The Relationship Between Learning Adaptation and Implicit Truancy Among College Students in A Digital Context: The Mediating Role of Academic Burnout

Xiaxia Jiang[1, 2], Yan Li[3, *], Qi He[3]

[1]School of Psychology, Huazhong Normal University, Wuhan, 430079, China

[2]Research Center of Rural Education and Cultural Development, Key Research Base of Humanities and Social Sciences in Universities of Hubei Province, Xianning 437100, China

[3]College of Education, Hubei Institute of Science and Technology, Xianning, 431700, China

Abstract

With 255 college students as the research subjects, the College Student Learning Adaptation Scale, the College Student Academic Burnout Scale and the Hidden Truancy Scale for College Students were used to examine the influence of college students' learning adaptation on hidden truancy and the mediating role of academic burnout in it. The results found that (1) the implicit truancy behavior of male students was significantly higher than that of female students. (2) There was a significant negative correlation between academic adaptation and academic burnout and hidden truancy among college students (p<0.001); and a significant positive correlation between academic burnout and hidden truancy (p<0.001). (3) The mediating effect of academic burnout between academic adaptation and implicit truancy was significant, and the proportion of the mediating effect of academic burnout to the total effect was 59.35%. Conclusion: Learning adaptation not only directly influences college students' implicit truancy behavior, but also indirectly influences college students' implicit truancy behavior by affecting academic burnout.

Keywords

Digitalization, Learning adaptation, Implicit truancy, Academic burnout.

1. Preface

Hidden truancy is when students do not listen to the teacher and do things that are not related to the class content when they are studying in the classroom or online [1]. With the development of the digital era, implicit truancy among college students in college classrooms is more common compared to truancy in face-to-face learning [2] [3]. Therefore, it is particularly important to explore the causes of implicit truancy. Learning adaptation is the ability of learners to continuously adjust their learning styles and behaviors, overcome the difficulties encountered in learning, and improve their learning adaptation in the process of learning in a multimedia environment. Learning adaptation is a key factor influencing implicit truancy among college students, but the internal mechanism of its influence is not clear [4]. Some studies have shown that learning adaptation is significantly related to academic burnout, and academic burnout is also significantly related to implicit truancy [4]. From the above studies, it can be seen that there is a close relationship between learning adaptation and its academic burnout, and academic burnout plays a non-negligible role in the formation of implicit truancy. According to self-regulation learning theory, learning is a self-regulation process, and students need to constantly adjust their learning strategies and learning goals in order to adapt to different learning environments and tasks. In the process of learning adaptation, students need

to constantly monitor their learning, identify their learning difficulties and errors, and adopt effective adjustment strategies to solve problems. If students do not have effective self-regulation skills, they will experience hidden truancy and academic burnout. In contrast, if students can have high self-regulation skills, they can better adapt to the learning environment and tasks and avoid the phenomena of hidden truancy and academic burnout. A study by Yong Zhang et al [5] demonstrated that the successful use of learning strategies helps students to learn to adapt. Yu [4], who explored the factors influencing implicit truancy, mentioned that academic adaptation was an important influencing factor of implicit truancy among college students, and it had a good negative predictive effect. Academic burnout is a significant positive predictor of implicit truancy and a key influencing factor of implicit truancy. Thus, we conclude that academic burnout can play a mediating role in the relationship between academic adjustment and implicit truancy, and academic adjustment can indirectly contribute to the formation of implicit truancy by mediating academic burnout.

From the above literature, it can be seen that learning adaptation is an important variable influencing implicit truancy, and learning adaptation, academic burnout and implicit truancy are significantly correlated. Does the effect of learning adaptation on implicit truancy work through academic burnout? It is not clear.

Therefore, this study intends to examine the effect of learning adaptation on implicit truancy among college students based on existing studies and the general context of online learning using a survey method, and to examine whether academic burnout plays a mediating role in it. The specific objectives are as follows: (1) to explore the influence of learning adaptation on hidden truancy among college students; and (2) to explore whether academic burnout plays a mediating role between learning adaptation and hidden truancy among college students. This study proposes the following hypotheses to address the above issues: (1) There is a significant negative correlation between academic adaptation and academic burnout and implicit truancy, and a significant positive correlation between academic burnout and implicit truancy among college students. (2) Academic burnout plays a mediating role between academic adaptation and implicit truancy among college students. And the framework of mediation model was constructed.

2. Methods

2.1. Subjects

Table 1. Statistical table of demographic variables

Category		Number of people	Percentage %
Gender	Male	111	44.0
	Female	144	56.0
Grade	Freshman year	73	28.7
	Sophomore year	102	39.8
	Junior	31	12.1
	Senior year	49	19.4
Major Category	Arts	11	4.3
	Science	114	45.4
	Engineering	28	10.8
	Medicine	86	33.2
	Other	16	6.3

322 questionnaires were distributed through undergraduate students in Hubei Province. Among them, 255 valid questionnaires were returned, including 111 (44.0%) male students, 144 (56.0%) female students, 73 (28.7%) first-year students, 102 (39.8%) second-year

students, 31 (12.1%) third-year students, and 49 (19.4%) fourth-year students. This is shown in Table 1 below.

2.2. Tools

2.2.1. Learning Adaptation Scale (LAS)

The Learning Adaptation Scale for College Students (CLAS) was developed by Ting-Yong Feng [6] et al. in 2006 and has been widely used in China to measure the learning adaptation of college students. The scale has 29 entries. The scale is rated on a Liket-5 scale, with scores ranging from 1 to 5 indicating "not at all" to "completely". The internal consistency alpha coefficients of each dimension were 0.797, 0.714, 0.748, 0.740, and 0.726, respectively, with good reliability and high acceptability level. In this study, the internal consistency reliability Cronbach's alpha coefficient for the total score of the learning adaptation scale was 0.876, and the internal consistency reliability coefficients for the five dimensions (learning motivation, teaching mode, learning ability, learning attitude, and environmental factors) were 0.830, 0.673, 0.834, 0.623, and 0.669, respectively.

2.2.2. Hidden truancy scale

The Hidden Truancy Scale (RTS) for college students was developed by Ming-Hong Su [7] et al. It has 28 entries divided into 5 dimensions (academic perception, study habits, self-adjustment, classroom perception, and learning environment). The Liket-5 scale was used, with scores from 1 to 5 indicating "not at all" to "completely", and after converting the reverse scores, the higher the score, the more serious the degree of implicit truancy. The internal consistency alpha coefficient of the total scale was 0.84, and the alpha coefficients of all factors were above 0.7, so the reliability of the scale was high. In this study, the internal consistency reliability Cronbach's alpha coefficient of all items of implicit truancy was 0.782, and the internal consistency reliability coefficients of the five dimensions (academic cognition, study habits, self-adjustment, classroom cognition, and learning environment) were 0.709, 0.794, 0.586, 0.763, and 0.724, respectively.

2.2.3. Academic Burnout Scale

The College Student Learning Burnout Scale (CLBS), developed by Lian Yung [8] et al, is divided into three dimensions (low mood, inappropriate behavior, and low achievement) with 20 questions on a Liket-5 point scale, with scores from 1 to 5 indicating "not at all" to "completely ". The overall alpha coefficient of the scale was 0.865, and the alpha coefficient of each dimension was above 0.7. The correlation between each question item and the total scale ranged from 0.41 to 0.76 ($p < 0.01$), which had good reliability and validity. In this study, the Cronbach's alpha coefficient for all items of implicit truancy was 0.872, and the internal consistency reliability coefficients for each dimension of low mood, misbehavior, and low achievement were 0.770, 0.760, and 0.733, respectively.

2.3. Statistical methods

The results of the survey were statistically analyzed by spss22.0 and process plug-in, and after removing invalid data and retaining valid data, independent sample t-test and one-way ANOVA were used to analyze the demographic variables, explore the differences in the scores of gender, grade, major and other dimensions, and Pearson correlation analysis was used to explore the relationship between the three, and regression analysis was used to explore the effect of learning adaptation and academic The relationship between the three dimensions was investigated by Pearson's correlation analysis, the predictive effect of academic adaptation and burnout on implicit truancy was investigated by regression analysis, and finally mediating effects were tested.

3. Results

3.1. Difference test of demographic variables

The first test was an independent sample t-test for gender, followed by a one-way ANOVA for grade and major category. The effect of gender on academic adaptation, academic burnout and hidden truancy was examined by t-test. Gender was found to have a significant effect on implicit truancy among college students, $t=2.344$, $p<0.05$, and implicit truancy was significantly higher among male students than female students, while the effect of gender on academic adaptation and academic burnout was not significant. A one-way ANOVA was conducted to examine the effects of grade and major on learning adaptation, academic burnout and implicit truancy, and it was found that the effects of grade and major on learning adaptation, academic burnout and implicit truancy were not significant.

3.2. Correlations among academic adaptation, hidden truancy and academic burnout

Pearson correlation analysis was done for each variable, and the results are shown in Table 2 below. According to the results of the correlation analysis, it was found that there was a significant correlation between study adaptation, hidden truancy and academic burnout. From Table 3.1, the correlation coefficient $r=-0.615$, $p<0.001$ between academic adaptation and implicit truancy indicates that there is a significant negative correlation between academic adaptation and implicit truancy; the correlation coefficient $r=-0.682$, $p<0.001$ between academic adaptation and academic burnout indicates that there is a significant negative correlation between academic adaptation and academic burnout; the correlation coefficient $r=0.706$ between academic burnout and implicit truancy indicates that there is a significant negative correlation between academic burnout and implicit truancy. The correlation coefficient $r=0.706$, $p<0.001$, indicating that there is a significant positive correlation between academic burnout and hidden truancy.

Table 2. Correlation analysis table

	Study adaptation	Hidden truancy	Academic burnout
Academic adaptation	1		
Hidden truancy	-0.615***	1	
Academic burnout	-0.682***	0.706***	1

Note: *** indicates $p < 0.001$

3.3. Regression analysis of learning adaptation, implicit truancy and academic burnout

Regression analysis was used to examine the predictive effects of learning adaptation and academic burnout on implicit truancy, respectively, and the results of the study are shown in Table 3.2 below. The regression analysis with learning adaptation as the predictor variable and hidden truancy as the dependent variable yielded R^2 of 0.378, regression coefficient $B=-0.508$, $t=-12.412$, $p<0.001$, indicating that learning adaptation had a significant negative predictive effect on hidden truancy, and its explanation of hidden truancy was 37.8%; with academic burnout as the predictor variable and hidden truancy as the dependent variable, we obtained R^2 was 0.498, $B=0.513$, $t=0.706$, $p<0.001$, indicating that academic burnout had a significant positive predictive effect on implicit truancy, and its explanatory amount for implicit truancy was 49.8%.

Table 3. Regression analysis of academic adjustment, academic burnout and hidden truancy

Predictor variable	Dependent variable	R2	B	β	t
Academic adaptation	Implicit truancy	0.378	-0.508	-0.615	-12.412***
Academic burnout	Implicit truancy	0.498	0.513	0.706	15.847***

Note: *** indicates p < 0.001

3.4. Mediating effects of academic burnout

The mediating effects of academic burnout were examined through process plug-in analysis, and the results of the study are shown in Table 3.3 below. With learning adaptation as the independent variable X, academic burnout as the mediating variable M, and implicit truancy as the dependent variable Y, the mediating model was constructed, including ①X→Y; ②X→M; ③X→M→Y. As can be seen from the results of Table 3.3, testing model ①, the resultant total effect coefficient c = -0.508, t = -12.412, p < 0.001, indicating that the model has a significant c effect; testing model ②, we get a = -0.775, t = -14.845, p < 0.001, indicating that the model's a effect is significant; testing model ③, we get c' = -0.206 (t = 0.049, p < 0.001) and b = 0.389 (t = 0.043, p < 0.001), indicating that the model's c' and b effects were significant. From the above, it can be concluded that academic burnout partially mediates the effect between academic adaptation and implicit truancy, with the mediating effect accounting for 59.35% of the total effect.

Table 4. Mediating effects of academic burnout

Mediating model assumptions	Regression equation	Predictor variable	Effect coefficient	SE	t	ab	ab/c
X→Y	Y=-0.508X	X	-0.508	0.041	-12.412***		
X→M	M=-0.775X	X	-0.775	0.052	-14.845***	-0.301	59.35%
X→M→Y	Y=-0.206X＋	X、M	-0.206	0.049	-4.239***		
	0.389M		0.389	0.043	9.075***		

Note: X denotes academic adaptation,M denotes academic burnout,Y denotes implicit truancy,*** denotes p<0.001

4. Discussion

4.1. Differences among variables on demographic variables

The present study showed that there was no gender difference in learning adaptation, and the results were consistent with the study of Wangguo Fang [9] in 2020, whose results showed that there was no significant difference in the level of adaptation between male and female students, whether they studied online during the epidemic or offline after returning to school. And the results are not consistent with the results of the studies by Ting-Yong Feng [6] in 2002 and Ming-Gui Ge [10] in 2005. This may be due to the fact that with the outbreak of the new crown epidemic, multimedia learning has become increasingly common, and male and female students have comparable levels of familiarity and acceptance of multimedia, so there is no difference in learning adaptation between male and female students. There was no significant difference in learning adaptation in both major and grade categories, indicating that students in different majors and grades are becoming more familiar with the multimedia learning environment with each passing day, so there was no significant difference in learning adaptation among students in different majors and grades.

There was no statistically significant difference in academic burnout by gender. The results of this study are consistent with the study of Wang Xiaoxin [11], which found no significant difference in the level of academic burnout between male and female students, indicating that the gender difference in academic burnout among college students is not significant as they grow older. Academic burnout also did not differ significantly in terms of majors, which is inconsistent with the findings of Lianrong [12] in 2006, whose results found that the overall level of academic burnout was higher among arts and science students than among medical and engineering students. Also academic burnout did not differ significantly by grade level, which is consistent with the results of the study by Tang Li [13] in 2019, but the results of a large number of studies showed that academic burnout differed significantly by grade level, for example, the studies by Qi Zhu [14], Nan Hu [15], Zichen Yin [16], and Xiaoli Sun [17], all found grade level differences in academic burnout levels. The reason for these results may be due to the rapid development of multimedia and the prevalence of equal levels of training in online courses long before college, so there are no significant differences in academic burnout by gender, grade level, or major.

Significant differences in implicit truancy existed by gender, with male students exhibiting significantly higher levels of implicit truancy than female students and female students exhibiting less maladaptive behavior relative to male students. This is consistent with the reality that studies have shown that girls' academic performance is significantly better than that of boys because girls value academic performance more than boys, have higher enthusiasm and better psychological qualities for learning [18], and therefore girls are subject to more self-restraint in the learning process, which leads to less implicit truancy. There were no significant differences in hidden truancy in terms of majors and grades, indicating that students at all university levels and majors have a comparable sense of experience with multimedia information-based teaching, and thus differences in the phenomenon of hidden truancy are less likely to occur in different grades and majors.

4.2.   Discussion of the results of correlation and regression analyses

The results of this study showed that learning adaptation was significantly negatively correlated with academic burnout and hidden truancy, and there was a significant positive correlation between academic burnout and hidden truancy, which verified the research hypothesis. The regression analysis revealed that the predictive power of academic burnout on implicit truancy (37.8% contribution) was greater than that of academic adaptation on implicit truancy (49.8% contribution), which is consistent with the findings of Yu [4], indicating that both academic adaptation and academic burnout are important influencing factors of implicit truancy.

Both study adaptation and academic burnout are important factors influencing implicit truancy among college students. For college students learning adaptation is a part of college life and can directly affect college students' learning and life, "the overall development level of college students' learning adaptation shows a gradual increase with grade, with the lowest level of learning adaptation among freshmen and the highest among seniors" [19], and the problem of learning adaptation gradually shifts from academic pressure The problem of learning adaptation gradually shifts from academic pressure to employment pressure. New students need a period of time to adapt to the changes in university teaching mode, coursework and knowledge system, and when "employment pressure is huge, it is easy to have the idea that university knowledge is useless for work" [20], so poor learning adaptation can easily lead to hidden truancy behavior.

The level of academic burnout among college students in China is increasing year by year [21], and individuals with high academic burnout are prone to lose interest in learning, low sense of achievement, etc. The generation of negative emotions and behaviors will cause students to

stay away from learning, thus easily generating boredom, dropping out of school and poor learning behaviors [22] [23] [24], leading to the generation of hidden truancy. Thus it indicates that when college students experience academic burnout in the learning process, their undesirable behaviors are prone to develop into hidden truancy behaviors.

4.3. The mediating effect of academic burnout

This study found that academic burnout has a significant mediating effect between academic adaptation and academic burnout, which is consistent with the research hypothesis. It indicates that college students' learning adaptation can not only directly affect college students' implicit truancy, but also indirectly affect implicit truancy by affecting academic burnout. The results of this study are consistent with Roger's[25]findings that students with high academic adaptation have higher enthusiasm for learning-related activities and better persistence, so they are more likely to develop good interest in learning, and then the less likely to develop academic burnout, while individuals with lower levels of academic burnout can experience more pleasure in learning, and thus are willing to learn and reduce implicit truancy behavior.

4.4. Shortcomings and Prospects

There are some limitations of the study: (1) In terms of the study population. This study only targets college students in one university in Hubei, and the limited scope of subjects may make the research results biased, so the sample scope should be used in future research to make the research results more accurate. (2) Aspect of research method. This study adopts the questionnaire method, in the process of questionnaire survey, it is impossible to directly observe the subjects, so there may be a random selection or guessing situation, which may affect the results, in the future research can be experimental research to examine the influence factors of hidden truancy of college students. (3) Aspects of mediating factors. The results of this study found that the independent variable (academic adaptation) can indirectly influence the dependent variable (implicit truancy) through the mediating variable (academic burnout), and the dependent variable is significantly different in terms of gender, so "Does gender moderate this mediating path?" can be explored in depth in the subsequent study.

4.5. Summary and Recommendations

Based on the existing studies, this study investigated the influence of learning adaptation on implicit truancy in the context of online learning using a survey method, constructed a relationship model with the mediating variable of academic burnout, and clarified the influence of learning adaptation on implicit truancy and the underlying mechanism.

In addition, combining the results of this study, the following suggestions are made to college educators: firstly, learning adaptation has an important influence on college students' academic achievement and the formation of good behavioral habits, so colleges and teachers should fully understand college students' learning adaptation, explore ways to promote students' learning adaptation from various aspects such as environment, teaching mode and teacher-student relationship, improve external factors, and then improve students' motivation to study. Secondly, the emotion of not wanting to study and boredom brought by high academic burnout is an important factor affecting college students' hidden truancy. Therefore, to help college students improve this negative learning idea, college teachers should help students make internal attribution, mobilize students' motivation, cultivate students' learning goals and actively participate in various learning activities, so as to improve college students' learning adaptation ability, reduce academic burnout and hidden truancy. The purpose is to improve students' learning adaptability, reduce academic burnout and hidden truancy. Finally, the mediating role of academic burnout in improving the hidden truancy behavior of college students reminds us that we should consider the path of improving learning adaptation and reducing students' academic burnout when developing methods, which not only help to

enhance students' learning well-being and improve teacher-student relationship, but also play an important role in students' learning and development.

5. Conclusion

The following conclusions were drawn from this study: (1) Study adaptation is significantly and negatively related to academic burnout and implicit truancy, and there is a significant positive relationship between academic burnout and implicit truancy. (2) Study adaptation not only directly affects the implicit truancy behavior of college students, but also indirectly affects the implicit truancy behavior of college students through affecting academic burnout.

References

[1] Li Jie, Wang Xiongxiong. A study on the phenomenon of truancy among college students [J]. China Youth Studies, 2006(01):77-80.

[2] Chen Li. An analysis of the causes of College Students' recessive truancy and Countermeasures[J]. Scientific Journal of Intelligent Systems Research,2020.2(05).

[3] Meiya Luo. The Post-Epidemic Era: an Analysis of Students' Recessive Truancy in Online Classroom Universities Using Bourdieu's Field Theory[J]. Journal of Sociology and Ethnology,2021.3:24-29.

[4] Yu Xiaolin. Psychological factors affecting implicit truancy among college students: an empirical study based on dominance analysis[J]. Chinese Journal of Health Psychology,2021,29(09):1386-1391.

[5] Zhang Y,He Gao D. An empirical study of learning adaptability and learning strategies[J]. Modern Educational Technology,2012,(04):73-78.

[6] Feng T Y, Su T, Hu X W, Li H. The development of learning adaptation scale for college students[J]. Journal of Psychology, 2006,(05):762-769.

[7] Su M.H., Ni S.D., Xu J., Li H.M. Exploring the development and structure of the implicit truancy scale for college students [J]. Chinese Journal of Health Psychology, 2015, 23(12):1858-1862.

[8] Lian Rong, Yang Lixian, Wu Lanhua. The relationship between professional commitment, academic burnout and scale development among college students [J]. Journal of Psychology, 2005,(05):632-636.

[9] Wangguo F. A comparative study of university students' online and offline learning adaptation[J]. Journal of Zaozhuang College,2021,38(06):99-105.

[10] Ge MG, Yu YB. College students' learning adaptability and its influencing factors[J]. Journal of Anhui Normal University (Humanities and Social Sciences Edition), 2005(05):602-606.

[11] Wang S-X, Miao J-L. Study on the relationship between academic self-efficacy, self-esteem and learning burnout among college students[J]. Journal of Northeast Normal University (Philosophy and Social Science Edition), 2012,(01):192-196.

[12] Lian Rong,Yang Lixian,Wu Lanhua. The status of professional commitment, learning burnout and their relationship among college students[J]. Psychological Science,2006(01):47-51.

[13] Tang L. A study on the grade differences of burnout among college students[J]. Health Professions Education,2019,37(21):131-133.

[14] Zhu Q,Kong P. The relationship between internet addiction and academic burnout and interpersonal interaction among college students in civil aviation colleges and universities[J]. University,2022,(04):96-99.

[15] Hu Nan. Study on the relationship between self-control and academic burnout among college students and intervention [D]. Shanghai Normal University,2017.

[16] Yin Zichen. Study on the relationship between learning burnout and psychological capital and coping styles among college students[D]. Sichuan Agricultural University,2012.

[17] Sun Xiaoli. Study on the Current Situation and Causes of College Students' Learning Burnout[D]. Nanjing Normal University, 2007.

[18] Lan Jun. A comparative study on the difference of academic performance between male and female students among college students[J]. Journal of Hunan Institute of Science and Technology,2016, 37(01):145-147.

[19] Wang Huarong. A study on college students' learning adaptability and its influencing factors[D]. Nanjing Normal University,2006.

[20] Du Xiaoli. Research on hidden truancy of students in higher education [D]. Hunan University,2017.

[21] Yu Xinyue, Yin Mengyan, Zhao Yafei, Xin Sufei. A cross-sectional historical study on the change of learning burnout among Chinese college students[J]. Psychological Technology and Applications, 2020, 8(02):74-83.

[22] Xu Yue, Chen Qishan, Yang Shuting, Yuan Lu. The effects of core self-evaluation and life satisfaction on academic burnout among secondary school students in Macau [J]. Psychological Science, 2017, 40(01):83-88.

[23] Ma LJ,Lai JB. The influence of college students' core self-evaluation and academic burnout on the phenomenon of boredom [J]. Psychological Development and Education,2009,3:101-106.

[24] Li Sumin; Yang Shumin; Zhao Pengyan. The effects of academic burnout and core self-evaluation on implicit dropout performance rate among college students[J]. Modern preventive medicine, 2011, (20):4199-4201.

[25] Luo J, Zhou Yuan, Pan Yun, Zhao Shouying. The moderating role of gender in the relationship between learning adjustment and burnout among college students[J]. Chinese Special Education, 2013,(06):69-73.