

## Students' Age, Entry Mode and Residence as Predictors of Adjustment and Academic Performance of Mechanical Technology Education Students in Federal Universities in Northern Nigeria

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### ABSTRACT

The study determined students' age, entry mode and residence as predictors of adjustment and academic performance of Mechanical Technology Education (MTE) students (Metalwork/Production and Automobile) in Federal Universities of Northern Nigeria (FUoNN). Three null hypotheses were postulated. The study employed a correlational research design, specifically predictive correlation, with Northern Nigeria as the study area. The target population comprised all 101 students at the 200 level of MTE in FUoNN during the 2022/2023 academic session. A purposive sampling technique was utilized to select 3 Federal Universities offering MTE courses in Northern Nigeria. The sample size consisted of 101 students, representing the entire population. The Student Adaptation to College Questionnaire (SACQ) was employed as the instrument for measuring adjustment. The SACQ, a self-report questionnaire comprising 67 items, utilized a 5-point rating scale. The Cumulative Grade Point Average (CGPA) was used as the measure of academic performance. The SACQ was validated by three experts, and the reliability coefficient was found to be 0.97 using Cronbach's alpha. Regression Analysis was employed to test null hypotheses 1, 2, and 3. The study revealed that psychosocial factors such as age, entry mode, and residence do not significantly predict adjustment and academic performance. It is recommended that universities focus on creating an inclusive and diverse campus culture that welcomes students from various backgrounds.

### ARTICLE INFO

#### Article History

Received: August, 2023

Received in revised form: August, 2023

Accepted: September, 2023

Published online: September, 2023

### KEYWORDS

Age, Entry Mode, Residence, Adjustment and Academic Performance

### INTRODUCTION

It is assumed that being an older or non-traditional student impacts perseverance, in the university, studies have produced mixed results. For example, research has discovered a negative relationship between age and college persistence, implying that getting older is much lower (Gannon et al., 2023). In contrast, a recent study including 21 colleges indicated that older students were more likely to complete their 2-year degrees than younger students (Bahr et al., 2023). The inconsistent findings could be due to several factors. Some researchers have recommended that older students are more likely to juggle multiple responsibilities, including work and family obligations, limiting time allocated for schooling (McCormick et al., 2023).

Older students are more likely to persist because they have more excellent financial resources to fund their college studies (Elman & O'Rand, 2018) and understand the economic benefits of additional schooling (Goldin, 2022). Thus older students begin their studies with a more robust dedication to completing a degree, positively impacting their long-term persistence. However, there may be a nonlinear link between age and persistence, which is supported by a study that divided students into three age groups: under 19, 20–24, and 25 or older (Marques et al., 2022). Results indicated that Those in the 20–24 age group were the most likely to drop out, while students in the 25–64 age group were the most likely to persist, furthermore, their mode of entry is better.

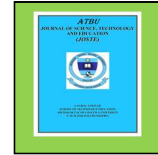
Mode of entry refers to the various ways

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a candidate may be admitted into a first-degree program. The mode of entry to universities is in three forms. These include admission through Direct Entry (DE), admission through Unified Tertiary Matriculation Examination (UTME), formerly known as UME, and through Pre-Degree (PD). The Joint Admission and Matriculation Board (JAMB) is handling admission through UTME and DE, but admission through the PD is being handled by the Universities (Okebukola, 2023) although today, PD students must also sit for UTME and they are part of UTME candidates. The reason for the inconsistency as to which entry mode is better for adjustment and academic performance is still limited, as exists in the issue of students living on or off-campus.

Less research has assessed and reported differences in students living on or off-campus concerning their adjustment and academic performance. A later study by Lacerda, et al. (2023) indicated no significant difference in academic performance between students living on campus in university residences and students living off-campus at home. However, in a more recent study of 401 first-year college students, Nicpon et al. (2017) reported higher academic performance for students who lived on campus than those who lived off campus.

Burton and Ramist, (2017) found that students who lived off-campus had a higher dropout rate than students in university residences. Study by Jones et al. (2018) students living in university residences during the academic year were better adjusted socially to university life than students who lived off-campus. It is thus hypothesized that students who live in a university residence on campus during the academic year will perform better academically and be better adjusted socially than students who reside off-campus or in private accommodation.

Various studies were conducted on the role of adjustment to university as a factor in predicting university outcomes (Hodge et al., 2018). Adjustment is a multi-dimensional procedure of interaction between an individual and his/ her environment to balance an individual's desires, and needs, of the surroundings economically and educationally (Arasli et al., 2020). The importance of

adjustment to university has been studied in a variety of ways, and this differs in terms of students' age, mode of entry and residence. The adjustment is an outcome or predictor variable of academic performance (Il-haam et al., 2019).

Academic performance has a significant relationship with retention and college graduation (Copeland, 2023). Furthermore, it is referred to as the single most revealing indicator that a student is coping with the academic demands of the university and is thus likely to graduate (Taylor, et al (2023). Much evidence indicates that adjustment and academic performance differ among students based on age, mode of entry and residence (Copeland, 2023).

Federal Universities aim to produce highly skilled manpower for the nation (Federal Government of Nigeria [FGN], 2014). MTE students are those students who acquire a degree in teaching technical competency that would allow the graduate to be employed as mechanical engineering technicians in any engineering company and professional teachers of technology in academic institutions (Okoro & Ezeonwumelu 2020). MTE students for this study comprised two options Automobile and Production /Metalwork technology are courses which prospective graduates must pass.

### Statement of Problems

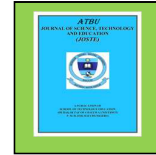
This research aims to investigate the multifaceted relationship between students' age, entry mode, residence, and their impact on the adjustment and academic performance of MTE students enrolled in FUoNN. Understanding how these factors (age, entry mode, and residence), interplay is crucial for educational institutions, policymakers, and educators to develop targeted interventions that enhance students' overall well-being and success in their academic pursuits by exploring the predictors of adjustment and academic performance. The study seeks to identify patterns, challenges, and opportunities that can inform tailored strategies for supporting students in the unique context of FUoNN. This research is imperative in contributing to the enhancement of educational practices and policies, fostering an environment conducive to

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the holistic development of MTE students in the region.

### Objectives of the Study

The study was intended to examine whether;

- i) Students' age predicts MTE Students' adjustment and academic performance in FUoNN.
- ii) Students' entry mode predicts MTE Students' adjustment and academic performance in FUoNN.
- iii) Residence predicts MTE Students' adjustment and academic performance in FUoNN.

### Hypotheses

The following null hypotheses were postulated and tested at a 0.05 level of significance.

- H<sub>01</sub>:** Students' age does not predict MTE Students' adjustment and academic performance in FUoNN.
- H<sub>02</sub>:** Students' entry mode does not predict MTE Students' adjustment and academic performance in FUoNN.
- H<sub>03</sub>:** Students' residence does not predict MTE Students' adjustment and academic performance in FUoNN.

### METHODOLOGY

The study used a correlational research design, specifically predictive correlation. According to Cohen, Manion and Marrison, (2011) in predictive design, the study has the goal of investigating the prediction capability of a given variable. The targeted population and the sample size was purposively selected composed of all 101 students of 200 level of MTE in FUNN as of the 2022/2023 academic

session from 5 universities offered MTE in Northern Nigeria, but only 3 were purposively selected, However 2 universities were excluded from the study, due to distance and security issues and sample size of 101 students was used, thus the study used the entire population, to have a high chance of generalising the findings of the study, reduce sampling error and selection bias to the minimum, and help in obtaining accurate and reliable results (Cohen, Manion & Morrison, 2018).

The instrument for determining adjustment was adapted from Baker & Siryk, 1989 Student Adaptation to College Questionnaire (SACQ). The SACQ is a self-report questionnaire comprising 67 items and has a 5-point rating scale ranging from 5-1, while the measure of academic performance used, the Cumulative Grade Point Average (CGPA), The decision rule provided meant for calculating regression equation was given as follows 4.50- 5.00 = Very High Level (VHL) 3.50 - 4.49 =High Level (HL), 2.50 - 3.49 = Moderate Level (ML), 1.50 - 2.49=Low Level (LL), 0.00 - 1.49= Very Low Level (VLL). SACQ was validated by three experts, and the reliability of the coefficient was found to be 0.97, using Cronbach's alpha. Regression Analysis was used to test null hypotheses 1, 2 and 3, based on the assumption of sample size, multicollinearity and singularity, outliers, normality, linearity, homoscedasticity, and independence of residuals.

### RESULTS

#### Research Hypothesis 1

**H<sub>01</sub>:** Psychosocial factors by age do not significantly predict adjustment and academic performance of MTE students in FUoNN.

**Table 1:** Summary (Age and Students' Adjustment in FUoNN)

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .091 <sup>a</sup> | .008     | .002              | .18378                     |

a. Predictors: (Constant), Age

**Table 2:** Regression (Age and Students' Adjustment in FUoNN)

| Model |            | Sum of Squares | df  | Mean Square | F    | Sig.              |
|-------|------------|----------------|-----|-------------|------|-------------------|
| 1     | Regression | .028           | 1   | .028        | .827 | .365 <sup>b</sup> |
|       | Residual   | 3.344          | 99  | .034        |      |                   |
|       | Total      | 3.372          | 100 |             |      |                   |

a. Dependent Variable: Adjustment

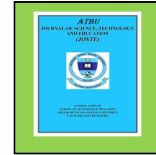
b. Predictors: (Constant), Age

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**Table 3: Regression Coefficient (Age and Students Adjustment in FUoNN)**

| Model        | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|--------------|-----------------------------|------------|---------------------------|--------|------|
|              | B                           | Std. Error | Beta                      |        |      |
| 1 (Constant) | 4.039                       | .057       |                           | 70.344 | .000 |
| Age          | -.041                       | .045       | -.091                     | -.909  | .365 |

a. Dependent Variable: Adjustment

Tables 1 and 2 show significant differences between the various R values,  $F = .827$  (df 1, 100),  $P > .05$ , since the computed p-value (.365) is greater than the 0.05 level of significance. Therefore, the null hypothesis is accepted and concluded that psychosocial factors by age do not significantly predict students' adjustment in Federal Universities in Northern Nigeria. Furthermore, the adjusted R square value (.002) indicates that 2 % of

students' adjustment in Federal Universities of Northern Nigeria in this study was accounted by psychosocial factors by age. Table 3 suggests that psychosocial factors by age do not significantly predict students' adjustment ( $\beta = -.091$ ,  $t = -.909$ ,  $p = .365 > .05$ ). Hence, the null hypothesis of no significant prediction between the predictor and outcome variables is hereby accepted.

**Table 4: Model Summary ( Age and Students Academic Performance in FUoNN)**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .042 <sup>a</sup> | .002     | .008              | .12631                     |

a. Predictors: (Constant), Age

**Table 5: Regression (Age and Students Academic Performance in FUoNN)**

| Model |            | Sum of Squares | df  | Mean Square | F    | Sig.              |
|-------|------------|----------------|-----|-------------|------|-------------------|
| 1     | Regression | .003           | 1   | .003        | .172 | .679 <sup>b</sup> |
|       | Residual   | 1.579          | 99  | .016        |      |                   |
|       | Total      | 1.582          | 100 |             |      |                   |

a. Dependent Variable: Performance b. Predictors: (Constant), Age

**Table 6: Regression Coefficient (Age and Students' Academic Performance in FUoNN)**

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|-------|------|
|       |            | B                           | Std. Error | Beta                      |       |      |
| 1     | (Constant) | 3.983                       | .039       |                           | 100.9 | .000 |
|       | Age        | -.013                       | .031       | -.042                     | -.415 | .679 |

a. Dependent Variable: Performance.

Tables 4 and 5 show significant differences between the various R values,  $F = .172$  (df 1, 100),  $P > .05$  since the computed p-value (.679) is greater than the .05 level of significance. Therefore, the null hypothesis is accepted and concluded that psychosocial factors by age do not significantly predict students' academic performance in Federal Universities in Northern Nigeria. Furthermore, the adjusted R square value (.008) indicates that 8 % of student's academic performance in Federal Universities of Northern Nigeria in this study was accounted for by psychosocial

factors by age. Table 6 suggests that psychosocial factors by age do not significantly predict students' academic performance ( $\beta = -.042$ ,  $t = -.415$ ,  $p = .679 > .05$ ). Hence, the null hypothesis of no significant prediction between the predictor and outcome variables is hereby accepted.

### Research Hypothesis 2

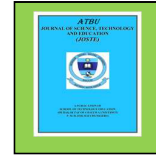
**H<sub>02</sub>:** Psychosocial factors by mode of entry do not significantly predict adjustment and academic performance of MTE students in Federal Universities of Northern Nigeria.

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**Table 7:** Model Summary ( Entry-Mode and Students' Adjustment in FUoNN)

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .069 <sup>a</sup> | .005     | .005              | .18410                     |

a. Predictors: (Constant), Entry mode

**Table 8:** Regression (Entry-Mode and Students' Adjustment in FUoNN)

| Model |            | Sum of Squares | df  | Mean Square | F    | Sig.              |
|-------|------------|----------------|-----|-------------|------|-------------------|
| 1     | Regression | .016           | 1   | .016        | .476 | .492 <sup>b</sup> |
|       | Residual   | 3.355          | 99  | .034        |      |                   |
|       | Total      | 3.372          | 100 |             |      |                   |

a. Dependent Variable: Adjustment, b. Predictors: (Constant), Entry-mode

**Table 9:** Regression Coefficient (Entry- Mode and Student adjustment in FUoNN)

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|-------|------|
|       |            | B                           | Std. Error | Beta                      |       |      |
| 1     | (Constant) | 3.954                       | .055       |                           | 71.94 | .000 |
|       | Entry-mode | .027                        | .039       | .069                      | .690  | .492 |

a. Dependent Variable: Adjustment

Tables 7 and 8 show significant differences between the various R values,  $F= .476$  (df 1, 100),  $P > .05$ , since the computed p-value (.492) is greater than the 0.05 level of significance. Therefore, the null hypothesis is accepted and concluded that psychosocial factors by mode of entry do not significantly predict students' adjustment in Federal Universities in Northern Nigeria, Furthermore, the adjusted R square value (.005) indicates

that 5 % of students' adjustment in Federal Universities of Northern Nigeria in this study was accounted by psychosocial factors by mode of entry. Table 9 suggests that psychosocial factors by mode of entry do not significantly predict students' adjustment ( $\beta = .069$ ,  $t = -.690$ ,  $p = .492 > .05$ ). Hence, the null hypothesis of no significant prediction between the predictor and outcome variables is hereby accepted.

**Table 10:** Model Summary (Entry-Mode and Academic Performance in FUoNN)

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .094 <sup>a</sup> | .009     | .001              | .12586                     |

a. Predictors: (Constant), Entry-mode

**Table 11:** Regression (Entry-Mode and Students' Academic Performance in FUoNN)

| Model |            | Sum of Squares | df  | Mean Square | F    | Sig.              |
|-------|------------|----------------|-----|-------------|------|-------------------|
| 1     | Regression | .014           | 1   | .014        | .881 | .350 <sup>b</sup> |
|       | Residual   | 1.568          | 99  | .016        |      |                   |
|       | Total      | 1.582          | 100 |             |      |                   |

a. Dependent Variable: Performance/ b. Predictors: (Constant), Entry-mode

**Table 12:** Regression Coefficient (EntryMode and Academic Performance in FUoNN)

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|-------|------|
|       |            | B                           | Std. Error | Beta                      |       |      |
| 1     | (Constant) | 3.934                       | .038       |                           | 104.7 | .000 |
|       | Entry-mode | .025                        | .027       | .094                      | .938  | .350 |

a. Dependent Variable: Performance

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Tables 10 and 11 show significant differences between the various R values,  $F = .881$  (df 1, 100),  $P > .05$ , since the computed p-value (.350) is greater than the .05 level of significance. Therefore, the null hypothesis is accepted and concluded that psychosocial factors by mode of entry do not significantly predict students' academic performance in Federal Universities in Northern Nigeria. Furthermore, the adjusted R square value (.001) indicates that 1 % of student's academic performance in Federal Universities of Northern Nigeria in this study was accounted for by

psychosocial factors by mode of entry. Table 12 suggests that psychosocial factors by mode of entry do not significantly predict students' academic performance ( $\beta = .094$ ,  $t = .938$ ,  $p = .350 > .05$ ). Hence, the null hypothesis of no significant prediction between the predictor and outcome variables is hereby accepted.

### Research Hypothesis 3

**H<sub>03</sub>:** Psychosocial factors by residence do not significantly predict adjustment and academic performance of MTE students in Federal Universities of Northern Nigeria.

**Table 13:** Model Summary ( Residence and Students' Adjustment in FUoNN)

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .118 <sup>a</sup> | .014     | .004              | .18325                     |

a. Predictors: (Constant), Residence

**Table 14:** Regression (Residence and Students' Adjustment in FUoNN)

| Model |            | Sum of Squares | df  | Mean Square | F     | Sig.              |
|-------|------------|----------------|-----|-------------|-------|-------------------|
| 1     | Regression | .047           | 1   | .047        | 1.398 | .240 <sup>b</sup> |
|       | Residual   | 3.325          | 99  | .034        |       |                   |
|       | Total      | 3.372          | 100 |             |       |                   |

a. Dependent Variable: Adjustment

b. Predictors: (Constant), Residence

**Table 15:** Regression Coefficient (Residence and Students Adjustment in FUoNN)

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|--------|------|
|       |            | B                           | Std. Error | Beta                      |        |      |
| 1     | (Constant) | 4.052                       | .056       |                           | 72.2   | .000 |
|       | Residence  | -.043                       | .037       | -.118                     | -1.182 | .240 |

a. Dependent Variable: Adjustment

Tables 13 and 14 show significant differences between the various R values,  $F = 1.398$  (df 1, 100),  $P > .05$  since the computed p-value (.240) is greater than the 0.05 level of significance. Therefore, the null hypothesis is accepted and concluded that psychosocial factors by residence do not significantly predict students' adjustment in Federal Universities in Northern Nigeria. Furthermore, the adjusted R square value (.004) indicates that 4 % of

students' adjustment in Federal Universities of Northern Nigeria in this study was accounted by psychosocial factors by residence. Table 15 suggests that psychosocial factors by residence do not significantly predict students' adjustment ( $\beta = -.118$ ,  $t = -1.182$ ,  $p = .240 > .05$ ). Hence, the null hypothesis of no significant prediction between the predictor and outcome variables is hereby accepted.

**Table 16:** Model Summary (Residence and Academic Performance in FUoNN)

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .029 <sup>a</sup> | .001     | .009              | .12637                     |

a. Predictors: (Constant), Residence

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**Table 17:** Regression Table of Prediction between Residence and Students Academic Performance in Federal Universities in Northern Nigeria

| Model |            | Sum of Squares | df  | Mean Square | F    | Sig.              |
|-------|------------|----------------|-----|-------------|------|-------------------|
| 1     | Regression | .001           | 1   | .001        | .081 | .776 <sup>b</sup> |
|       | Residual   | 1.581          | 99  | .016        |      |                   |
|       | Total      | 1.582          | 100 |             |      |                   |

a. Dependent Variable: Performance

b. Predictors: (Constant), Residence

**Table 18:** Regression Coefficient (Residence and Academic Performance in FUoNN)

| Model |            | Unstandardized Coefficients |  | Std. Error | Standardized Coefficients | t     | Sig. |
|-------|------------|-----------------------------|--|------------|---------------------------|-------|------|
|       |            | B                           |  |            | Beta                      |       |      |
| 1     | (Constant) | 3.978                       |  | .039       |                           | 102.8 | .000 |
|       | Residence  | -.007                       |  | .025       | -.029                     | -.285 | .776 |

a. Dependent Variable: Performance

Tables 16 and 17 show significant differences between the various R values,  $F = .081$  ( $df$  1, 100),  $P > .05$  since the computed p-value (.776) is greater than the .05 level of significance. Therefore, the null hypothesis is accepted and concluded that psychosocial factors by residence do not significantly predict students' academic performance in Federal Universities in Northern Nigeria. Furthermore, the adjusted R square value (.009) indicates that 9 % of student's academic performance in Federal Universities of Northern Nigeria in this study was accounted for by psychosocial factors by residence. Table 18 suggests that psychosocial factors by residence do not significantly predict students' academic performance ( $\beta = -.029$ ,  $t = -.285$ ,  $p = .776 > .05$ ). Hence, the null hypothesis of no significant prediction between the predictor and outcome variables is hereby accepted.

### FINDINGS

- 1) The psychosocial factors by age do not significantly predict the academic performance of MTE students in FUoNN.
- 2) The psychosocial factors by mode of entry do not significantly predict academic performance of MTE students in FUoNN.
- 3) The Psychosocial factors by residence do not significantly predict academic performance of MTE students in FUoNN.

### DISCUSSION

This study supports the study of Marques et al., (2022) which indicated that

Those in the 20–24 age group were the most likely to drop out, while students in the 25–64 age group were the most likely to persist. The study of Goldin, (2022) indicated that older students begin their studies with a more robust dedication to completing a degree, positively impacting their long-term persistence and academic performance. The results show that there may be a nonlinear link between age and persistence, which is supported by a study that divided students into three age groups: under 19, 20–24, and 25 or older. Burton and Ramist, (2017) found that students who lived off-campus had a higher dropout rate than students in university residences. Furthermore, in a recent local research study by Jones et al. (2018) students living in university residences during the academic year were better adjusted socially to university life than students who lived off-campus. It is thus hypothesized that students who live in a university residence on campus during the academic year will perform better academically and be better adjusted socially than students who reside off-campus or in private accommodation. The study of Umar (2017) considering the pattern based on the class of degree at which UTME students are moving although the difference was not significant does not qualify them to be given equal consideration during admission with that of UTME.

### CONCLUSION

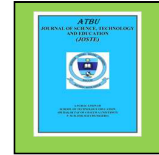
Based on the findings of the study, it can be concluded that students' age, mode of entry,

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and residence are not significant predictors of adjustment and academic performance among MTE students in the FUoNN. The psychosocial factors associated with these demographic variables do not exert a substantial influence on the adjustment and academic performance of MTE students in the specified region. Therefore, other factors beyond age, mode of entry, and residence likely play a more crucial role in determining the adjustment and academic success of MTE students in Federal Universities of Northern Nigeria. Further research may be warranted to explore these alternative factors and their implications for educational outcomes in the context of MTE

### RECOMMENDATION

The following recommendation was made based on the findings of the study

Since psychosocial factors by age, mode of entry, and residence didn't show significant predictive power, it's crucial to focus on creating an inclusive and diverse campus culture that welcomes students from various backgrounds. Emphasizing diversity, equity, and inclusion initiatives can foster a sense of belonging and community, positively impacting students' adjustment and academic performance.

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