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Grade inflation effects of capacity expansion in higher education: a longitudinal study in undergraduate teacher education programs from 2003 to 2022

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This study examined the change in the rate of graduates with high honors (>3.50) in teacher training programs and the factors affecting grade inflation and graduation GPAs over a 20-year period. In the study, the weighted grade point average of 173,232 student-teachers who had graduated from 32 teacher training institutions between 2003 and 2022 was analyzed using the random effects estimator, ANOVA, *t* test, and ANCOVA. The findings suggest that their grade point averages increased from 2.83 to 3.34 within this period. The highest-grade averages were found in 2012, when the number of teacher training institutions was expanded; as well as in 2021–2022, during the COVID-19 pandemic. In addition, the gender of the students, their university admission scores, the teaching field, the establishment year of the program, and the ratio of students per faculty member were found to be important determinants of graduation GPAs. Based on our results, it can be argued that the rapid growth of teacher training programs in Türkiye has caused a decrease in quality, which has triggered an increase in grade averages. One of the most important findings supporting this idea is that programs with lower university admission scores have more students graduating with honors.

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Introduction

The number of higher education institutions has substantially increased in Türkiye in recent years. According to the statistics, there are 205 universities, with 7 million students, as well as nearly 200,000 lecturers. This makes Türkiye's higher education system one of the largest in Europe (YÖK, 2023), ranking first among OECD countries, with university students comprising 10% of the nation's population. In comparison, the per-capita university enrollment rate is 6% in the USA and 3.7% in Germany. Due to intensive growth in the past 20 years, a total of 128 of the existing 205 universities were founded after 2006. Moreover, in addition to this growth in the number of new higher education institutions, significant increases took place in both the number of programs and numbers of students enrolled in existing universities. This situation has brought about two main arguments in academic circles: (i) on the one hand, it is believed that this expansion increase the number of skilled individuals and lead to regional development in the country, whereas (ii) on the other hand, it is difficult to maintain the quality of education under the circumstances. In this regard, the physical limitations of the newly established universities, insufficient numbers of faculty members and rapid privatization in higher education have been criticized by academics, politicians, and other stakeholders. Nevertheless, the expansion policies have been encouraged by the public and the government due to difficulties in gaining admission to universities prior to 2006. To illustrate, while the number of students attending undergraduate programs in 1999 was 664,000, this number increased to a total of 3,700,000 in 2023. A similar situation has been seen in the number of students admitted annually to university programs, with 147,000 in 1999, and 457,000 in 2022.

This study addresses this situation with respect to teacher training programs, in particular, where the issue becomes much more complex. Namely, in line with a high demand for qualified teachers, a field which generally has high employment rates, it is striking that there has been an extreme increase in the number of teacher training programs, as well as the number of students attending these programs. While there were 48 faculties of education until the beginning of the 2000s, there are today a total of 99; with a parallel increase in the number of students, from 139,000 in the 2000s to over 300,000 today. The number of programs in the existing education faculties has likewise increased. For example, while the number of primary education mathematics teaching programs was 19 in 2000, it increased to 31 in 2006, and to 84 by the present day. This situation has accordingly led to a significant increase in the number of teachers. This development, which may be considered positive at the first evaluation, has given rise to two main problems: (i) in Türkiye, a total of 93% of all teachers are employed in public schools. However, of the number of unemployed teachers has been rising, as the number of teaching positions has lagged behind the existing capacity of the teacher training programs, and subsequently, the increase in the number of graduates; and (ii) the skill level of newly graduated teachers often fails to meet the desired levels. This is exacerbated by the fact that lower-achieving students are being accepted to education faculties (whereas higher achieving students tend to prefer fields such as medicine and engineering due to the increase in student capacity). Furthermore, the increase in the number of faculty members has not matched the increase in the number of students. Further factors that lead to concerns about the quality of teacher candidates include limitations in terms of library resources, dormitory capacity and social areas. A question appears at this point: How do these negative conditions affect the academic achievement of students? Has there been any increase in the academic achievement of students? To find answers to these questions, our study examined

grade inflation in the context of teacher education programs and rapid university enrollment. In this regard, grade inflation is not a problem limited to a specific discipline. However, there are few studies on grade inflation in other disciplines, and particularly in the area of teacher education. Based on the need to examine whether this issue exists in the context of teacher training, as well as what the consequences are, if any, the focus of this study is the change in the rate of graduates with high honors (>3.59) in teacher training in Türkiye, indicating the occurrence of grade inflation. The study also deals with the factors that affect graduate GPAs. In line with this aim, the study investigates the following research questions:

- (RQ1) Has the number of individuals graduating from teacher training programs with “higher honors or honors changed over the years?
- (RQ2) Does grade inflation exist in teacher training programs?
- (RQ3) Do student genders, admission scores, teaching field, year of program establishment, or student-faculty ratios affect graduation GPAs, potentially contributing to grade inflation?

Our data consist of the GPAs of 173,232 graduates from 32 teacher training programs over a 20-year period (2003–2022).

Very few studies have previously investigated the occurrence of grade inflation in teacher training. As such, it is believed that the methodology of this study will help assess whether the current concerns about grade inflation are justified.

The study is organized as follows: The “Background” section presents the findings of the related studies, as well as the aims and research questions for the study. Next, the “Method” provides details on the sample, data collection procedure, and data analysis. Moreover, the “Findings” section comprises three subsections: (1) the findings regarding the distribution of high honors (GPA > 3.50) graduates by year; (2) the findings on grade inflation; and (3) an analysis of the factors affecting grade inflation. The final two sections include the “Discussion” and “Conclusions” of the study.

Background. The assessment of students in higher education has a significant impact on the qualifications that they acquire before their graduation. However, this impact is largely ignored in student evaluations. In this sense, student grades are intended as indicators of their academic achievement (Pattison et al., 2013), yet when grades are inflated, questions are raised about what is at their core (Larry Crumbley et al., 2012). Grade inflation in this context refers to the practice of giving higher grades for equivalent achievement. It can be defined as the increase in the frequency of high grades (such as letter grades A and B) in universities and, accordingly, the decrease in the real value of these grades (Tucker and Courts, 2010). Kamber (2008), however, argues that treating the issue of grade inflation as simply an increase in grade points is insufficient for understanding its core mechanism, defining it instead as a “reduction in the capacity of grades to provide accurate and useful information about student performance” (p. 47). Yang and Yip (2003), on the other hand, refer to grade inflation as “giving higher grades to the students than they deserve”. For Larry Crumbley et al. (2012), this practice in university systems constitutes a “deadly symbiosis”.

To expand on the understanding of the issues, grade inflation has been seen as the artificial inflating of grades regardless of academic effort or student characteristics (e.g., skill, motivation) (Kuh and Hu, 1999), a process that lowers the value of a high grade to an average grade (Bar et al., 2012). In doing so, grades

become less informative with respect to the level of knowledge and competence students have and makes it difficult to use grades as a measure of the quality of their achievement in terms of educational goals (Bar et al., 2009, 2012; Tampieri, 2011; Tucker and Courts, 2010). At the same time, it becomes more difficult to make a distinction between students based on their actual achievement (William et al., 2007). As Tucker and Courts (2010) point out, this weakens academic standards, making it difficult to equate grades to student knowledge and qualifications. Contributing to this issue, it has been argued that grading in higher education institutions is unnecessarily standardized and generally subjective (Lee et al., 2007).

There have been few empirical studies on grade inflation in higher education systems, aside from in the USA, where this issue has been widely investigated (Astin, 1998; Rosovsky and Hartley, 2002). For instance, there have been a number of studies documenting the prevalence and severity of grade inflation in American universities over the past few decades. Many have emphasized that students spend less time studying in courses where grade inflation is common, and students who receive inflated grades in introductory or prerequisite courses often fail in advanced courses (Carter and Lara, 2016). For this reason, some universities have taken various measures to prevent grade inflation. For example, Princeton University stipulates that it is not acceptable for more than 35% of grades awarded in any course to be as (Damjanovic, 2013).

Schools where grade inflation is very common have negative effects on others, making grade inflation much more frequent (William et al., 2007; Yang and Yip, 2003) due to pressure to obtain more resources (De Witte et al., 2014; Richmond, 2018). Rojstaczer (2015) provides the following three reasons for grade inflation: (i) obligatory student assessments of their courses, (ii) students' becoming increasingly career-oriented, and (iii) higher school fees. These factors may influence the grading tendencies of some faculty members and lead to an unfair evaluation of students. Students who take courses from lecturers who are prone to awarding higher grades more frequently have a greater chance of graduating their university program with a higher-grade point average than students who take most of their courses from lecturers who award higher grades less frequently (Johnson, 2003). For this reason, students tend to prefer courses with instructors who give higher grades and tend to give more positive responses when evaluating the courses of these instructors. Therefore, faculty members who are concerned with receiving higher evaluation scores cause grade inflation by giving higher grades. In other words, there is a positive relationship between the grades students receive and the assessment scores given by the students (Atalay, 2018; Ewing, 2012; Johnson, 2003). In addition, giving a high grade requires less effort on the part of the instructor, while giving a low grade is more burdensome, because when a low grade is given, it is necessary to reply to student objections, and additional paperwork, phone calls, and e-mails are needed. This can be seen as an additional workload for educators (Tucker and Courts, 2010). In summary, teaching staff tend to give higher grades in consideration of salary increases, promotions, and positive evaluations of their teaching (Johnson, 2003).

Grade inflation has also been linked to a tendency for educators to put less effort into course content (Rosovsky and Hartley, 2002). However, grade inflation has also been emphasized as decreasing the motivation of students to study, resulting in diminished student performance (Kuh and Hu, 1999; Rojstaczer and Healy, 2012; Stroebe, 2020). In addition, this behavior from one faculty member may also affect the teaching behaviors of colleagues. Thus, the willingness of faculty members to set lower standards for their students can quickly become

involved in the process of grade inflation (Chan et al., 2007; Rosovsky and Hartley, 2002; Yang and Yip, 2003), and the benefits that instructors will gain and the negative situations they will avoid will encourage them to continue their grade inflation tendencies.

Another factor influencing instructors' perceptions of student performance, thereby changing their grading structure (Kuh and Hu, 1999), is that of the students' résumés. For universities that tout the employment rates of their graduates, the fact that students' average grades play a role in recruitment and that employers may ignore other aspects of students' abilities and see grades as the only indicator of their skills, are further factors leading to grade inflation (Chan et al., 2007; Kostal et al., 2016; Tampieri, 2011). On the other hand, the existence of disciplined schools that discourage grade inflation may effectively reduce the incidence of grade inflation among other (undisciplined) schools (Yang and Yip, 2003). Moreover, providing better education and standards for faculty are potential options for countering grade inflation (Tucker and Courts, 2010). A further means to mitigate this issue entails a careful definition of the criteria used for issuing letter grades (Carter and Lara, 2016).

In summary, grade inflation refers to the tendency to lower academic requirements and to give students higher grades than they deserve (Berezvai et al., 2020), effectively decreasing the actual value of the highest grade of A at universities (Bar et al., 2012). It weakens standards, making it difficult to equate grades to student knowledge and qualifications (Tucker and Courts, 2010). There is no single consensus on the causes and consequences of rating inflation. However, there are three main problems with respect to grade inflation in contemporary higher education. First, the proportion of graduates with high honors is increasing, so that A and B grades are awarded more frequently in courses than grades C, D, or F. The second is the artificial increase in the grade point averages of university graduates. The third is the contributing factors that affect graduates' GPAs. All of these topics are discussed in this study.

Research questions. This study considers teacher training programs over the past twenty years in terms of (i) changes in the number of students graduating with "higher honors (GPA > 3.50)" and "honors (GPA of 3.00–3.49)", (ii) increases in grade inflation and (iii) factors affecting the GPAs of graduating students. In line with these issues, the study attempts to answer the following research questions:

RQ₁ Has the number of graduates of teacher training programs with "higher honors (GPA > 3.50)" and "honors (GPA of 3.00–3.49)" changed over the years?

RQ₂ Does grade inflation exist in teacher training programs?

RQ₃ Do student gender, admission scores, teaching field, year of program establishment, and student-faculty ratio affect the GPAs of graduates, potentially contributing to grade inflation?

Methodology

Design. We designed our study following the framework of secondary research, which includes the analysis of original secondary data. The secondary research method involves summarizing and collecting already existing data to increase the overall effectiveness of the research. In secondary research, the data reliability is higher than in primary research, as the data are collected by organizations or businesses (Karadag, 2021a). The secondary data source for our study was the graduate databases of universities and/or faculties of education. The data were obtained by anonymizing the databases.

Data set. There are teacher training programs in 32 fields in Türkiye. Of these, two are related to preschool teaching (preschool, English, guidance, and psychological counseling), five are involved in primary school education (physical education and sports, English language, music, art, classroom and guidance and psychological counseling), twelve concern secondary school education (Arabic, German language, physical education and sports, computer science, science, French language, primary school mathematics, English language, music, art, social studies, and Turkish language), sixteen are related to high school education (German language, computer science, biology, geography, philosophy, physics, French language, English language, Japanese language, chemistry, mathematics, music, guidance and psychological counseling, painting-business, history and Turkish language and literature), and one comprise special education. Aside from “Physical Education and Sports Teaching”, which are attached to the Faculties of Sports Sciences, all other programs are part of the 99 faculties of education/educational sciences at 95 universities. In our study, we obtained the data in five stages:

- (1) First, some teacher training programs were excluded from the sample for the reasons given below:
1. Programs of physical education and sports, music, and art, due to the fact these programs admit students through aptitude tests.

2. Programs for secondary education (computer science, biology, geography, philosophy, physics, chemistry, mathematics, history and Turkish language and literature), due to the fact there are few of these programs at public universities, with low enrollment.

3. Programs in the German language, Arabic, French language and Japanese language, due to the fact these programs exist at very few universities.

4. Programs for special education (teaching of hearing, mentally, or visually impaired), because these programs were redesigned in.

Therefore, we limited our study to programs that train teachers for basic education levels (science, primary school mathematics, English, preschool, guidance and psychological counseling, classroom, social studies, and Turkish) found in 70 faculties of education/educational sciences.

- (2) In the second step, the teacher training programs selected were ranked for each year between 1999 (graduation year is 2003) and 2022 based on the GPAs of their graduates.
- (3) In the third step, we classified the teaching programs as “very high”, “high”, “medium”, “low” and “very low” depending on the ranking of the last graduate in the program.
- (4) In the fourth step, we selected a teacher training program covering all grade levels for each year.
- (5) In the fifth and final stage, we used the graduate databases of the universities and/or faculties of education included in the study in Stage 3 as the secondary data source for our study. Relevant data were obtained from the graduate databases by anonymization. Therefore, the data for the study cover the student information from 32 education faculties in Türkiye for the period between 2003 and 2022; the data include graduation grade information for 173,232 individuals, of whom 113,544 (65.5%) were female and 59,688 (34.5%) were male. With Türkiye’s inclusion in the Bologna Process in 2002, the General Grade Point Average at graduation for the students who entered universities in 2002 (graduation year 2006) was calculated out of 4. Prior to 2006, the GPA was calculated out of 100, creating some

Table 1 Note categorization system.		
Value over 100 points	Coefficient of 4	Letter grade
88-100	4.00	AA
81-87	3.50	BA
74-80	3.00	BB
67-73	2.50	CB
60-66	2.00	CC
53-59	1.50	DC
46-52	1.00	DD
35-45	0.50	FD
0-34	0.00	FF

differences in averages. Therefore, we converted the graduation GPAs using a semantic letter system to standardize these differences. Accordingly, the General Weighted Grade Point Average may vary between 2.00 and 4.00 (see Table 1).

Data analysis. As our study requires longitudinal (panel) data, we decided that stochastic frontier analysis was appropriate to answer our first two research questions (RQ1 & RQ2). In this analysis, time series and cross-section series were combined to create a data set with both time and cross-section dimensions. Stochastic frontier analysis consists of traditional fixed and random effect models. These traditional models assume that some variables do not change over time. Since we aimed to examine the effect of various potential variables individually, as well as the interactions among the variables on grade inflation, we used the “real” (university) random effects estimator model (REE) reformulated by Greene (2005) to consider student and university-based differences within the years, based on the previously mentioned shortcomings of traditional models and discussions in the grade inflation literature. In this regard, what matters in REE is not the existence of unit or unit and time-specific coefficients, but the unit or unit and time-specific error components. In addition, REE takes into account not only the effects of differences in the observed sample according to the cross-section, units and time, but also the effects outside the sample (Greene, 2005).

In this process, we added dummy variables of the students’ characteristics (gender ratio -% female-) and university characteristics (achievement ratio of the lowest-scoring student placed in the program, establishment year of the program and status of the university -public vs. private-) during the analysis of the changes in the rate of those graduating with “higher honor (GPA > 3.59)” (RQ₁) and the analysis of grade inflation (RQ₂). For each dummy variable, the c(category)-1 dummy pattern was developed to avoid multicollinearity. The excluded value reference value for dummy variables represents the difference between this reference and the fit values of the remaining groups.

Regarding the third research question (RQ₃), the ANOVA and *t* test were used to analyze the following factors that are believed to affect graduation GPAs: (i) gender, (ii) admission score, (iii) field of teaching, (iv) establishment year of the program, and (v) student ratio per faculty member. For the ANOVA and *t* test, GPA was coded as dependent variable, while for ANOVA, admission score (high, medium, and low), field of teaching (science, primary school mathematics, English language, preschool, guidance and psychological counseling, classroom teaching, social studies and Turkish language), establishment year of the program (younger: 1–5 years, medium: 6–10 years and experienced: 11 and older), and (v) student ratio per faculty member (*lower*: 35 or lower, *intermediate*: between 36 and 50 and

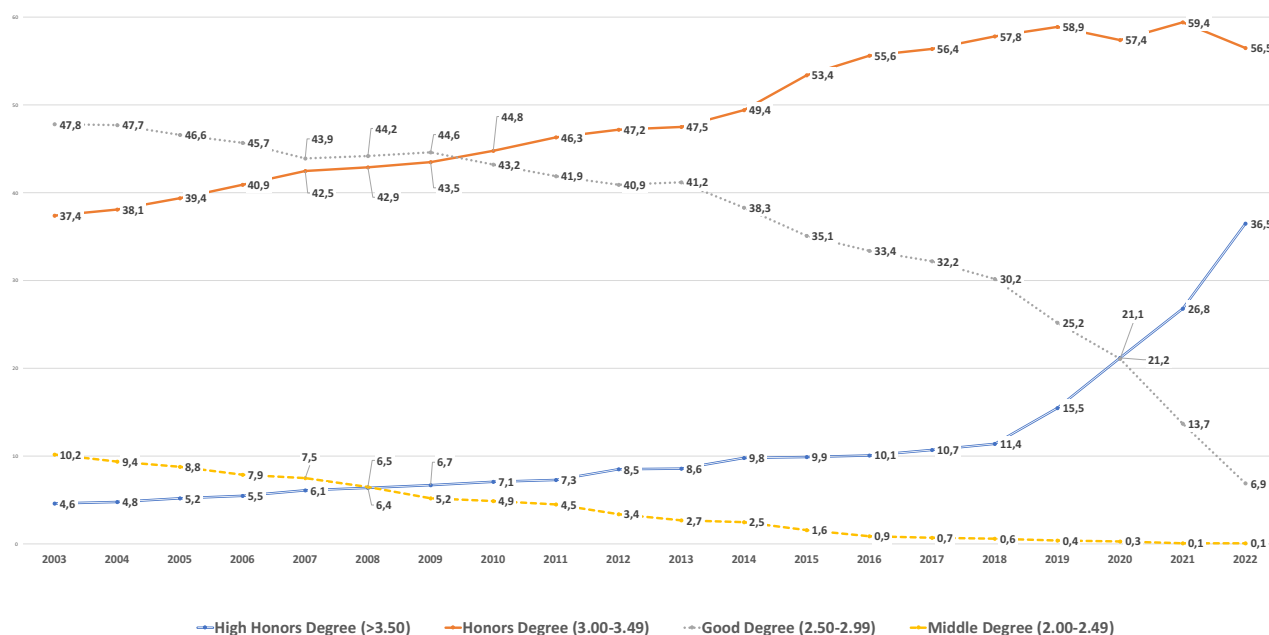


Fig. 1 The graduation grade classification of all students (%).

Table 2 Standard random effects estimates.

Variable name	Random effects
Students' characteristic	
In (% female)	0.37 (0.073)*
University characteristics	
In (percentile of the last student)	−0.41 (0.059)*
Faculty age	−0.13 (0.182)*
Non-profit private universities	0.03 (1.983)
σ _i	0.095
σ _e	0.084
ρ _{oi}	0.796
Within R ²	0.635
Observations	173,232
Number of universities	32

*P < 0.001.

higher: 50 or higher) were coded as independent variables. Analyses were run using SPSS V.25 and Excel programs.

Results

Graduates with “high honors (GPA > 3.50)”. The distribution of “high honors and honors” graduates from teacher training programs in Türkiye by year (RQ1) is presented in Fig. 1. The rate of graduates with higher honor (GPA > 3.50) in 2003 was 4.6%. However, this rate increased to 36.5% in 2022. Moreover, the rate of graduate with “honors (GPA of 3.00–3.49)” was 37.4% in 2003, while it was 56.5% in 2022. The distribution of the other groups of graduates in the past twenty years was as follows: the rate of those at a “good level (GPA of 2.50–2.99)” was 47.8% in 2003, and 6.9% in 2022; while the rate of those with an “intermediate level (GPA of 2.00–2.49)” was 10.2% in 2003, but 0.1% in 2022.

The results of the random effects estimates analysis we conducted to determine the factors affecting the “High Honors

(GPA > 3.50)” level are presented in Table 2. The results of the analysis indicate that female students were more likely to graduate with high honors than their male peers and that the related coefficient was statistically significant. This result suggests that being a female student had a positive and significant effect on performance. It was also seen that a 1% increase in the proportion of female students increased the average of graduates with high honors by 0.37%.

When we examined the change in the rate of graduates receiving a “high honors” degree, we found a significant and negative relationship between the admission score of the lowest-scoring student placed in the program (the lower the percentage, the higher the admission score) and the percentage of graduates with a “high honors” degree. For example, a 10% decrease in admission scores increased the percentage of graduates with “high honors” by 4.1%. This result shows that the programs that admitted students with low scores graduated more students with “high honors” degrees than the programs that received students with high scores.

Furthermore, we found a significant and negative relationship between the establishment year of the teacher training programs and the percentage of graduates with high honors. The coefficients we obtained showed that a 10% increase in the establishment year of the programs decreased the average of the graduates with “high honors” by 1.3%. This also indicates that younger teacher training programs produced more graduates with “high honors” degrees than relatively older teacher training programs.

In Türkiye, there are both public and private universities. Education at public universities is at no cost to the students. However, students enrolled in private universities pay tuition to attend. In our study, the analysis showed that the public or private status of the university did not have any significant effect on the rate of graduates with “high honors” and that the related coefficient was not statistically significant.

In our model, years were added as dummy variables. In order to avoid multicollinearity problems in the model, the number of dummy variables was determined as one less ($N - 1$) than the

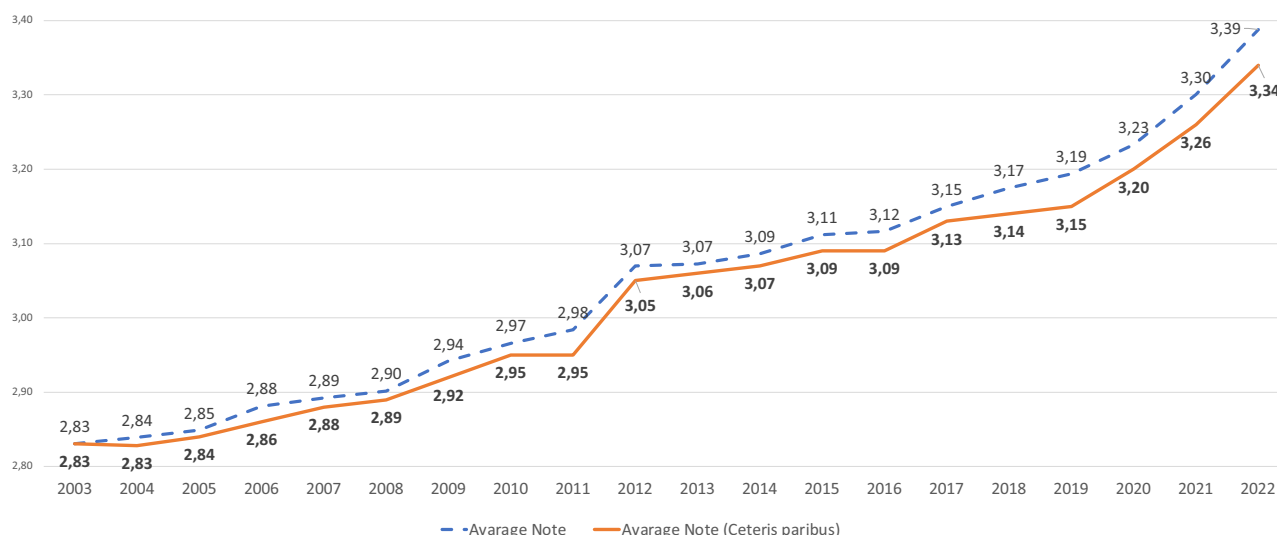


Fig. 2 The graduation grades of all students.

number of units (years). In this causal study, we created 19 dummy variables for the 20-year period examined in the analysis. The coefficients of the dummy variable for years were found to increase. In addition, when controlled for student and university characteristics, the estimated coefficients for the year dummy variables were statistically significant from 2003 ($P < 0.001$). According to the point estimate of the 2022 dummy variable (with all other things being equal), the rate of graduates with “high honors” increased from 4.5% in the 2003 academic year to 35.3%, which indicates a sixfold increase (Fig. 1). This shows that the sevenfold increase in the rate of graduates with “high honors” when the variables were not controlled was almost entirely explained. These results present evidence that there has been grade inflation in the teacher training programs in Türkiye in the last 20 years.

Grade inflation. The distribution of GPAs in teacher training in Türkiye according to changes (RQ2) is presented in Fig. 2. The analysis of factors affecting high honors graduates provided further evidence of grade inflation in Turkish teacher training programs, as shown by the overall increase in GPAs. While students from teacher training programs in Türkiye graduated with an average GPA of 2.83 ($SD = 0.29$) in 2003, this average increased to 3.39 ($SD = 0.26$) with an average of 0.56 points in the past 20 years (2022). The difference we found was quite high and statistically significant ($t = -85.18$, $P < 0.001$). A marginal increase of 19.68% was found in graduation GPAs from 2003 to 2022; this finding is an indicator of high-grade inflation in teacher training programs in Türkiye. When we examined the grade point averages in terms of years, we noted significant increases every year compared to the previous year. The highest annual grade increases (inflation) were found for the students who graduated in 2012, with 2.88%; in 2022, with 2.64%, and in 2021, with 2.08% (Graph 2).

The results of the analysis on the rate of graduates with “High Honors (GPA > 3.50)” showed that graduating with a high honor degree was related to gender, the admission score of the lowest-achieving student placed in the program, and the establishment year of the program. We calculated the averages adjusted for these factors with ANCOVA for years (Graph 2). Then, we found a marginal increase of 17.99% (difference = 0.51) in graduation GPAs over a twenty-year period, and we accordingly found

evidence of very high-grade inflation in teacher training in Türkiye.

Factors affecting grade inflation. The results of the analyses run on the potential contribution (RQ3) of gender, admission score, teaching field, establishment year of the program, and the student-faculty ratio on GPAs of graduating students are presented below.

Gender differences. The previous findings in the literature have generally cited gender as a major factor affecting graduation GPAs. In our study, t tests were used to analyze the variation in graduation GPAs based on the gender of the students. Our findings showed that female students’ graduation GPAs ($M = 3.11$, $SD = 0.29$) were higher than their male peers ($M = 2.91$, $SD = 0.28$) ($t = 139.08$; $p < 0.001$). Therefore, the gender of the students was demonstrated to affect their graduation GPAs.

Admission score differences. Admission scores were also among the factors affecting the graduation GPAs. Students are admitted to higher education institutions in Türkiye via a central examination (Higher Education Institutions Exam), which includes items in Turkish language, mathematics, science (physics, chemistry, and biology) and social sciences (geography, history, and philosophy). The admission scores of each undergraduate program for each year were coded in three groups: high, medium, and low. Then, the relationships between graduation GPAs and university admission scores were examined with ANOVA. The results showed that there was a difference between graduation GPAs based on the university admission scores ($F = 942.2646$; $P < 0.001$). The lowest graduation GPAs were found within the group of “high” admission scores ($M = 2.77$, $SD = 0.28$), while the highest graduation scores were in the group of “low” admission scores ($M = 3.06$, $SD = 0.27$). On the other hand, the average of the graduation GPAs in the programs was 2.95 ($SD = 0.31$) in the middle admission group. Therefore, the admission scores of the students were found to have affected their graduation GPAs.

Subject field differences. Eight different teacher training programs were included in the study. It has been established that teaching

fields differ in terms of both the competencies expected from the students and the difficulties of the courses offered. Therefore, another contributing factor affecting graduation GPAs was believed to be the field of teaching programs. We analyzed the variation in graduation GPAs based on the teaching fields (science, primary school mathematics, English language, preschool, guidance and psychological counseling, classroom teaching, social studies and Turkish language) with ANOVA. Our results showed that there was a difference between graduation GPAs depending on the fields ($F = 1.436.15$; $P < 0.001$). The lowest graduation GPAs were found in the science teaching programs ($M = 2.93$, $SD = 0.36$), and the highest graduation GPAs were found in the guidance and psychological counseling programs ($M = 3.24$, $SD = 0.31$). Thus, it is safe to argue that the field of the program affected the graduation GPAs.

Establishment year of the teacher training programs. In the study, teacher training programs were classified into the following three categories based on the year of first graduation: younger (1–5 years), medium (6–10 years) and experienced (11 and older), and the experience of the teacher training programs was considered as another contributing factor affecting graduation GPAs. We analyzed the variation in graduation GPAs based on the age of the teacher training programs using ANOVA. The results showed that there was a difference between the graduation GPAs of the students depending on the experience of the teacher training programs ($F = 2,020.46$; $P < 0.001$). The lowest graduation GPAs were seen in the most experienced programs ($M = 2.95$, $SD = 0.30$), while the highest graduation GPAs were found in the junior teacher training programs ($M = 3.11$, $SD = 0.26$). In the intermediate teacher training programs, the average of graduation GPAs was found to be 3.04 ($SD = 0.27$). Therefore, it can be stated that the age of the teacher training program affected the graduation GPAs.

Ratio of students per faculty members. Although the number of students per faculty member in teacher education programs in Türkiye varies by year, it is 44 on average. We classified each program in three categories depending on the number of students per faculty member on a yearly basis: *lower* (35 or lower), *intermediate* (between 36 and 50) and *higher* (50 or higher). In this respect, another contributing factor affecting graduation GPAs was believed to be the number of students per faculty member in the program, and we examined this differentiation using the ANOVA. Our results showed that there was a difference between the graduation GPAs based on the number of students per faculty member in the programs ($F = 5062.68$; $P < 0.001$). The lowest graduation GPAs were found in the teacher training programs with low numbers of students per faculty member ($M = 3.09$, $SD = 0.13$), and the highest graduation GPAs were seen in the teacher training programs with a high number of students per faculty member ($M = 3.49$, $SD = 0.10$). Therefore, it is possible to argue that the number of students per faculty member in the program affected the graduation GPAs.

Discussion and conclusion

Our study investigated grade inflation in Turkish teacher training programs by examining the rates of students graduating with high honors, their average GPAs, and the factors potentially affecting their grades over a 20-year span. The results provide significant evidence of grade inflation, with a marginal increase. When other factors that may increase the graduation GPA within the 20-year period covered in our study were controlled, the marginal increase of 7 in the rate of graduates with high honor degrees is consistent with the findings supporting the existence of grade

inflation. For instance, while the rate of A grades among graduates was 24% (35% B, 27% C, 9% D, and 4% F) in 1982, this rate increased to 38% in 2001, and the rate of D grades was 9%, which decreased to 6% (Hernández-Julián and Looney, 2016). In the current study, it was revealed that gender was the leading variable affecting graduation GPAs at a “very good GPA (>2.99) level”. This result is consistent with the previous findings arguing that being female has a positive and significant effect on graduation performance (Smith and Naylor, 2001; McNabb et al., 2002; Barrow et al., 2009). Yeritsyan et al. (2022) likewise argued that the increase in the number of female students is one of the most important reasons for the increase in grades. Studies advocating that female students have significantly higher grades attribute this difference to the “discrimination” and personal relationships to which male students are exposed. In a study conducted to investigate the situation in question, the existence of the “discrimination” effect could not be proven (Hinnerich et al., 2011). However, the participation of women in higher education in Türkiye has been increasing over the years. Some studies (Bachan, 2017) have concluded that the increase in women’s participation in higher education has narrowed the gender gap in performance, but the increase in the rate of women in higher education in Türkiye does not indicate that there is no decrease in quality and ability compared to the past.

Our results reveal a marginal grade increase in teacher education in Türkiye, even after controlling the effects of factors that could account for the differences in grades. The grade inflation of 18% (2.83–3.34), which was determined over a 20-year period, is one of the highest values reported in the related studies. Several studies have presented an increase in average undergraduate grades over the past half century. Average grades at American universities, where the most common analyses of grade inflation have been conducted, have increased from 2.5 to 3.1 (on a 4-point rating scale) in just under 50 years, from 1960 to 2006 (Hernández-Julián and Looney, 2016; Rojstaczer, 2015). In addition, Rojstaczer and Healy (2010, 2012) found that average grades have increased roughly 0.1 (from 0 to 4) per decade from the 1960s, or roughly 0.7 at private universities and 0.5 at public universities from 1960. Similarly, Summary and Weber (2012) found that the grade point average (GPA) at a university in southeast Missouri rose from 2.6 in 1985 to 3.1 in 2004. In another instance, it was reported that grades have increased from 2.83 to 2.97 between 1993 and 2004 (Babcock, 2010).

In this study, the highest rate of grade inflation was found for the years of 2012, 2021, and 2022. The graduates of 2012 had mainly been admitted to university programs in the 2008–2009 academic year. In Türkiye, until 2005, some of the high schools (about 60%) comprised 3-year programs, while others (about 40%) were 4-year courses of study. After 2005, all high schools were extended to four years. As a result of this change, 730,000 students graduated from high schools in 2007, while this number decreased to 320,000 in 2008. However, the same decrease was not seen in both university and teacher training programs in 2008. For example, while there was one university quota for every 4 high school graduates in 2007 (with a total quota of 192,049), in 2008, it was 1.3 for the high school graduates (with a total quota of 257,115). The same is also valid for teaching programs (2007 teaching quota: 169,169 and 2008 teaching quota: 174,301). This situation triggered a very high level of grade inflation in 2012 by causing lower-achieving students to enter teacher training programs. Due to the COVID-19 pandemic, which affected the whole world in 2019, courses and internships in 2020 and 2021 were held without obligation to attend courses in Türkiye. Particularly at the beginning of the epidemic, the interruption of face-to-face education in universities began a period of time that can be seen as “lost period”.

This public health issue, which all students and faculty members experienced for the first time, caused all parties to show less motivation than necessary for the educational process. Thus, the findings regarding the years of 2021 and 2022 were consistent with the findings reported in a comprehensive study (Karadag, 2021b) arguing that the pandemic caused a 9.21% inflation in grades compared to the previous year. Karadag (2021b) attributed the reason for the dramatic increase in grades in this period to the fact that the faculty members, who are accustomed to face-to-face education, made only quick assessments of students through assignments or through the final exam, and therefore, failed to give the necessary attention to student improvement. However, particularly in the first semester of the COVID-19 period, the fact that the lessons were conducted only via “lecture notes” also reduced the level of performance expected from the students by the lecturers, who put minimal effort into their courses.

Many researchers and policymakers see the ratio of students to faculty members as a regulatory mechanism for improving higher education. The most important result we obtained in our study was related to the effect of the number of students per faculty member on grade inflation. As an effect of the quantitative growth in higher education, the increase in the number of students per faculty member significantly increased the inflation in graduation GPAs. For example, the number of students per faculty member, which was below forty in teacher education programs in Türkiye in the 2000s, has increased to over fifty today. This situation has been a trigger for grade inflation. In this respect, a low number of students per faculty member, which is considered as the basic standard for improving the quality of higher education, has been upheld as an important factor. Therefore, these results were not surprising.

There are conflicting results in previous studies regarding the relationship between university admission scores and the percentage of graduates with high honors and their graduation GPAs. For instance, this correlation has been reported as positive in some studies (Bachan, 2017; Carter and Lara, 2016; Johnes and Soo, 2017), but others reported a negative correlation (Karadag, 2021a, 2021b; Moore et al., 2010). There are also other studies arguing that the reputations of universities that graduate their students with high degrees are not better than those that graduate their students with low degrees (Moore et al., 2010). In our study, we found a negative relationship between university admission scores and the percentage of graduates with “high honor” degrees and their graduation GPAs. There are several possible explanations for this situation. In Türkiye, admission to universities is contingent on passing a standardized examination. As a reflection of this situation, prospective students tend to make choices in the context of the university rankings in the past years. One of the most important indicators determining this ranking is the status of the university and its faculty members in society. This situation can create pressure on university administrations and faculty members working at universities of which admission scores are higher, which implicitly leads to lower grade policies. Well-established universities are aware of grade inflation and take certain measures to avoid it. For instance, Princeton University has declared that it is not permissible for more than 35% of enrollees to receive A grades in their courses (Damjanovic, 2013).

Teacher teaching programs are quite comprehensive and have different content. There are conflicting results reported in the previous studies regarding the existence of mathematics-based programs (such as science and mathematics) or programs that depend on verbal skills (such as social sciences, Turkish language), and the change in the graduation GPAs of students. In some studies, it has been reported that students in science-related fields achieve lower grades when compared to graduates of non-science-related fields (Berezvai et al., 2020; Rojstaczer and Healy, 2010), while in some

studies, no difference was found in the graduation GPAs of the students in terms of these fields (Carter and Lara, 2016). In our study, the findings are consistent with the studies in the first group. The highest graduation GPAs were observed in social sciences-oriented teaching areas, while the lowest graduation GPAs were observed in science and mathematics-oriented teaching areas.

In conclusion, it is quite clear whether “grade inflation” is the result of students’ effort or increased industriousness, or whether it is due to higher-quality student recruitment or a “pure” grade inflation, because while the total number of students in teacher training programs was around 138,000 in 1999, this number has increased over the years to 300,000. This is an indication that the admission scores of students identified through a centralized examination have declined over the years. Therefore, when the control variables in the study are considered, it can be seen that the reason for the grade inflation in teacher training programs in Türkiye is not better performance of the students. On the contrary, the real reason for the grade increase is grade inflation. Some educators regard the continuous increase in grade point averages as a radical change in students’ unutilized capacity, rather than a threat (Chen, 2018), while others suggest that grade increases are the result of factors such as increasing student quality over time and teaching and learning techniques (Lin, 2019). Such statements are not supported by the present findings.

In our analysis, due to the limitations in the data set, we had to consider some of the contributing factors that could affect grade inflation. More factors and interactions between these factors need to be analyzed. Examining interaction effects in future studies may reveal how the combined effects of factors may contribute to grade inflation.

Data availability

The data generated and/or analyzed during the current study are not publicly available due to the ethics approval granted on the basis that only researchers involved in the study can access the de-identified data. The minimum retention period is 5 years from publication. Supporting documents are available upon request to the corresponding author.

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Author contributions

SKC: conceptualization, method, formal analysis, data curation, writing (original draft, reviewing, and editing). EK: conceptualization, method, formal analysis, data curation, supervision, writing (reviewing, and editing). The author(s) read and approved the final manuscript.

Competing interests

The authors declare no competing interests.

Ethical approval

The authors confirm that the study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments. Ethical approval was not required as the study did not involve human participants.

Informed consent

Informed consent was not required as the study included secondary data.

Additional information

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