Barriers to Learning in Humanities – The Relationship between First Language Skills and Learning Outcomes in Educational Science

Fabian Gunnars[1], Peter Mozelius[2], Jimmy Jaldemark[3], Marcia Håkansson Lindqvist[4]

Mid Sweden University, Department of Education, Sundsvall, Sweden[1,2,3,4]

Abstract

In higher education, different disciplines have different prerequisites. Science, Technology, Engineering and Math (STEM) education often requires certain earlier course studies with specified grades in subjects such as mathematics and physics. In humanities, many research studies report on student failure due to insufficient second language skills in English. Fewer studies have reported on the importance of sufficient first language skills to cope with reading and writing in the intensive courses that are frequent in social science and humanities. The aim of this study is to investigate the potential relationship between students' secondary school grades in their first language, and their learning outcomes in university programmes, given in the same language, at a department of education. The research question that guided this study was: what is the relationship between students' grades in Swedish at secondary level and their level of completion of five-year university programmes. Data include N=2,583 unique students taking full teacher certification programmes at the university during 2016–2024 and was obtained and examined by SQLs from national databases Swedish Council for Higher Education and Ladok. Cross-mapping of data and basic statistical analysis, including linear multiple regression, was performed in SPSS. Results indicate that above average grade levels were connected with higher expected degree completion. A trend with increasingly higher grades in all admitted students during recent years was also observed. These results may concern educational stakeholders and policymakers that work with educational design and related implementations in university programmes. Implications from this study are further discussed, such as potential consequences of restricting university programmes to certain grade level prerequisites, and considerations to generic skills for degree completion of the students.

Keywords: *Higher education, Learning outcomes, Educational science, Humanities readiness, STEM readiness, University programmes*

1. Introduction

In the wide variety of disciplines in contemporary higher education, there are differences regarding pedagogy and curricula design. Moreover, there are also differences when it comes to prerequisites, where Science, Technology, Engineering and Math (STEM) education as an example requires specific grades in subjects such as mathematics, chemistry and physics [1], [2]. In the field of humanities, the prerequisites are more generally specified compared to the specific grade requirements in STEM education. There are many research studies reporting on students failing in their studies with incomplete degree competition due to insufficient second language skills in English [3], [4], [5]. Fewer studies have reported on the importance of adequate first language skills to be able to cope with the intense reading and writing that are frequent in courses given in the fields of social science and humanities. Such coping may be related to the expected degree completion of the students.

What can be learnt from STEM studies is that language skills are essential for a deeper understanding of complex phenomena [4], [6]. Such understanding is an aspect that has been found to be even more important in STEM teacher training to improve their ability to explain STEM concepts [7]. Furthermore, as highlighted in the study by Applet et al. [8], lack of language skills can reduce students' future career opportunities. The Canadian study by Card and Payne [9] found that courses and grades in the last year(s) of high school fully determined students' academic opportunities at the university level, relating a so called 'STEM readiness'. As found in the study by Kurban and Cabrera [10], STEM readiness depends on STEM self-efficacy and STEM interest, leading to the recommendation to create "intervention programs that encourage the development of self-efficacy in math and science domains" [10, p. 640]. Without STEM readiness, students risk failing their studies and dropping out of the university programmes they have enrolled in, with incomplete degrees [9].

It seems relevant to assume that the same can be expected of students without 'Humanities readiness'. As highlighted by Arnbjörnsdóttir and Prinz [11], it is valuable to develop writing skills to be

successful in humanities. Compared to STEM once more, it appears that self-efficacy could be a factor to consider in humanities as well, and that 'Humanities readiness' also has an academic impact on learning outcomes in university courses in humanities, such as expected degree completion. The preparation pathways described in Sun and Davison [12], with language training for international students might be an idea for national students as well. Therefore, this study presents national learning outcomes in the light of national students' language skills.

The studied university in the presented paper is located in the middle of Sweden. Full student enrolment at the university 2016–2024 consisted of approximately 13 000–21 000 students per year, with some admitted registrations overlapping for same students of previous years. Around 850–2 000 of these students each year during the same period were enrolled at the department of Education and its educational science programs. Educational science programs in Sweden are divided into at least two different categories. The first category includes shorter programs for students with an earlier academic degree that embrace between one to two years fulltime studies, 60-120 credit points. The other educational science programs are longer university programmes, many for teacher certification including full-time studies for at least three years, in some cases, up to five and a half years. In these university programs students have placements at schools or other educational institutions for up to 20 weeks. Other studies include theoretical studies at the university. Therefore, the students' workload in the theoretical courses requires high skills in reading and writing. Many of the students are recruited regionally, including regions with lower socio-economic status and lower enrolment to higher education than the average in Sweden. Earlier studies show that students with lower socio-economic status have a higher drop-out rate in academic studies [13].

The underlying problem that motivates this study is the number of student drop-outs at the department where the authors work. The hypothesis is that this is not a local problem for one specific single department, but a more general issue for higher education. In recent years, media publication discourse points towards decreasing grade levels in of Swedish first language, and subsequent recommendations to raise the requirements for university programmes [14, 15]. To investigate this phenomena, the national databases at the Swedish Council for Higher Education were searched for results during the period of 2016-2024. The analyzed search results involved 2 583 unique student records. This study aims to investigate the potential relationship between students' secondary school grades in their first language, their learning outcomes in university programmes, given in the same language, at a department of education. The research question that guided this study was: What is the relationship between students' grades in Swedish at secondary level and their level of completion on five-year university programmes?

2. Method

This study is situated within the context of Swedish higher education and aimed to investigate the relationship between students' academic performance in Swedish language at the secondary school level and their subsequent degree completion in five-year university programmes. Specifically, the study addressed the research question: What is the relationship between students' grade in Swedish at the secondary level and their level of completion in five-year higher university programmes? This study seeks to understand how early language achievement may predict long-term academic persistence and success in higher education.

2.1 Data Sources and Sample

The Swedish Council for Higher Education (Universitets- och högskolerådet) and Ladok, Sweden's centralized student records system, two national-level administrative databases, were used to compile the dataset used for this study. These databases provide comprehensive, longitudinal records on admissions, enrolment, course registrations, academic performance, and degree completion across all higher education institutions in Sweden.

Data were extracted via structured SQL queries which resulted in 4 389 records with admissions to any of the various full-time five-year teacher certificate university programmes at the educational department between 2016–2024. To ensure the integrity of the dataset, the SQL queries were carefully constructed to retrieve consistent variables across time periods.

Records were cross-validated between the two sources to eliminate duplicates and resolve inconsistencies. Only students who had completed upper secondary education in Sweden were included. Students enrolled in part-time, non-degree teacher certificate, or bridging courses were excluded from the analytic sample in order to maintain consistency and comparability in terms of

academic trajectory and programme expectations. In cases of the same student with multiple registrations across separate semesters due to administrative issues, the earliest year was selected as non-excluded representation for a unique student, as all records from the same student were thanks to the prior cross-referencing vertically constructed in respect to the other attributes.
In total, N = 2 583 unique admitted students were included for analysis in this study.
All statistical analyses were conducted using IBM SPSS Statistics 29.0.0.0 (241). The primary method deemed as suitable to be used to address the research questions was standard multiple linear regression [16], [17]. Similar to other studies of dropout risk (e.g., [13]), the dependent variable—completion level—was regressed on the final grade in Swedish and the control variable in a single step model. Categorical variables were dummy coded for regression analysis. The primary analytical method employed was designed to estimate the independent effects of selected predictor variables on a continuous outcome variable of academic performance. Statistical significance was evaluated at the conventional alpha level of $p < 0.05$.

3. Results

In this section, results relating to the statistical analysis are presented.

3.1 Variables and Preparation

The primary independent variable was the students' final grade in Swedish at the upper secondary school level, based on the previous and current national grading scale (MVG–IG, and A–F, with MVG or A as the highest passing grade and IG or F as fail after attendance). Grades were numerically coded (A and MVG = 20, B = 17.5, C and VG = 15, D = 12.5, E and G = 10, IG, F, and no recorded course attendance = 0) to facilitate quantitative analysis.
The dependent variable was programme completion, operationalized into two groups as a binary outcome (1 = completed programme within a six-year time frame and finalized degree, allowing one additional year beyond nominal length; 0 = did not complete). Completion data were obtained directly from Ladok's degree reporting modules. The control variable was, with respect to parsimony, simply the admission year.
Initial data screening was conducted to check for incomplete records, and further inconsistencies across the two database sources. Descriptive analysis was used to examine distributions. The absence of data for students with completed programme during admission years 2022–2024 is a priori explained by the duration of the department programmes. Prior to model estimation, further outlier detection was conducted using Mahalanobis distance, calculated across the primary predictor variable.

3.2 Heuristic Examination with Descriptive Statistics

A preliminary inspection of the sample distribution reveals a clear pattern: students who did not attain a passing grade in Swedish at the upper secondary were only observed in the student group without programme completion compared to their peers who achieved passing grades. This trend is visually and numerically apparent, suggesting a strong initial association between secondary school language performance and progression through higher education. This is illustrated in Table 1.
Table 1. Descriptive statistics of grade distribution across students with finished programmes, compared to students without finished programmes.

		Grade						
		0	10	12,5	15	17,5	20	Total
Students	Completed programme	0	173	53	185	26	44	481
	Incompleted programme	509	697	187	460	72	177	2102
Total		509	870	240	645	98	221	2583

An initial heuristic examination of the distribution of Swedish grades across admission years reveals a temporal trend, indicating a progressive increase in the proportion of students attaining higher grades in more recent cohorts compared to earlier ones. The trend is illustrated in the corresponding descriptive statistics and visual summaries in Figure 1.

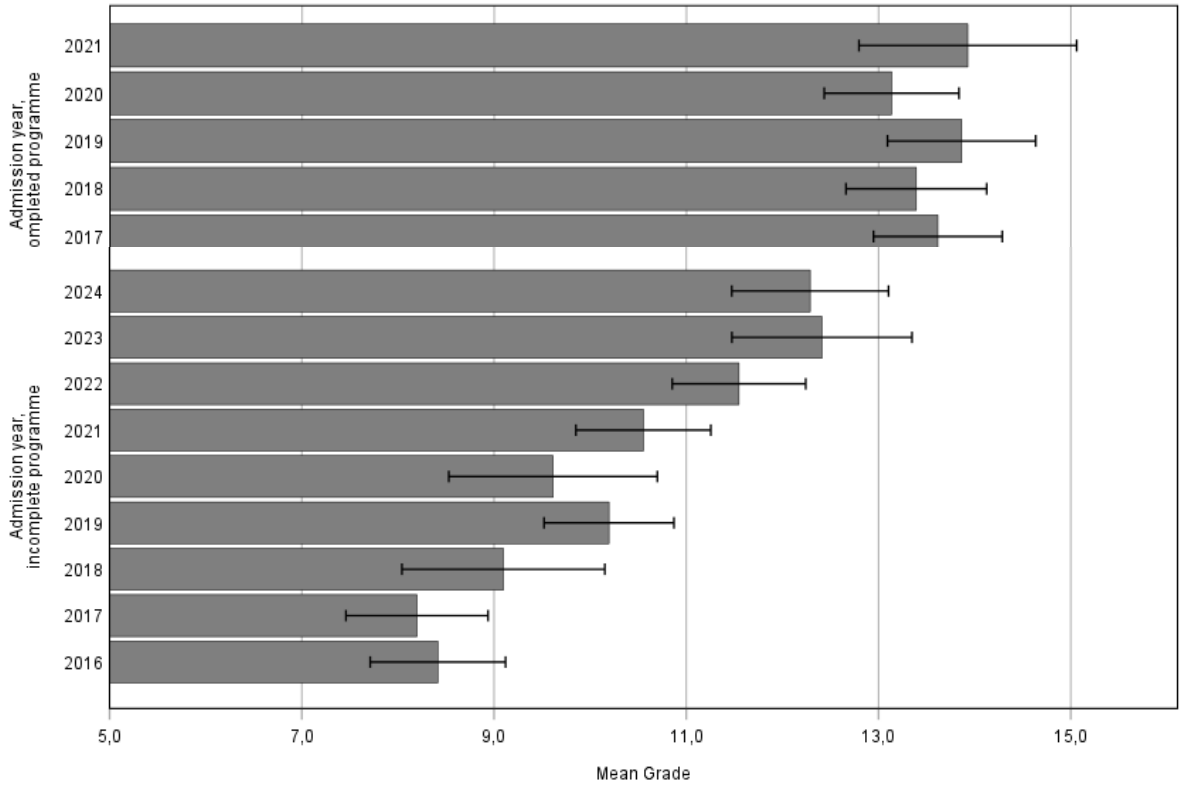

Fig. 1. Descriptive statistics of Swedish grades mean values with 95% confidence intervals across admission years and the dependent variable with student groups determining programme completion. The figure is structured to outline the group at the top with completed programmes, and the student group at the bottom to outline students with incomplete programmes.

The pattern of progressive increase of grades in the cohort with incompleted programmes suggests a potential grade inflation effect or an overall improvement in upper secondary academic performance over time. The trend seems consistent throughout multiple admission years, although the trend differs substantially when compared to the group with completed programmes.

3.3 Investigating Trends with Multiple Regression

In relation to the control variable of admission years, multiple regression analysis revealed a statistically significant positive association, $t(\beta) = 10.320$, $p < .001$, indicating robust evidence between later admission years and higher Swedish grades. Specifically, the unstandardized regression coefficient for admission year was 0.494, 95% CI [0.400:0.588] indicating that each successive year of admission (i.e., moving from an earlier to a later year) is associated with an average increase of 0.494-point in Swedish grade, holding all other variables constant.

The predictor that outlines two student groups that relate to the programme completion status also emerged as highly statistically significant, exhibiting a negative association: $t(\beta) = -14.311$, $p < .001$. Students who did not complete their programme, as coded in this variable, scored on average -4.341, 95% CI [-4.935:-3.746]. In other words, students without programme completetion had on average 4.34 points lower in Swedish at the secondary level compared to those who completed their programme, all else equal. This suggests that non-completion of higher education programmes is consistently linked with lower prior academic performance in Swedish at the secondary level.

The robustness of these findings is further supported by assessment of Mahalanobis distance [16]. Specifically, the distance ranged at 0.259–7.545 (M = 1.999, SD = 1.654). This indicates that a few data points may be multivariate outliers, especially those with values approaching or exceeding 7. However, a critical chi-square value at $p < .001$ is 13.82 for two predictors in this study, no observations exceed this threshold, suggesting the absence of extreme multivariate outliers among

the predictors [18]. This enhanced the overall validity of the model estimates and supports the stability of the regression coefficients.

4. Discussion

The aim of this study was to investigate the potential relationship between students' secondary school grades in their first language and their learning outcomes in university programmes for teacher certifications given in the same language at a department of education. The research question that guided this study was: What is the relationship between students' grades in Swedish at secondary level and their level of completion on five-year university programmes?

The findings of the study provide initial yet meaningful evidence that indicate that passing grades and higher grade levels resulted in a higher expectancy of university degree completion. There were indications of a strong association between secondary school language performance and progression through higher education. Here, the difference revealed by regression analysis was some two grade steps in current Swedish grading system, i. e. on average slightly below C in completed group and E in the students with incomplete university programme. A trend with higher grades in all admitted students in recent years compared to earlier was also observed. The context of the sample of this study contradicts notions in Swedish media discourse 2024–2025 of lower grades of all students that are admitted to higher education [14, 15]. The substantial performance gap aligns with initial hypothesis from literature review that language proficiency may be a critical component for humanities readiness, i.e. fields that emphasize extensive reading, writing, and conceptual engagement.

Thus, for students, language skills appear to be related to expected completion. Of interest is that the students in this study are accepted to the university programmes, i.e. they have the grades required for the programmes they have applied to. However, of further interest is that the knowledge levels that the students have in language, may nevertheless not be sufficient to complete the programmes. The findings in this study converge with the findings in [9], that students' grades in the last year(s) of upper secondary school have a correlation to students' performance at the university level. To mitigate the risk of reducing future career opportunities brought up in [8], the authors' recommendation is to reinforce language support both in upper secondary school and in higher education. In the same way as 'STEM readiness' can be achieved by reinforcing Math and English skills [19], 'Humanities readiness' could be strengthened by additional language training in mother tounge language and English.

From the perspective of university educations, the results of this study are of interest for university educators who work in supporting students to gain specific knowledge skills, as well as supporting language skills and academic skills. On the university level, the results of this study appear to show an increased need for overall student support for students in general in order to support students' language skills and academic skills as generic skills for expected programme completion. As a part of 21st century generic skills the preparation for humanities readiness could preferably also involve basic training on how to carry out university studies in online learning environments [20]. In the Swedish context a one-year preparation programme for STEM studies in higher education has been available since the early 1990s [21]. As suggested in a posting to a blog on higher education politics [22], the same concept for humanities may be beneficial could be a good idea.

4.1 Implications

The results have an impact on several levels as well as having potential consequences of restricting courses to certain grade level prerequisites, and considerations to necessary developmental factors of the students.

Furthermore, while much prior work has focused on second-language challenges among international students [3], [4], [12], the present findings demonstrate that language barriers also exist among domestic students, particularly those entering university with lower proficiency in academic Swedish. In this regard, first-language proficiency functions as a critical gatekeeper, influencing not only initial access to university but also the likelihood of degree completion. This supports the suggestion that language-focused preparatory interventions—common in international education—may also be beneficial for national student populations.

The following implications are of vital importance for benefit to several actors in the educational sector:

University educators acknowledge and continue to work to support students and student language skills.

Universities providing support for students' language learning and other academic study skills.

Professional development for university staff relating to this topic, such as specific interventions for university programme groups and work teams.
Informing educational stakeholders and policy makers of these challenges and the need to take action.

4.2 Limitations and further Research

The observed association between admission year and Swedish grade, though positive and statistically significant, warrants a nuanced interpretation. The modest unstandardized increase of 0.494 grade points per admission year suggests that more recent cohorts have, on average, entered higher education with stronger language grades. This could reflect changes in upper-secondary curricula, shifts in grading practices, or broader educational reforms. However, this is solely based on two predictors—admission year and programme completion—and as such have limitations in capturing the complex factors influencing academic performance and persistence.
The limited explanatory power brought on by the few number of predictors highlights the multifaceted nature of academic success, echoing prior research from STEM education, where domain-specific readiness—such as mathematical or scientific proficiency—has been shown to influence persistence and degree completion [1], [9], [10]. As emphasized by Arnbjörnsdóttir and Prinz [11], humanities students similarly require a form of “Humanities readiness,” characterized by strong first language literacy and academic writing competence. The results of this study lend empirical support to this parallel, underscoring that students lacking sufficient proficiency in their first language may struggle to meet the demands of higher education, even in national-language instruction settings. However, more predictors and repeated measures need to account for the larger variance for this kind of analysis.
Future studies should therefore focus on continued statistical studies on expected course completion, and the relation between students’ accepted grades and completion. Other studies could conduct interviews with students and university educators to supplement statistics further in a mixed-method approach to investigate the learning outcomes more in-depth. Furthermore, it would be interesting to select some courses with language intensive activities and low pass rates for the qualitative part of a mixed method study.

4.3 Summary

While robust and statistically valid, the modest predictive power of the current model presented in this paper, which is correlational in nature, further suggests that additional factors—such as student motivation, socio-economic background, academic self-efficacy, and institutional support—should be included in future educational research of learning outcomes with multifactorial and mixed-method approaches to better understand the full landscape of degree completion.
In the light of the findings from regression analysis, the authors of this paper concur with the notion of a one-year preparation programme for students in the humanities that aim for a university degree, similar to many educational practices in STEM [21]. The findings of this study further invite a broader rethinking of readiness models in higher education. Just as STEM readiness encompasses subject-specific competencies and self-efficacy [10], humanities readiness may involve language skills, critical reading, and academic writing confidence—all of which merit greater attention in admission practices and student support services.

REFERENCES

[1] Deeken C, Neumann I, Heinze A. Mathematical prerequisites for STEM programs: What do university instructors expect from new STEM undergraduates?. International Journal of Research in Undergraduate Mathematics Education. 2020 Apr;6(1):23-41.
[2] Geller BD, Gouvea J, Dreyfus BW, Sawtelle V, Turpen C, Redish EF. Bridging the gaps: How students seek disciplinary coherence in introductory physics for life science. Physical Review Physics Education Research. 2019 Dec 1;15(2):020142.
[3] Rose H, Curle S, Aizawa I, Thompson G. What drives success in English medium taught courses? The interplay between language proficiency, academic skills, and motivation. Studies in Higher Education. 2020 Nov 1;45(11):2149-61.
[4] Guo PJ. Non-native english speakers learning computer programming: Barriers, desires, and design opportunities. InProceedings of the 2018 CHI conference on human factors in computing systems 2018 Apr 21 (pp. 1-14).

[5] Jintapitak M, Chakpitak N, Sureepong P, Chaipravat O. Learning environment management for total language immersion in the classroom: A case study of Thai education development. Advanced Science Letters. 2017 Jan 1;23(1):87-91.
[6] Hashim H, Rafiq KR. Reviewing ESL roles in STEM education: Scaffolding stem learners' English language competency. International Journal of Academic Research in Business and Social Sciences. 2022;12(6):86-101.
[7] Tytarenko A, Revenko VV, Matsepura LL, Panasiuk YV. STEAM approach to the development of English language skills in future teachers. JETT. 2021;12(3):155-64.
[8] Apple MT, Falout J, Hill G. The relationship between future career self images and English achievement test scores of Japanese STEM students. IEEE Transactions on Professional Communication. 2020 Nov 12;63(4):372-85.
[9] Card D, Payne AA. High school choices and the gender gap in STEM. Economic Inquiry. 2021 Jan;59(1):9-28.
[10] Kurban ER, Cabrera AF. Building readiness and intention towards STEM fields of study: using HSLS: 09 and SEM to examine this complex process among high school students. The Journal of Higher Education. 2020 Jun 6;91(4):620-50.
[11] Arnbjörnsdóttir B, Prinz P. From EFL to EMI: Developing writing skills for the humanities. Journal of English for Specific Purposes at Tertiary Level. 2017 Dec 1;5(2):172-95.
[12] Sun S, Davison C. University Preparation Programs in Australia: International Student Perspectives. SAGE Open. 2023 Jun;13(2):21582440231181304.
[13] Singh, H. P., & Alhulail, H. N. (2022). Predicting student-teachers dropout risk and early identification: A four-step logistic regression approach. IEEE Access, 10, 6470-6482.
[14] Jinneklint, A. (2025, April 24) Höj antagningskraven till högskolan. Universitetsläraren. https://universitetslararen.se/2025/04/24/hoj-antagningskraven-till-hogskolan/?utm_campaign=UL9_24apr_25&utm_content=UL9_24apr_25&utm_medium=email&utm_source=apsis-anp-3/
[15] Nya siffror: Sämsta betygen i svenska på över tio år. (n.d.-b). Ämnesläraren – Svenska, SO, Språk. https://www.vilarare.se/amneslararen-svenska-sprak/betyg/nya-siffror-samsta-betygen-i-svenska-pa-over-tio-ar/
[16] L. Cohen, L. Manion, & K. Morrison (2018), Research methods in education, 8th ed. Abingdon: Routledge.
[17] S. L. T. McGregor (2018), Understanding and Evaluating Research: A Critical Guide. Sage Publications.
[18] J. P. Marques de Sá (2020), Applied Statistics: Using SPSS, STATISTICA, MATLAB and R, vol. 2.
[19] N. M. Moleta & A. R. Yango. "Schools' Readiness, Teachers' Proficiency, and Science Technology Engineering and Mathematics (STEM) Students' Preparedness for Higher Education." Technium Soc. Sci. J. 44 (2023): 145.
[20] V. Tkachenko, et al. "An evaluation of Ukrainian future teachers' of humanities readiness for e-education." Revista Brasileira De Educação Do Campo 6 (2021): e11577-e11577.
[21] Bryntesson, Per-Viktor, Tom Cederborg Wincent, and Per Fagrell. "Varför finns basår?." 5: e Utvecklingskonferensen för Sveriges ingenjörsutbildningar, Uppsala universitet, 18–19 november 2015. 2015.
[22] M. Demker. "Världen efter pandemin kommer att behöva humaniora" ("The post-pandemic world will need humanities") Accessed 14/05/2025 from: https://hogskolepolitik.blog/2021/04/06/varlden-efter-pandemin-kommer-att-behova-humaniora/