PROFILING STUDENT BASED ON ACADEMIC PERFORMANCE: IDENTIFYING KEY CHARACTERISTICS IN AN ONLINE LEARNING ENVIRONMENT

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Abstract

In the context of online education where interactions between learners and teachers are mediated through a learning management system, understanding the diverse profiles of students is crucial for improving academic outcomes and designing effective learning interventions. This study aims to identify key characteristics of students based on their academic performance within the English Language Education Study Program (ELSP) at Universitas Terbuka. It explores how students can be classified into distinct groups according to their performance in a core course within the study program. An online cross sectional survey was done to gather data on demographic, professional, and behavioral factors, such as teaching experience, digital readiness, learning styles, readiness for independent learning, as well as level of English Proficiency (EP) of the students. A sample of 20 in-service teacher students were found to meet the criteria to be included in further analyses. These students were grouped into two performance categories (High Achievers and Low Achievers) based on their scores in the Teaching English as a Foreign Language (TEFL) course, one of the core courses that was delivered in the English language. Descriptive statistics were employed to identify common characteristics that can be used to profile these groups. The most notable finding in terms of academic performance was the relationship between English proficiency (EP) and academic performance (course grades). High achievers tended to have higher EP scores, suggesting that students with stronger language skills are better equipped to handle the demands of the TEFL course. However, students in the middle EP range (A2 to B1) showed more variability in their grades, indicating that other factors such as motivation, study strategies, and digital readiness may also play important roles in determining academic outcomes. These findings offer valuable initial insights into the characteristics that may influence students' achievement in the course, providing educators and administrators with information that can be utilized to enhance support mechanisms and tailor instructional strategies. Although based on a limited sample size, but the characteristic patterns found can add meanings to the growing body of knowledge on online education and student profiling, highlighting key factors that need to be considered to promote academic success in distance learning environments.

Keywords: Student Profiling, Academic Performance, English Language Education, Online Learning, Distance Education

1 INTRODUCTION

The transition to online learning has underscored the need to understand student diversity within virtual classrooms, particularly in programs like those offered by Universitas Terbuka's English Language Education Study Program (ELSP). Currently, the absence of a system that can adequate collect information at the necessary junctures that is pertinent to successful learning has led to the provision of a standardized online learning experience, treating all enrolled in-service student teachers uniformly. Such an approach neglects the inherent diversity among these students, posing challenges to the optimization of their learning experiences. The standardized approach also often lacks personalization, potentially affecting outcomes for students with varying levels of English language proficiency and learning readiness (Loeb et al., 2017; Seaman et al., 2018). This lack of attention to student individuality gives rise to significant challenges not only for students and educators, but also for administrators. The provision of uniform learning experiences may fall short in effectively addressing the diverse needs, strengths, and challenges that the students experience during their academic journey.

Consequently, this oversight may lead to dissatisfaction and disengagement, hindering overall academic progress. The identified problem of lacking comprehensive student profiling serves as a barrier to achieving optimal learning outcomes. Through the implementation of a profiling system, the end objective is to tailor instructional strategies, materials, and support services to the specific needs and preferences of each student. This individualized approach is fundamental to overcoming existing challenges and cultivating a more engaging and effective learning environment.

This study attempted to collect the information needed to identify key characteristics of ELSP students that can explain their academic performance and thus be used to profile them. The key questions that needed to be answered are two folds: 1). what is the profile of the students enrolled in the ELSP, 2) what are the defining characteristics of the students with good and those with poor academic performance? The findings of this study also provided information on the feasibility of establishing an online profiling system that enables the collection of these characteristic measures which are essential for success in an online, English-medium course.

2 METHODOLOGY

The effort to establish a comprehensive database on students, aside from the existing data stored in the Student Record System (SRS) managed by the Registrar Office and the assessment data

managed by the Centre for Testing, and combining them with the data gathered on the student characteristics, has never before tried by any unit of the university. The ELSP student body in 2024.2 semester is 1602 in-service student teachers. These students are scattered across 15 regions in Indonesia. As in other open and distance learning institutions, gaining direct access to students can prove to be quite a challenge and it was anticipated that less that 50% can be reached to participate in this study. Thus, careful consideration on selecting the most appropriate and relevant method need to be done.

2.1 Study design

This study used a mixed-method approach, combining quantitative descriptive statistics and qualitative analyses to construct a preliminary profile of ELSP students based on their academic performance in a course. A decision was made to collect data to as many students as possible and analyze the data for students that have enrolled in the online Teaching English as a Foreign Language (TEFL) course. This course was chosen as it is one of the pedagogy courses that uses English in the learning materials and online tutorial, thus enabling the confirmation of whether certain factors such as teaching experience and English proficiency indeed played an important part in how student perform academically. A cross-sectional survey was carried out using an online questionnaire to collect student demographic information with links to three existing external instruments that measures the characteritics variable, i.e. student learning style, learning self-regulation, and English language proficiency.

2.2 Population and sample

A purposive sampling technic was used to determine the sample using the criteria of having all valid survey data points and have taken the TEFL I (PBIS4402) course through the e-learning platform. Given the importance of English proficiency for course success, this purposive sample was selected to capture students with diverse academic performance within this English-medium course. The final sample consisted of 20 students which are then divided into two groups based on their academic performance, as indicated by their final grades in the course:

- **Group 1 – High Achievers (HA)**: Students scoring above 59.7, who do not require remedial support and considered to have performed sufficiently in the course.
- **Group 2 – Low Achievers (LA)**: Students scoring below 50.2, identified as needing intervention probably due to the current instructional strategies implemented in the learning process and/or environmental factors.

The sample represents students from 15 different regions across Indonesia, reflecting the geographic diversity within Universitas Terbuka's student population.

2.3 Instruments

The survey used multiple instruments to collect information on students' demographics as well as behavior patterns. The survey instrument uses google form which was validated by experts in the field of English Language Teaching and in distance educational, to ensure readability, relevance, and accuracy in profiling student characteristics:

1. **Learning Style (LST) and Independent Learning (IDL) Instruments**: These were adapted from existing instruments used by Universitas Terbuka, initially designed for new students but not previously recorded in the system. In this study, the instruments were incorporated into the online survey, enabling the systematic collection of learning style and independent learning data.
2. **English Proficiency (EP) Test**: Recognizing the significance of language proficiency for an English-medium course, participants received a link to a 15-minute English test by English First (EF). This test was chosen since the obtained score could be aligned with the Common European Framework of Reference for Languages (CEFR), providing a standardized measure of students' English proficiency levels.
3. **Demographic Survey Questionnaire**: As environmental and demographics factors have been founded to affect learning in an online environment, information on gender, age, region, education, work, and teaching experience were collected.
4. **Digital Readiness (DIG) Questions**: There were seven digital readiness indicators embeded in the main survey instrument but only three were used for anlyses in this study. The relevant information gathered was on type of digital devices (DIG1), internet access (DIG2), and usage duration (DIG3).

To reach the target audience effectively, the survey was distributed through 39 official study program student chat groups managed by the English Language Education Study Program, Universitas Terbuka. To maximize participation, the survey link was shared three times at two-week intervals, ceasing after no additional responses were received. This survey distribution approach ensured broad access and encouraged participation among diverse students across multiple regions.

2.4 Data analysis

For analyzing the patterns among the student sample, examination of communalities was accomplished through pattern identification and thematic analysis. With a sample of only 20 students, the goal was to determine dominant characteristics that highlight differences in readiness for independent learning, digital readiness, learning style, and English proficiency between high-achievers (HA) and low-achievers (LA).

The collected data was thoroughly cleaned prior to codification of responses. No outliers were found but there were missing data that were then treated with insertion of mean or mode of the group responses on the particular variables. A manual coding approach utilizing pattern visualization technic (eyeballing patterns) was used for analyzing the characteristic variables. Recurring themes or patterns of responses that appear frequently within each group (HA and LA) were gathered. This visual inspection of responses aimed at revealing trends, similarities, and contrasts within the groups. Research by Miles and Huberman (1994) on qualitative data analysis emphasizes matrix and data displays to facilitate pattern recognition. Using matrices, the pattern of responses between HA and LA groups for each characteristic variable were compared. This comparison helped reveal key attributes that differentiate high performers from low performers, following techniques described in the constant comparative method by Glaser and Strauss (1967). The findings were then summarized by connecting the identified patterns to the research question and used to illustrate which characteristics are most prevalent among HA and LA students, effectively highlighting the dominant characteristics in each group. This combined descriptive analysis and pattern visualization approach aligns with research emphasizing both quantitative clarity and qualitative depth in understanding student profiles (ERIC, 2017).

3 FINDINGS AND DISCUSSIONS

The results of the study and discussion of the key findings are organized according to the four variables chosen to identify key characteristics of students in an online learning environment. To address the first research question on what is the profile of the ELSP students, the demographic responses for the groups were analized.

3.1 Students Common Characteristics

Based on the information gathered it was found that for the total sample 70 percent of the students are female and males make up for 30 percent. In group HA, there are 8 females and 2

males, while in the LA group there are 6 females and 4 males. The general decsription of these sample students can be seen in Table 1.

Table 1 – Characteristics of Students Enrolled in the TEFL 1 Course

Variable	**Group 1 (HA)**			**Group 2 (LA)**			**All Groups**	
AGE (yrs)	n = 10			n = 10			n = 20	
Gen X	44-59	2	10%		2	0%	2	5%
Millennials	28-43	3	50%		3	40%	3	45%
Gen Z	12-27	4	40%		4	60%	4	50%
	Range:		22 - 46	Range:		21 - 37	Range	21 - 46
	Mean:		29.4	Mean:		27.8	Mean	28.6
GENDER	Male	2	20%	Male	4	40%	Male	30%
	Female	8	80%	Female	6	60%	Female	70%
EDUCATION	S1	2	30%		0	0%		70%
	D3	3	30%		0	0%		15%
	SMTA	4	40%		10	100%		15%
TEACH EXP (yrs)	Mean:		5.8	Mean:		4.5	Mean:	5.15
	Range:		1 - 15	Range:		2 - 8	Range:	1 - 15

The findings from the analyses of the demo graphic variables suggest some interesting patterns that may that might explain differences in students' academic performance. Looking at the age variable it is founded that for group HA the range is 22–46 years, with a mean of 29.4 years. The most frequent age category is 3 for Millennials (50%), followed by 4 for Gen Z (40%). For group LA, the age range is 21–37 years, with a mean of 27.8 years, and the most frequent age is 4 for Gen Z (60%), followed by 3 for Millennials (40%). For the total group, the age range is 21–46 years, with a mean of 28.6 years. The mean age difference between Group HA and Group LA is 1.6 years, not large enough to suggest that age alone is a strong determinant of academic performance. However, a slightly older mean age in Group HA could indicate more experience or maturity, which may influence academic outcomes, particularly in terms of cognitive development and learning strategies.

In terms of gender, there is a higher proportion of females in Group HA (80%) compared to Group LA (60%). This could reflect gender differences in academic performance or how the

groups were sampled. However, the gender distribution is not extreme enough to suggest a major influence on academic performance within the sample as a whole.

After taking a careful look at the education level of the samples, it was founded that Group LA is entirely composed of students with high school education (lower education level), whereas Group HA has a more diverse distribution, with some having undergraduate or college education. This suggests that Group HA likely has students with higher educational backgrounds or more advanced qualifications, which could directly impact their academic performance and their ability to succeed in the TEFL 1 course. The dominance of high school education in Group LA may reflect students with less advanced educational foundations, which could be a significant barrier to their academic success, contributing to their lower grades.

As the ELSP is for in-service teachers, analysing whether prior teaching experience plays a role in the success of students taking the TEFL 1, an English pedagogy course was explored. Group HA has more teaching experience on average (5.8 years) than Group LA (4.5 years), though the difference is relatively small. Higher teaching experience could be indicative of more seasoned or skilled educators, which may affect how effectively they teach their students. However, the range of teaching experience is quite wide in both groups, so this is not likely to be a determining factor on its own.

3.2 English Proficiency

The distribution of the English Proficiency (EP) score for the entire sample group can be seen in Figure 1. Most of the students' English skills fall into the A2 Elementary level (33.3%). Most participants (10 out of 20) which is 50% have EP at the A2 and B1 CEFR levels, representing foundational to intermediate proficiency. This concentration suggests that while some participants have strong language skills (B2 and above), the majority are still developing their foundational proficiency.

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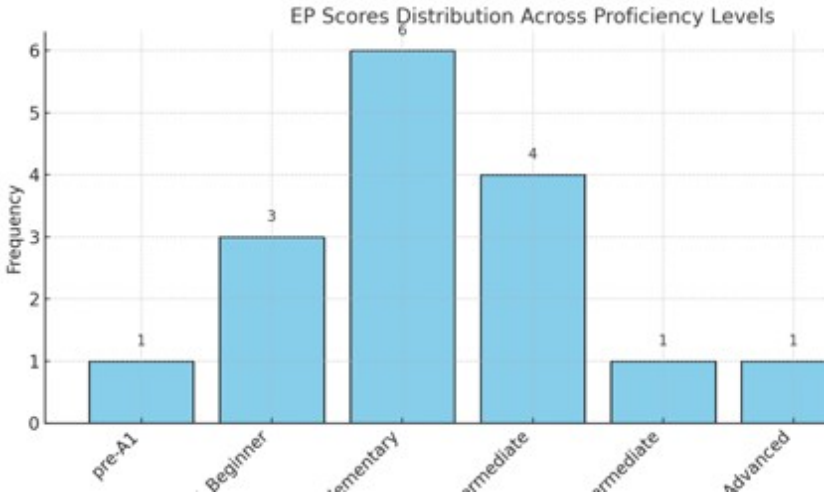

Figure 1.

The data on students' English Proficiency (EP) scores by academic performance (grades) can be seen in Appendix 1 and shows that the scores are distributed across several proficiency levels, ranging from pre-A1 (beginner) to C2 (proficient). The majority of students are concentrated at the A2 (Elementary) and B1 (Intermediate) levels, with frequencies of 6 and 4 students, respectively. Lower numbers are observed at the pre-A1, A1, C1, and C2 levels, indicating that a smaller proportion of students fall within either the highest or lowest proficiency levels.

The course grades vary widely among students with different English proficiency scores. A preliminary visual inspection reveals that students with higher EP scores generally tend to perform better in the course, although this trend is not absolute. Students with EP scores in the upper ranges (e.g., EP scores of 85 and 90) generally achieved grades above 60. Students in the mid-range EP scores (e.g., 50–75) show more variability in their grades, with scores ranging from 36 to 65.7. However, students with lower EP scores (e.g., 10–40) frequently have course grades below 50, with only a few exceptions.

When the students are divided into high achievers (HA) and low achievers (LA) based on their course grades, patterns emerge regarding English proficiency. It was observed that the HA students in this tend to have EP scores clustered around the upper proficiency levels (B1 Intermediate and above). They also show a greater concentration in the C2 Proficient category. The LA group mostly includes students with EP scores below B1, with a concentration at A2 Elementary or lower suggesting that higher English proficiency may be associated with better academic performance.

The findings indicate a potential relationship between English proficiency levels and academic performance, as measured by course grades in TEFL 1. Specifically, students with higher EP scores (B1 Intermediate and above) are more likely to be high achievers, while those with lower EP scores tend to fall into the low-achiever group. Another observed pattern is the greater variability in course grades among students in the middle range of EP scores (A2 to B1). This suggests that while higher proficiency may contribute to academic success, mid-range proficiency may require additional factors (e.g., learning strategies, motivation) to consistently translate into high achievement. This positive association between higher EP scores and better course grades aligns with previous research that highlights English proficiency as a critical factor in academic success for students in English-medium or language-dependent courses (Martirosyan et al., 2015).

3.3 Learning Styles

Visual patterns from the responses given by the students pertaining to their learning styles provided some interesting findings. The majority of high-achieving students were found to prefer an auditory learning style. This preference aligns with the LMS content's heavy reliance on video materials, such as the YouTube links provided in the TEFL1 course. These auditory resources cater to students who learn best through listening, supporting their engagement and achievement. It was also founded that students with higher grades tend to have more frequent internet access and better learning equipment, like laptops and computers, as opposed to just smartphones (see Appendix 2). This suggests that beyond learning style, the quality and frequency of access to digital resources are significant contributors to student success.

To better understand whether the learning experience provided through the LMS has taken consideration of different learning styles, the learning content of the LMS was looked into. While the LMS appears well-suited for auditory learners, students who favor visual, kinesthetic, or a combination of styles may find limited engagement options. Although there is visual material in video form, there is less emphasis on interactive or hands-on elements that would better serve kinesthetic learners. The need for stable internet access and suitable devices to fully benefit from the auditory-heavy LMS content poses a challenge for low-achieving students. This technological gap suggests that even if a student's preferred learning style aligns with the LMS, insufficient access can hinder their ability to engage fully and perform well.

Overall, the LMS content for the TEFL1 class moderately caters to auditory learners but may not adequately support other learning styles or students facing technological constraints. This

finding highlights the importance of incorporating more diverse, multimodal resources in LMS design to address various learning preferences and accessibility issues.

3.4 Digital Readiness

Students' digital readiness was measured using seven indicators. However, in this study only three that pertains to device type (DG1), accessability (DG2), and usage duration (DG3) was chosen to be analyzed. Looking at how student access the internet it was founded that of the students with high academic scores, 100 percent reported having internet access at home. In contrast, only 60 percent of students with low scores had internet access at home. This suggests that home internet access is more common among high-performing students, though it is also available to a portion of low-performing students. Another pertinent aspect to look for pattern is the amount of time they claimed to spend on the internet. For students with high scores, 50 percent (5 out of 10) used the internet for more than 5 hours per day. In the low-performing group, 60 percent (6 out of 10) accessed the internet for similar durations. Of these 6 students, 5 used the internet for more than 5 hours per day, while 1 used it for 3-5 hours daily. This finding indicates that prolonged internet usage (over 5 hours per day) does not automatically correlate with higher academic performance.

These findings align with previous studies that highlight the multifaceted nature of internet usage and academic performance. While access to technology, such as internet availability at home, is essential, it does not necessarily guarantee improved academic outcomes (Rashid, 2016). The data here show that merely having internet access or spending long hours online does not lead to academic success; instead, how students utilize this access is more influential.

The influence of educational background suggests that students with prior college experience are better equipped to leverage the internet for academic success. This aligns with findings by Zimmerman et al. (2017), who argue that a higher level of educational experience cultivates self-regulated learning and critical thinking skills, enabling students to use digital resources more effectively. This skill set appears to be lacking in students with only high school education, who may not yet possess the same level of academic discipline or focus in their internet use.

In contrast, demographic factors like gender, prior teaching experience, and general internet activities (such as browsing or social media use) did not significantly impact academic performance. This suggests that specific background factors, particularly educational

background and focused internet use for academic purposes, play a more critical role in academic achievement than general access or usage metrics.

3.5 Readiness for Independent Learning

Student readiness for independent learning (INL) was analyzed and patterns of responses were observed that may explain their academic performance or course grades. Higher achievers tend to have above average to high readiness for independent learning. These categories are associated with individuals who are more likely to be self-directed and capable of taking charge of their own learning processes. There is a clear pattern that higher readiness correlates with better academic performance in the TEFL 1 course. These individuals are likely to be more self-directed in their learning, leading to stronger academic or cognitive outcomes.

Lower achievers generally have below average to average readiness for independent learning. These individuals may need more support or structure in their learning environments to succeed. These individuals show a need for more guidance and may not be ready to take on independent learning tasks. Lower readiness for independent learning correlates with lower course grades. This suggests that individuals in this group may struggle with self-directed learning, which may contribute to their lower performance in the course.

Independent learning readiness, as indicated by higher INL scores, is a significant factor in determining performance in the TEFL 1 course. This suggests that individuals who are more self-sufficient in their learning process may be better equipped to handle challenges and perform well in academic assessments.

4 CONCLUSION

This study highlights key factors that contribute to the academic performance of students enrolled in an online English-medium course (TEFL 1) offered by the English Language Study Programs at Universitas Terbuka. By profiling students based on their demographic characteristics, educational backgrounds, teaching experience, and learning styles, the study offers valuable insights into differentiating high achievers (Group HA) from low achievers (Group LA).

From the findings it can be concluded that educational background plays an important role in academic performance. Group HA students with higher educational qualifications (S1 or D3), demonstrate a stronger academic foundation, which likely contributes to their higher grades in the TEFL 1 course. Conversely, Group LA students with predominantly high school

qualifications (SMTA), face challenges stemming from less advanced academic experience. This disparity underscores the importance of prior educational exposure in shaping students' ability to succeed in academic courses, particularly in language learning contexts.

In addition to educational background, teaching experience was another contributing factor, though its influence is more subtle. Group HA had slightly more teaching experience on average when compared to Group LA, which may enhance their ability to engage with course materials and navigate the demands of an online learning environment. However, given the relatively small difference in teaching experience between the two groups, teaching experience alone is not a major determinant of academic success.

Age and gender were also considered as potential factors affecting performance, but their impact was found to be minimal. While Group HA was slightly older on average, this difference was not able to explain the performance gap. Similarly, gender distribution, with a higher proportion of females in Group HA, did not emerge as a significant variable influencing academic outcomes in this sample.

The most notable finding in terms of academic performance was the relationship between English proficiency (EP) and course grades. High achievers in Group HA tended to have higher EP scores (B1 Intermediate and above), suggesting that students with stronger language skills are better equipped to handle the demands of the TEFL 1 course. This aligns with previous research that found language proficiency played an important role in academic success (Martirosyan et al., 2015). However, students in the middle EP range (A2 to B1) showed more variability in their grades, indicating that other factors such as motivation, study strategies, and digital readiness may also play important roles in determining academic outcomes.

Learning styles were also explored, with auditory learners more prevalent in Group HA. This aligns with the design of the course LMS, which heavily relies on auditory materials (e.g., YouTube videos), catering to students who learn best through listening. However, the course content was less accommodating for kinesthetic or visual learners, which may limit engagement for students whose learning preferences are not fully addressed. This highlights the importance of multimodal learning approaches in online courses to ensure that all students have access to materials that match their learning styles.

Despite the valuable insights provided, this study has several limitations. First, the sample size is relatively small, with only 10 students in each group. A larger sample size would allow for more robust generalizations and improve the reliability of the findings. Additionally, the study

relies on data from only one course (TEFL 1), which limits the ability to draw conclusions about the generalizability of the results across different academic programs. It is possible that factors influencing student success may vary depending on the subject area or the specific demands of other courses.

Moreover, the study does not explore potential longitudinal effects or the impact of interventions over time. This restricts our understanding of how changes in the learning environment (e.g., through targeted support programs or digital literacy training) might influence academic outcomes.

Taking into considerations the above limitation of this study, future research should consider larger, more diverse samples to better capture the variability in academic performance across different student populations. Including students from various academic disciplines would help determine whether the patterns observed in this study hold true across other fields of study. Studies that could track students' progress over multiple semesters to identify how changes in factors such as teaching experience, educational background, or digital readiness impact academic performance over time would also prove to be fruitful. This would provide more insights into the causal relationships between these variables and their long-term effects on learning outcomes. Given the important role of independent learning readiness in academic success, future studies could investigate how self-regulated learning skills (e.g., goal setting, time management, metacognitive strategies) influence academic performance in online learning environments. Studies by Zimmerman et al. (2017) have emphasized the importance of self-regulation for academic success, especially in digital learning contexts. To understand how specific factors such as digital literacy, learning strategies, or online engagement impact academic success, intervention-based studies could be conducted. For example, students with limited digital readiness could be provided with training on effective internet use and academic research skills to assess whether such interventions improve their academic performance. Other future researchers should explore how online courses can be designed to better accommodate multimodal learning styles, offering a broader range of materials (e.g., interactive activities, visual aids, kinesthetic exercises) to support diverse learners. Research by Sung et al. (2017) has demonstrated that multimodal learning environments can enhance engagement and improve learning outcomes for students with varying preferences.

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APPENDIX 1

Academic Performance by English Proficiency

ID	PBIS4402 Final Grades	Achievement Group	EP Scores	CEFR EP Levels
043534148	85.0	High-achiever	60	B2
043438727	81.0	High-achiever	85	C2
050243472	70.0	High-achiever	35	A2
052284892	65.7	High-achiever	50	B1
043640233	62.5	High-achiever	75	C2
048999377	61.6	High-achiever	90	C2
044420953	61.2	High-achiever	65	C1
022433372	60.2	High-achiever	30	A1
048603579	60.0	High-achiever	50	B1
044924023	59.7	High-achiever	40	A2
044133455	49.1	Low-achiever	45	B1
041952579	45.7	Low-achiever	40	A2
043578339	43.9	Low-achiever	40	A2
043183511	43.0	Low-achiever	35	A2
044233855	36.0	Low-achiever	75	C2
045285032	28.0	Low-achiever	45	B1
050507361	26.0	Low-achiever	35	A2
045032357	49.4	Low-achiever	30	A1
048288939	48.6	Low-achiever	25	A1
048794678	50.1	Low-achiever	10	Pre-A1