. It is well known that practical classes give students the opportunity to hone their practical, hands-on abilities, evaluate, interpret,

and analyse information, reinforce theories and concepts, take decisions, form opinions, and pique their curiosity. Given the fourth industrial revolution we are currently experiencing, it is imperative that students learn and train in these skills. According to Gregory and Di Trapani (2007), it is critical for students to be conceptually and procedurally prepared. We therefore propose:

H3: Learning in practice has a positive impact on student performance.

2.2.4. Program design: Use of multiple and updated learning methods

The curriculum used by a school is another prime concern that should also be taken into account when ensuring the academic success of students. The curriculum can have a substantial effect on how well students perform in class, how they feel about themselves, and how well they are prepared for the future (Gouédard et al., 2020). It is common knowledge that motivated students who feel good about themselves tend to perform better academically. Furthermore, emerging research supports the concept of intentional curriculum design in cultivating student wellbeing (Slavin et al., 2012; Slavin et al., 2014; Tang and Ferguson, 2014). The curriculum shapes students' university experiences. It is used by a university to affect what and how students learn, as well as to mould their attitudes, behaviours, and worldviews. Depending on how successfully the curriculum encourages students' autonomous motivation and offers opportunities for learners to explore knowledge, autonomy, interactions, and inclusion, it will either enhance or hinder student wellbeing. If the curriculum is not structured to promote these elements for well-being, it may unwittingly damage students' psychological resources, leading to, or intensifying, mental health problems and, consequently, lead to poor outcomes. Curriculum is therefore both a product and a process designed to facilitate and deepen learning outcomes. To effectively accomplish the desired learning goals, it is necessary for curriculum designers to ask themselves, "what should be taught?" and "how should it be taught?" (Barnett, 2009).

Furthermore, Biggs (1987) and Diseth et al. (2010) highlighted the importance of both cognitive and motivational processes on learning, through phenomenological studies on students' approaches to learning. Such studies have provided broad characterizations of students' learning methods (e.g., surface vs. deep) that indicate motivational and self-regulatory control ensembles. Awang et al. (2017) demonstrated that based on the learning method used, students learn differently. Since student motivation and engagement are affected by the teaching styles and strategies applied that, consequently, will impact student achievement, choosing a suitable learning method that will help students get better results should be the priority (İlçin et al., 2018).

According to Zubair et al. (2017), MBA students' performance at private institutions in Malaysia is directly and significantly impacted by their active learning preferences. This is due to the fact that students who are engaged in active learning classrooms are often more energized, enjoy engaging in discussions and dialogue with other students, networking with lecturers, and spending more time in peer groups where they absorb and retain information that will help them achieve better results (Felder, 1988). Additionally, regarding distance learning Mendes da Silva et al. (2015) found that an active learning style has a strong positive correlation with student performance. This is because an active learner is more used to interacting and playing a part in the learning process and thus, is more flexible to receive new knowledge in different ways and tends to perform better in peer group activities

that seek collaboration and cooperation. For example, when it comes to group projects, an active learner is always likely to receive better results. (Lu and Yang, 2018). Therefore, we posit:

H4: Use of updated program design and multiple learning methods has a positive impact on student performance.

2.2.5. Creating a work climate that is conducive to learning

Providing students with academic and learning support, as well as a pleasant school environment, are two ways to promote learning beyond than the classroom (Kwesiga, 2002). Kirmani and Siddiquah (2008) found that the scholastic environment was a reliable predictor of students' academic success. Similarly, Mushtaq and Khan (2012) discovered a link between school environment and student achievement. Lladó et al. (2012) report that schools are still considered simply as instructional spaces, lacking consideration for their potential as transformational spaces. Thus, it is challenging for students to engage actively in many academic environments, ranging from classrooms to academic leadership structures. Thus, and as Savasci and Tomul (2013), and Roberts and Sampson (2011) stated, institutional learning facilities have been demonstrated to play an important effect in academic achievement.

Suresh (2006) conducted a survey and questioned students about their understandings of the support culture at their schools, specifically regardless of whether students were incentivized by their teachers and advisors or guided to seek additional help. Their perspectives on this culture were discovered to have an impact on their “barrier courses” outcomes. Suresh also investigated both physical and virtual learning environments. Considering the student engagement, and in alignment with other research (Astin, 1999; Tinto and Pusser, 2006), the campus environment's design has been shown to have an influence on student active participation and how effectively it encourages learners to work together or form learning communities. Additionally, Matthews et al. (2011) discovered that providing social learning environments might provide students with a channel to create social networks with schoolmates, which can result in increased involvement in active and collaborative learning and also promote transfer of knowledge to confront barriers to learning. Therefore, we posit:

H5: Creating a work climate that is conducive to learning has a positive impact on student performance.

3. METHODOLOGY AND RESULTS

3.1. MEASUREMENT

Our questionnaire measurement items were used without significant changes, simply adapting to the issue that we are studying. The items related to home/family constraints (HOME) are those mentioned by Younas et al. (2020); lack of top management and government support (GOV), program design: use of multiple and updated learning methods (PD) and creating a work climate that is conducive to learning (WORKC) by Sciarelli et al. (2020); learning in practice (LRACT) by Bangert (2004); and individual performance (IPERF) by Urbach et al. (2010). Appendix shows the items for all constructs.

3.2. DATA

The survey was written in English and translated into Portuguese, and then sent to internet users in Portugal for data collection (Brislin, 1970). We measure items by a seven-point numerical scale that ranges from strongly disagree (1) to strongly agree (7). Before data collection, a test was conducted with 27 individuals between 25 and 27 May 2022. Their answers were not taken into account in the final survey. The questionnaire was available between 28 May and 8 July 2022. We identified the target audience with the “key informant” method (Pinsonneault and Kraemer, 1993) in order to boost the questionnaire response rate. A link was sent by email and LinkedIn message requesting a response, and 164 valid responses were received. According to statistics about respondents’ characteristics (Table 1), 49% of respondents are female, 73% are between 21 and 25 years old, and 87% hold at least a bachelor’s degree.

Table 1: Sample characteristics

Distribution (n=164)					
Gender			Education		
Male	83	51%	High school or below	21	13%
Female	81	49%	Bachelor’s degree	99	60%
			Master's degree or higher	44	27%
Age			Occupation		
<21	37	23%	Employee	63	38%
21-25	120	73%	Self-employed	2	1%
>25	7	4%	Student	96	59%
			Unemployed	3	2%

3.3. RESULTS

The data were analysed using partial least squares structural equation modelling (PLS-SEM). Since this type of model is designed for prediction, none of the items are required to have a normal distribution, and the research model is considered comprehensive, the PLS method is applicable and suitable for this study (Henseler et al., 2009). We examined our hypothesized model using SmartPLS 3.2.7 (Ringle, Wende, and Becker, 2015). SEM hypotheses are assessed in two stages, first with the measurement models, then with the structural models.

3.3.1. Measurement Model

We follow the guidelines of Matsuno et al. (2005) to establish the validity and usefulness of a measurement model. Internal consistency, convergent validity, and discriminant validity are analysed for the measurement items.

a. Internal consistency:

The criteria to assess for internal consistency are Cronbach's alfa (CA) and composite reliability (CR), both of which must be above 0.7 for all latent variables, and as seen in Table 3, this requirement has been met. Hence, and as shown in Table 3, where CA and CR coefficients are reported, we are able to confirm that both values are greater than .8, and we can thus assume that the model has good internal consistency.

b. The convergent validity

The average variance extracted must be greater than .50 in order to ensure that the latent constructs describe more than half of the variation of their indicators. As seen in Table 3, the AVE for each construct is more than .50, implying convergence.

c. The discriminant validity

The discriminant validity depends on three criteria: First, Fornell and Larcker (1981) state that the square root of AVE should be greater than its correlation with any other construct. With the values available in Table 3, we can validate that the square root of AVE satisfies the condition.

Second, in order to establish discriminant validity, we must check the cross loadings requirement. This test specifies that the item loading must be greater than all cross loadings. (Götz et al., 2010; Grégoire and Fisher, 2006). In Table 2 the bold values show that the loadings are higher than the cross loadings, which suggests that the criterion has been satisfied. Two items, HOME1 and LP3, were removed since they did not satisfy the loadings and cross-loadings criterion.

Third, the HTMT criterion demonstrated that there was discriminant validity between constructs, as shown in Table 4, where the HTMT ratios have a value lower than 0.9 (Henseler et al., 2015).

Table 2: PLS loadings and cross-loading

Constructs		Home	GOV	LPract	PD	WorkC	IPERF
Home/Family constraints	HOME2	.903	.251	-.047	-.056	-.145	-.233
	HOME3	.883	.231	-.070	-.110	-.139	-.229
	HOME4	.809	.247	.083	-.003	-.012	-.117
	HOME5	.764	.142	.039	-.047	.018	-.128
	Lack of Top Management and Government Support	GOV1	.292	.826	.150	-.126	-.068
	GOV2	.188	.781	.112	-.139	-.168	-.207
	GOV3	.159	.810	.172	-.094	-.012	-.133
	GOV4	.227	.768	.178	-.065	.003	-.161
	GOV5	.155	.825	.268	-.085	.047	-.092
	GOV6	.203	.853	.170	-.212	-.103	-.240
	GOV7	.244	.794	.169	-.181	-.022	-.182
	GOV8	.162	.807	.090	-.222	-.114	-.194
Learning in practice	LP1	-.044	.185	.846	.206	.351	.314
	LP2	.027	-.005	.690	.419	.457	.376
	LP4	.001	.254	.870	.185	.329	.306
	LP5	-.055	.215	.849	.202	.338	.325
	Program design: Use of multiple and updated learning methods	PD1	-.020	-.187	.269	.877	.576
PD2		-.128	-.106	.298	.861	.637	.526
PD3		-.055	-.192	.296	.927	.669	.569
Creating a work climate that is conducive to learning	WKC1	-.093	-.042	.358	.557	.810	.473
	WKC2	-.042	-.151	.304	.572	.769	.464
	WKC3	-.130	-.052	.446	.583	.834	.559
	WKC4	-.068	-.006	.426	.527	.803	.470
	WKC5	-.095	-.094	.356	.643	.879	.556
Individual Performance	IP1	-.043	-.188	.352	.608	.557	.861
	IP2	-.249	-.179	.393	.627	.564	.887
	IP3	-.165	-.245	.384	.588	.599	.916
	IP4	-.263	-.216	.372	.517	.532	.883
	IP5	-.276	-.249	.312	.486	.443	.878
	IP6	-.206	-.227	.362	.540	.572	.874

Table 3: Means, standard deviations, correlations, and reliability and validity measures (CR, CA, and AVE) of latent variables

Constructs	Mean	SD	CA	CR	Home	GOV	LPract	PD	WorkC	IPERF
Home	1.749	1.272	.868	.906	.842					
GOV	4.472	1.287	.925	.938	.262	.809				
LPract	5.886	1.001	.831	.888	-.020	.191	.817			
PD	4.040	1.496	.867	.918	-.074	-.184	.323	.889		

WorkC	4.887	1.398	.878	.911	-.107	-.084	.462	.705	.820
IPERF	4.372	1.441	.944	.955	-.226	-.245	.412	.638	.883

Table 4: Heterotrait-Monotrait Ratio of correlations (HTMT)

Constructs	Home	GOV	LPract	PD	WorkC	IPERF
Home						
GOV	.276					
LPract	.085	.258				
PD	.086	.194	.367			
WorkC	.115	.115	.530	.809		
IPERF	.238	.244	.457	.701	.674	

3.3.2. Structural Model

Figure 2 shows the path coefficients and t-statistic values obtained from R^2 bootstrapping using 5,000 resamples. The estimates of the coefficients obtained from a bootstrap distribution are comparable to the sample distribution and could represent the parameter's population standard error. As a result, the measurement of t-values aids in determining the significance of each indicator. Multicollinearity was assessed using the variance inflation factor (VIF). All constructs met the criterion with values below 5, so it is concluded that there is no multicollinearity (Hair et al., 2016).

Therefore, we can assume that 53.5% of the variation in student individual performance can be explained by the model. The home/family constraints ($\hat{\beta} = -0.126$, $p < 0.05$), the lack of top management and government support ($\hat{\beta} = -0.167$, $p < 0.05$), learning in practice ($\hat{\beta} = 0.215$, $p < 0.01$), program design ($\hat{\beta} = 0.361$, $p < 0.001$), and work climate ($\hat{\beta} = 0.238$, $p < 0.05$) are statistically significant, supporting all five hypotheses (H1, H2, H3, H4, and H5).

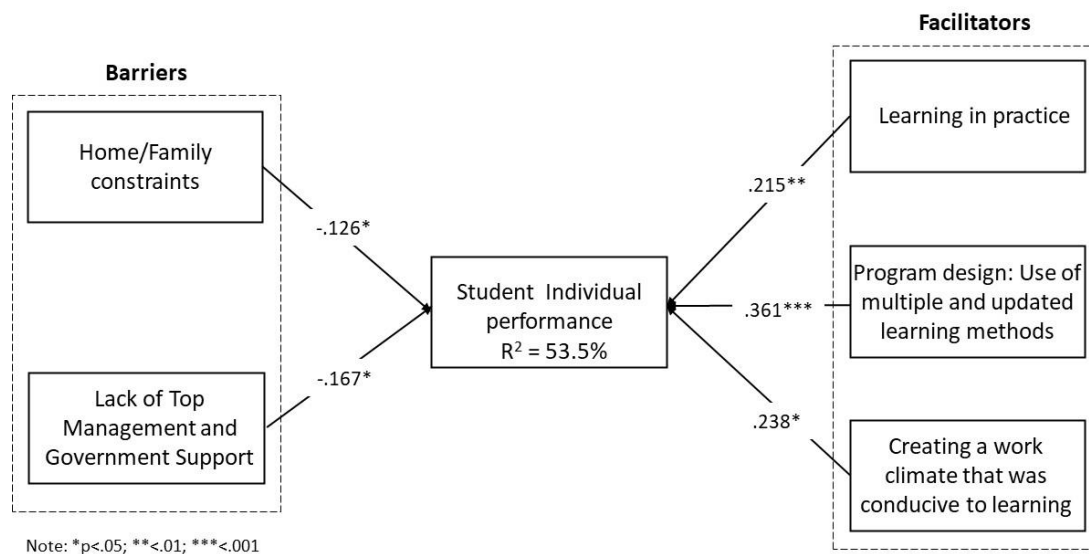


Figure 2: Estimated Research Model

4. DISCUSSION

Our aim is to understand which variables can act as a barrier and as a facilitator to students' individual performance. In order to do so, we performed a literature review that led us to select five constructs, which we then hypothesized. All five hypotheses were supported by the results, so it can be said that the hypotheses we have selected were totally confirmed.

4.1. THEORETICAL IMPLICATIONS

Much remains to fully understand what factors are most important in academic achievement. In fact, the field has not yet reached its full potential. However, most research has not addressed the topic in the same manner that we did. The main benefit of our study is that we combine all models already tested into a single one with all the main possible factors – demographic and social factors (home and family constraints) as well as school factors (such as the design of the program and methods used) that might be relevant when studying student achievement and success. We hope to contribute valuable information to the educational literature by adopting an all-encompassing, practical, and complete methodology. Considering our study's findings, which mostly support those of previous research studying related constructs, we are able to conclude that all of the hypotheses we examined to identify which factors impact student performance are valid.

Regarding hypothesis H1, earlier studies such as Muola (2010) demonstrate how lack of family support and a difficult home environment can negatively influence academic achievement, as confirmed in our study. As the results suggest, and as expected, family support is a key factor in the academic development of a child. Having home learning facilities may promote greater motivation, focus, and be an incentive for better academic achievements (Atkinson, 1966; Gottfried et al., 1998). Being part of a family defines a person in many and different ways. It helps a person grow psychologically and emotionally, giving important tools that can be used in one's personal life, and also on the academic pathway. Family support and encouragement are two of the most important motivators to a child. Family members can serve as role models and inspiration throughout one's academic career and can also provide support and advice regarding possible failures, helping one to persist in the academic journey chosen (McDonald et al., 2001). A child whose effort to do well in school is not supplemented by the provision of the required home learning facilities and family support might have a low motivation for academic achievement and consequently obtain poorer results.

Lack of home support is not the only factor that can negatively affect a student's achievement. As shown by H2, if the government and the school's top management do not apply the necessary support to the schools, the student will, even if indirectly, be affected by leaderships' choices (Senguo and Ilomo, 2020). In this new era of momentous changes in a short period of time, education has a difficult challenge. It must remain updated while not forgetting the essential basis to childhood development. Governments and leaders must be aware of students' needs and act accordingly (Seashore et al., 2010). The school must be a place where students can develop skills that will be important in their future, and that serve as a motivator for students. Furthermore, it is important to guarantee that all staff is motivated and supported by superiors. For example, their needs must be taken into consideration and their worries be heard (Jacobson, 2011). Nevertheless, being listened to is not

enough, since financial support has an enormous influence on the dynamics of a school (Mutula, 2009; Ali et al., 2013).

As explained by H3, H4, and H5, if the school offers the student a space to grow personally and academically, better results can be expected. Firstly, these can be achieved by adjusting learning methodologies to students' needs (Slavin et al., 2012; Slavin et al., 2014; Tang and Ferguson, 2014). Applying different ways of teaching and promoting a more hands-on learning (Newmann et al., 2001), appear to play an important role in the academic success of students. Being able to put in practice what they have already learnt helps students reinforce their strengths and also helps students and professors to acknowledge their difficulties and weaknesses. Secondly, being the active learner of one's own academic life seems to be a facilitator of success. Having an updated curriculum is a wise way of accommodating students' particular interests in a way that stimulates their unique role in the learning process, leading to better results (Mendes da Silva et al., 2015). Lastly, the environment surrounding a student also affects the student's achievements. Having facilities such as libraries, computers, or students' rooms, promotes interaction between students and enables them to share their experiences, learn from each other, and develop soft skills that will be beneficial throughout their academic pathway (Mushtaq and Khan, 2012).

4.2. PRACTICAL IMPLICATIONS

We can draw several useful applications from the study. The research emphasizes the idea of the influence that family and the home environment have on a student. Since it is not possible to alter the family environment, society and school have even more responsibility in trying to capacitate all students in the same way. One way to do that can be by investing in an education system that includes learning methods that are adjusted to students' needs, for example creating an individual learning program for each student. This method makes two things possible: first, schools would be able to level up students; and, in another way, give students detailed information regarding their performance and give them the tools to minimize their weaknesses and promote their strengths.

This would only be possible if the top management decentralized the power of educational methods decisions, giving schools the power to act according to their own special needs. Funding schools and providing better digital and technological networks with updated learning methods would capacitate schools, staff, and students to achieve greater success.

Our study confirms the importance of having updated and adjusted school curricula and learning methods. One way of evaluating these methods and guaranteeing that their positive application could be done, would be to apply surveys and questionnaires to students and schools' staff, promoting an active participation in all school life activities.

In the case of Portugal's schools investment in and development of school facilities is essential. These spaces can serve as a place beyond classrooms where students can explore and put into practice what they have learned. These rooms, such as libraries and computer and advanced technology centres play an even greater positive impact when addressing students with different backgrounds and resources.

5. CONCLUSIONS

There is still much work to be done to understand the factors that affect academic achievement. Nevertheless, the greatest advantage of this study was being able to work with data that join and evaluate both personal and school factors. Our findings indicate that academic success disparities and gaps remain between students from distinct backgrounds. Students from less healthy households perform more poorly in school and it is vital to urgently address this issue that still stains our educational system. We can also point out that adjusted and updated learning methods combined with practical classes, when well applied, are a powerful tool to help students achieve better results. However, if a school is not well funded and if the values are not aligned between the top management and remaining educational undertakings, it will act as a barrier to academic achievement. Finally, we can assert that the school facilities can also play a part as a facilitator to student motivation and engagement, and consequently positively affect the student performance.

6. LIMITATIONS AND RECOMMENDATIONS FOR FUTURE WORK

There are certain limitations that must be recognized in the study. The first concerns a constrained period of time for data collection, and the sample's demographic features. Despite the fact that the data were gathered in one country, the majority of those surveyed had a bachelor's degree or above. It would be interesting to find out if our results hold value in samples from different demographic groups and other countries. It certainly would be useful to undertake an estimation of student performance over time, in which each student is "tracked" throughout their school career and results from other countries are compared.

Secondly, another limitation to point out concerns the hypotheses posited. Although we have selected the five main barriers and facilitators that impact students' performance that we retrieved from the literature review, it would be interesting to add to the study more factors. However, that would imply a wider study with more investment of time and resources. Thirdly, and according to the previous point, future research should pay greater attention to the moderating and mediating effects of other factors. Although we have sought to test it in this study, the data and the factors that we have yielded results that were less robust than desired.

Finally, although it was not the aim of our study, we recommend to further explore each factor. While, in our discussion we sought to suggest some solutions, it would be important to guarantee the viability of those solutions and how to apply them successfully.

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APPENDIX

Appendix - Items

Constructs	Items	Adapted from
Home/Family constraints	HOME1 "I feel like an essential part of my family that boosts my confidence."	Younas, Liu, Khalid and Bakar (2021)
	HOME2 "My brothers and sisters provide me a favorable environment to improve my studies."	
	HOME3 "My parents encourage me in my learning."	
	HOME4 "I am provided with all basic needs at my home."	
	HOME5 "My parents provide me most of the recommended textbooks."	
Lack of Top Management and Government Support	GOV1 "The department's policies and strategies are in line with its mission, vision and values"	(Mauro Sciarelli, Mohamed Hani Gheith, 2020)
	GOV2 "The department's policies and strategies are clearly formulated and documented"	
	GOV3 "There is a formal process of reviewing and updating policies and strategies"	
	GOV4 "Policies and strategies are communicated at all levels of the department"	
	GOV5 "The formulation and revision of policies and strategies include the needs and expectations of the stakeholders"	
	GOV6 "Directors actively participate in quality improvements efforts and support the improvement process"	
	GOV7 "Directors encourage student's and staff's involvement in the improvement actions"	
	GOV8 "Directors empower faculty members and staff to manage and solve quality problems"	
Learning in practice	LP1 "The SPSS software increased my interest in educational statistics."	(Arthur W. Bangert, 2004)
	LP2 "The instructor used WebCT to facilitate thoughtful discussions."	
	LP3 "The course was designed to allow me to take responsibility for my own learning."	
	LP4 "WebCT was used to create an efficient learning environment. "	
	LP5 "WebCT helped me to learn educational statistics more quickly"	
Program design: Use of multiple and updated	PD1 "Our institution often develops new teaching materials and methodologies"	(Mauro Sciarelli, Mohamed Hani Gheith, 2020)
	PD2 "Curriculum and academic programs are evaluated and updated every year"	

learning methods	PD3	“Our institution incorporates new techniques/inputs in producing programs/services”	
Creating a work climate that is conducive to learning	WKC1	“The academic performance of faculty members is appraised regularly”	(Mauro Sciarelli, Mohamed Hani Gheith, 2020)
	WKC2	“There are suitable channels for sharing and communicating “better practice,” knowledge and experiences”	
	WKC3	“Our department has cross-functional teams and supports teamwork”	
	WKC4	“Our institution constantly emphasizes development and doing research projects”	
	WKC5	“Our institution is trying to bring in new equipment (i.e. computers) to facilitate educational operations and work procedures”	
Individual Performance	IP1	“The employee portal enables me to accomplish tasks more quickly.”	(Urbach et al., 2010)
	IP2	“The employee portal improves my job performance.”	
	IP3	“The employee portal increases my productivity.”	
	IP4	“The employee portal enhances my job effectiveness.”	
	IP5	“The employee portal makes it easier to accomplish tasks.”	
	IP6	“The employee portal is useful for my job.”	
