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ORIGINAL RESEARCH

Academic Readiness and Its Impact on Medical Students' Performance: A Critical Analysis in The Context of Covid-19 Pandemic

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ABSTRACT

Background: Student academic achievement in the first semester tends to be low and will increase the following semester. Many factors, including academic readiness, can influence this. Students have a diverse academic readiness, whereas a higher level of academic readiness would result in higher academic achievement. Previous research stated several factors shaped academic achievement in offline learning; however, online learning needs further exploration.
Aims: Researchers aimed to discover the factors of academic readiness that affect students' academic achievement in online learning models during the COVID-19 pandemic.
Methods: This research is a descriptive-analytic observational study with a cross-sectional approach. All dimensions were measured using a validated Academic Readiness Questioner direct translation questionnaire and using secondary data. Partial Least Squares with Structural Equation Model techniques using the Smart-PLS version 3.0 application were employed for data analysis.
Result: This study produced an excellent, robust model with a GoF value > 0.36. Path analysis shows that all O-samples are positive with t statistics > 1.97, so these factors significantly positively affect academic readiness, except for the reading behavior dimension. Academic achievement is influenced by academic readiness, with R2=15.4%.
Conclusion: Students' academic readiness positively and significantly affects academic achievement. Student academic readiness during online learning is shaped by achievement motivation orientation, goal orientation, integrated support, learning efficacy, M-score, social and economic conditions, number of credits, and reading behavior.

Keywords: *Academic readiness, academic achievement, online learning, COVID-19 pandemic*

ABSTRAK

Latar Belakang: *Prestasi akademik mahasiswa pada semester pertama cenderung rendah dan akan meningkat pada semester berikutnya, hal tersebut dapat dipengaruhi oleh banyak faktor salah satunya kesiapan akademik. Mahasiswa memiliki kesiapan akademik yang beraneka ragam. Tingkat kesiapan akademik yang tinggi berdampak pula pada tingginya prestasi akademik yang akan diraih. Penelitian sebelumnya telah menulis bahwa prestasi akademik pada pembelajaran luring dibentuk oleh beberapa dimensi. Sedangkan pada pembelajaran daring masih perlu dieksplorasi lebih lanjut.*
Tujuan: *Peneliti ingin mengetahui faktor-faktor kesiapan akademik yang memengaruhi prestasi akademik mahasiswa pada model pembelajaran daring di masa pandemi COVID-19.*

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Metode: *Penelitian ini merupakan penelitian observasi deskriptif analitik dengan pendekatan cross sectional. Seluruh dimensi diukur menggunakan kuesioner terjemahan langsung Academic Readiness Questioner yang sudah tervalidasi serta menggunakan data sekunder. Analisa data menggunakan jalur Partial Least :Squares dengan teknik Structural Equation Model menggunakan aplikasi Smart-PLS versi 3.0.*

Hasil: *Penelitian ini menghasilkan model yang baik dan kuat dengan nilai GoF >0.36. Analisis jalur menunjukan semua nilai O-sample positif dengan t statistik > 1.97 sehingga semua dimensi berpengaruh positif secara signifikan membentuk kesiapan akademik, kecuali dimensi perilaku membaca. Prestasi akademik dipengaruhi oleh kesiapan akademik dengan R2=15,4%.*

Kesimpulan: *Kesiapan akademik mahasiswa berpengaruh secara positif dan signifikan memengaruhi prestasi akademik. Kesiapan akademik mahasiswa pada saat pembelajaran daring dibentuk oleh dimensi orientasi motivasi berprestasi, orientasi tujuan, dukungan terintegrasi, efikasi belajar, M-score, kondisi sosial dan ekonomi, jumlah SKS, dan perilaku membaca.*

Kata Kunci: *kesiapan akademik, prestasi akademik, pembelajaran daring, pandemi COVID-19*

PRACTICE POINTS

- Academic readiness factors, including study habits, technological preparedness, and self-motivation, play a crucial role in determining student achievement across both online and traditional learning environments.
- In online learning settings, the number of semester credit units taken emerges as the most significant predictor of academic success, with students carrying higher credit loads demonstrating increased engagement and better academic performance.
- Comprehensive support systems, including technological infrastructure and learning resources, are essential elements that significantly contribute to student success and academic readiness in online learning environments.

INTRODUCTION

Medical students in the private medical faculty often experience significant challenges during their academic journey, particularly evident in their Grade Point Average (GPA) during the initial semester. Data collected from private medical faculty indicates that 26.5% of students recorded a GPA of less than 2.0 in their first semester, a stark contrast to only 8.8% in the second semester of 2020. This decline in academic performance can largely be attributed to the low academic readiness of these students at the onset of their medical education. According to Lemmens, Plessis, and Maree (2011), academic readiness is crucial for success in higher education institutions, as it encompasses various factors that influence a student's ability to adapt and thrive in a demanding academic environment.[1]

Furthermore, the academic readiness of medical students during the transition from preclinical to clinical education (measured using the Aydin and Tasci scale) showed that most students achieved sufficient academic readiness (average score of 3.48). This indicates that the level of readiness still needs to be improved.[2] This suggests that many students may still struggle with the foundational knowledge and skills necessary for success in clinical settings. The Aydin and Tasci scale assesses the academic readiness of medical students across five dimensions: transition

phase, workload, patient contact, knowledge and skill, and learning and education. The results reveal that deficiencies in academic readiness are often linked to a lack of foundational knowledge and skills, which can hinder students' performance in clinical education.[2] Increasing preclinical academic readiness, especially early in their studies, would improve knowledge, skills, and academic achievements.

Conley (2010) emphasizes the importance of being college and career-ready, suggesting that a robust preparation phase is essential for students to succeed beyond high school. The findings from these studies underscore the necessity of enhancing preclinical academic readiness, particularly in the early stages of medical training, to bolster students' knowledge and skills. By addressing these gaps in readiness, educational institutions can foster improved academic achievements and better prepare their students for the rigors of clinical practice. Ultimately, a comprehensive approach that includes targeted support and resources during the initial phases of medical education is essential for cultivating a skilled and competent future healthcare workforce.[3]

Student academic readiness is a critical measure of a student's preparedness within an educational institution, reflecting their ability to successfully complete their studies without the necessity of enrolling in additional programs for improvement in higher education.[3] This concept extends beyond mere academic achievements in prior education or psychometric evaluations conducted upon entering higher education. It encompasses a myriad of sociocultural factors and the student's intrinsic motivation to pursue their chosen career path.[3] For instance, research indicates that a student's academic readiness is influenced not only by their previous educational experiences but also by their engagement with reading materials, learning efficacy, and goal orientation. Furthermore, an integrated support system, socioeconomic conditions, study burden, and score on national exit examinations in the senior high school (M-Score) significantly shape a student's readiness for academic challenges.[1]

The COVID-19 pandemic has caused an upheaval in social, economic, and cultural norms and altered the learning model, particularly the assessment in higher education. It also directly influences the student's academic readiness. Therefore, it is necessary to re-evaluate and re-assess these factors during the pandemic or post-pandemic, where many of the learning processes are done by online learning. This study aimed to measure student readiness for online learning sessions during the COVID-19 pandemic and analyze its influence on academic achievement. By understanding the dynamics of academic readiness in the context of online learning, medical education can design more effective support programs to prepare competent future doctors in the digital era while ensuring the sustainability of healthcare service quality in the future. Previously, it was known that the determining factors on offline learning that mostly influence a student's academic readiness were academic motivation orientation, M-score, extracurricular activity, goal orientation, gender, socioeconomic conditions, integrated support, credit semester number, learning efficacy, reading habits, and academic performance.[4,5,6,7,8]

METHODS

This study was conducted using a quantitative cross-sectional design and analyzed using a descriptive observational model using SEM–PLS path analysis. This study aimed to determine the factors that constitute academic readiness and how they affect student academic achievement. Primary data (academic readiness) was collected online using Zoom, and the students were asked to complete a Google Form simultaneously. In addition, secondary data (academic achievement) was collected from the medical study program. The respondents in this study were current active students enrolled in medical study programs in the Private Medical Faculty in the 1st, 2nd, and 3rd year. The number of samples required was calculated using the Krejcie and Morgan formula, whereas 240 samples were obtained from the total population of 305 people. The sampling technique used was purposive sampling to select respondents who qualified for the inclusion and exclusion criteria.

The inclusion criteria were all students enrolled in a medical science program in the Medical Faculty, in the 1st, 2nd, or 3rd year of study, and have enrolled in

a study block. The exclusion criteria were students who were not present during the study, were not present during the study block, and were not enrolled in the study block that was used for data collecting in this study. From the population, 232 respondents qualified for the inclusion criteria. Eight respondents were not present in this study.

The primary data was collected using a direct translation of the ARQ questionnaire that Lemmens had patented.[9] The validity and reliability of the questionnaire were conducted on 30 students outside the population, whereas a positive correlation (>0.361) and a Cronbach's Alpha score of >0.95 was obtained, and therefore, the questionnaire was deemed valid and reliable. The secondary data on academic achievement was obtained from a medical study program at a private medical school.

The questionnaire in this study used a Likert scale and consisted of 83 questions. These questions consisted of several dimensions: the orientation of academic motivation, goal orientation, integrated support, learning efficacy, M-score, socioeconomic status, the number of semester credit systems, and reading habits. This study had received ethical clearance from Komisi Etik Penelitian Kedokteran dan Kesehatan Fakultas Kedokteran, Kesehatan Masyarakat, dan Keperawatan Universitas Gadjah Mada with a documented Ethical Approval No. KE/FK/0276/EC/2020.

RESULTS AND DISCUSSION

The bootstrapped calculated model after using the SEM-PLS method is shown in Figure 1. A model of fit and a goodness of fit (GoF) score were done to test model fitness. Table 1 shows the normed fit index (NFI) score (0.713) which indicates a 71% fit, and a GoF score of 0.557, showing that the model was appropriate.

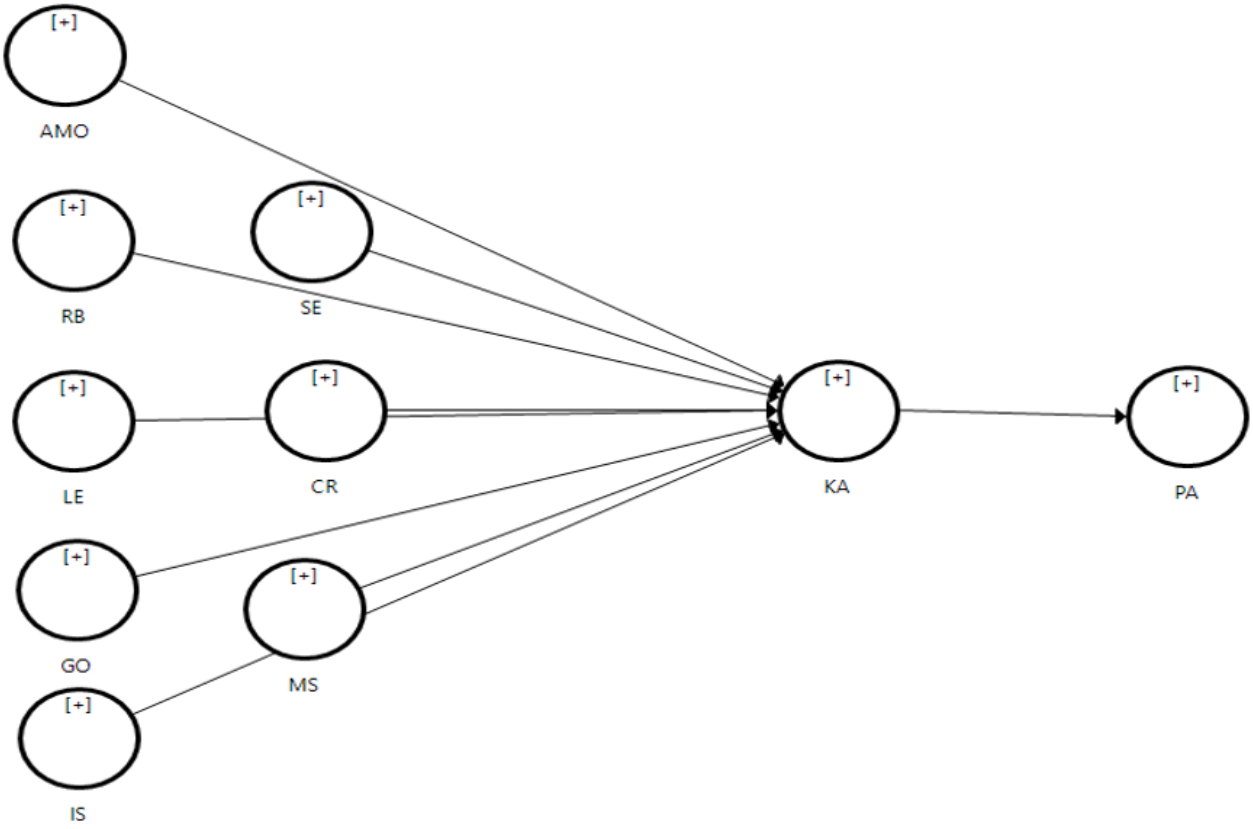

Figure 1. A calculated construct model. AMO: Achievement Motivation Orientation, RB: Reading Behaviour, LE: Learning Efficacy, GO: Goal Orientation, IS: Integrated Support, SE: Socio-economic conditions, CR: Semester Credit Unit, MS: M-Score, KA: Academic Readiness, PA: Academic Achievement

Eight dimensions determine academic readiness, and academic readiness influences academic achievement according to the model in Figure 1.

Table 1. Model of Fit Calculation

	Saturated Model	Estimated Model
SRMR	0,073	0,073
d_ULS	2,330	2,330
d_G	0,623	0,623
Chi-Square	806,728	806,728
NFI	0,713	0,713

Table 2 shows an analysis to determine the relationship between variables or hypotheses determined by the T-statistics score and the p-values. Academic readiness significantly positively influenced academic achievement. Academic readiness was influenced considerably by achievement motivation orientation, integrated support, learning efficacy, M-score, social and economic conditions, and semester credit unit. Reading habits also positively influenced academic readiness, but it was not significant.

The study revealed that the number of completed semester credit units emerged as the most significant predictor of academic readiness, demonstrated by an exceptionally high T-statistic of 19.241 and an original sample score of 0.650 ($p<0.05$). This robust statistical relationship underscores the fundamental role of accumulated academic experience in developing student preparedness. This is further enforced by current theories, which reach similar conclusions: academic readiness formed by the number of semester credit units taken previously significantly influenced academic achievement.[1,14] The semester credit unit is a unit that states the academic burden of a student and is a main factor in determining cumulative effort success.[13] Students who have completed more semester credit units will have better academic achievements.[9]

The study found a significant positive correlation between socioeconomic conditions and academic readiness. This relationship was evaluated through a comprehensive assessment of social status indicators, including parental education levels, employment status, and income.[11] Particularly noteworthy is the alignment with Suyono's (2016) findings, which demonstrated that parents with higher educational attainment tend to foster greater social engagement in university activities, provide more effective academic motivation and support, create an environment of healthy academic challenge and enable better access to educational resources and facilities.[15] These advantages collectively

Table 2. Relationship between Variables

	Original Sample (O)	T-statistics (|O/STDEV|)	p-values	R
AMO-> KA	0,173	3,731	0,000	Significant
GO -> KA	0,204	5,195	0,000	Significant
IS -> KA	0,157	4,331	0,000	Significant
LE -> KA	0,140	3,364	0,000	Significant
RB -> KA	0,051	1,325	0,093	Not Significant
MS -> KA	0,078	1,965	0,025	Significant
SE -> KA	0,224	6,064	0,000	Significant
CR -> KA	0,650	19,241	0,000	Significant
KA -> PA	0,172	2,762	0,003	Significant

Table 2 shows the relationship between variables determined by T-statistics and p-value scores. * AMO: Achievement Motivation Orientation, RB: Reading Behaviour, LE: Learning Efficacy, GO: Goal Orientationo, IS: Integrated Support, SE: Socio-economic conditions, CR: Semester Credit Unit, MS: M-Score, KA: Academic Readiness, PA: Academic Achievement.

contribute to enhanced learning opportunities and improved academic performance. The absence of financial constraints allows students to fully utilize available educational resources, creating an optimal environment for academic success.

Goal orientation, integrated support, and motivation orientation emerged as significant positive influences on academic readiness (Table 2). Schunk (2004) has described that goal orientation is often linked to performance goal orientation.[16] Students who were performance goal-oriented aimed to have a good standing with their peers and lecturers. They often try to surpass their own learning goals or standards, want to score higher than their peers, and avoid bad marks or appearing incompetent in front of their peers.[17] Students who have performance goal orientation usually have better academic performance.[10] They tend to be disinterested in the subject material; the goal is to create a better public image.[10] It is assumed that to achieve success and avoid failure, students with performance goal orientation would strategize and manage their study schedule and tasks and organize their study area as best they can to achieve their goal.[5]

The effects of integrated support in academic readiness have been explained by Moore's theory regarding the individual, their family, peers, and institution. Parents and immediate family would have a strong relationship with individual academic achievement.[18] Ryan (2014) has shown that peers affect the study process. A complete support system would motivate students in academic learning and reduce the pressure created in the learning process.[18] This gives a higher chance for the student to achieve academic success.

The influence of motivation on achievement orientation in academic readiness is shown in several different types of research. Moore, Grabsch, and Rotter (2010) found that motivation for achievement would induce a person to increase his competence to fulfill a need for achievement, power, and good networking.[20] These needs are often fulfilled by achieving higher education; therefore, it would be motivation to pursue such higher education.[21] A student's intrinsic interest plays an important role and is crucial in activating many skills required for effective learning, such as planning and self-evaluation, thinking, and learning skills which would form a readiness to face academic and non-academic challenges.[22]

Someone assessing their learning efficacy can predict their ability to finish a task.[24] An individual with a high learning efficacy tends to increase their effort and try harder to achieve their goals.[23] These individuals make an effort to manage and prepare any activity that can support success, prioritize any activity they would undertake, measure the amount of effort required to finish their task, and assess whether or not they can complete the required task.[25] Learning efficacy would increase if they successfully complete a learning task and would increase their readiness to face new challenges in completing future tasks.[26] An individual with a high learning efficacy would consider themselves able to succeed academically.[27] Thus, learning efficacy would be a good predictor for academic achievement.[9]

Students also form academic readiness when they are in their previous level of education.[21] The M-score would give a true assessment of a student's ability.[28] Therefore, the M-score is important in determining academic readiness in higher education. This is also found in this study. However, in Indonesia, what is used as a measuring tool for entering universities without an entrance test is the semester report scores achieved during the education process in senior high school, not the national exit examination. Some discrepancies between semester report scores and the national exit examination score may exist.

Reading habits positively influence academic readiness, however, the effects were not significant (Table 2). It happened because the student has bad reading habits in the pandemic era with online learning. Lemmens (2011) described that the negative influences that are formed by bad reading habits, e.g., reading for pleasure, would mean that the students waste a large amount of time reading non-academic literature, and are reluctant to learn academic literature necessitated by the university.[1]

The research demonstrates that all dimensions collectively shape academic readiness, significantly

influencing academic achievement.[4,5,6,7,8] Students with good academic readiness will be able to follow the learning process effectively so that these students can achieve the desired competencies or learning goals at the time of evaluation. The dimension of academic readiness that most shapes academic readiness is the number of semester credit units taken. So that students who have more experience in learning processes will have better academic achievements. This is different from previous research by Lemmens (2011), which said that the largest dimension of forming readiness was linked to differences in sociocultural aspects, economic factors, and study opportunities linked to race/skin color.[1] Our study highlights the primacy of accumulated academic experience through credit units, suggesting a more direct relationship between educational exposure and academic success.

This research has limitations related to the place where it was conducted, which was limited to only one place/location, making it difficult to generalize. Meanwhile, this research has advantages, including that it was carried out during the COVID-19 pandemic, where all learning processes were conducted online. Apart from that, data analysis for this research was carried out using SEM-PLS path analysis, which is able to measure latent variables comprehensively and see the strength of the relationship between the dimensions that form the academic readiness variable. This enhanced understanding of academic readiness factors provides valuable guidance for medical education institutions in developing targeted support systems and educational interventions.

CONCLUSION

Academic readiness in online learning emerges as a complex interplay of multiple critical factors significantly influencing student success. Research demonstrates that students who undertake higher credit loads typically achieve better academic performance due to increased engagement and commitment to their studies. However, socioeconomic conditions deeply influence this relationship, which can create substantial barriers, particularly for students facing technological limitations or lacking adequate study environments. Goal orientation and intrinsic motivation are crucial for academic success, reinforced by integrated support systems. Additionally, the M-score and reading habits affect comprehension and retention. Educational institutions must address these factors to enhance academic readiness, ensuring all students have equal opportunities to thrive in online settings. This includes providing resources for underprivileged students, fostering a goal-oriented mindset, and ensuring robust support systems are in place. By adopting a holistic approach, institutions can create an equitable and supportive learning environment, benefiting both individual learners and the overall quality of online education.

RECOMMENDATIONS

Based on the study's findings, several crucial recommendations are proposed for future research endeavors. First and foremost, researchers should expand their investigation to encompass additional dimensions of academic readiness, specifically focusing on intellectual capabilities, emotional intelligence, and spiritual aspects that may significantly influence academic achievement. This expanded scope would provide a more comprehensive understanding of the factors contributing to student success in online learning environments. Furthermore, to enhance the validity and reliability of the research instruments, future studies should extend their reach to diverse geographical locations, incorporate larger and more varied population samples, and implement longitudinal approaches to track changes over time. Additionally, the development of standardized assessment tools that can effectively measure these multiple dimensions of academic readiness would be beneficial for educational institutions in their efforts to support student success. By implementing these recommendations, researchers and educators can work towards creating more effective and inclusive online learning environments that address the diverse needs of students across all dimensions of academic preparedness.

COMPETING INTEREST

The authors declare that there are no competing interests related to this study.

LIST OF ABBREVIATIONS

AMO : Achievement Motivation Orientation (Orientasi Motivasi Berprestasi)
ARQ : Academic Readiness Questioner
CR : Credit Registered (Jumlah Satuan Kredit Semester)
GO : Goal Orientation (Orientasi Tujuan)
IS : Integrated Support (Dukungan Terintegrasi)
KA : Kesiapan Akademik
LE : Learning Efficacy (Efikasi Belajar)
MS : M-score
PA : Prestasi Akademik
PLS : Partial Least Squares
RB : Reading Behavior (Perilaku Belajar)
SE : Socio-economic Condition (Kondisi Sosial dan Ekonomi)
SEM : Structural Equation Model
SKS : Satuan Kredit Semester

KONTRIBUSI PENULIS

Marindra Firmansyah – developing a research proposal, collecting data, data analysis, and publication the manuscript.

Amanita Dias Ezha Putri – developing research proposal, collecting data, data analysis, and publication the manuscript.

Rizki Anisa – developing research proposal, and publication the manuscript.

Rio Risandiansyah – data analysis, and publication the manuscript.

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