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**RESEARCH ARTICLE** **OPEN ACCESS**

# School Attachment and its Dimensions as Predictors of Internet Addiction among High School Students in Kosovo

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**Abstract:**

***Background:*** Nowadays, the importance and influence of the Internet have increased in lives of adolescents, and this has also affected, to some extent, the attachments that adolescents have with the school. This study aimed to examine if the dimensions of school attachment are predictors of Internet addiction among high school students in Kosovo.

***Methods:*** The data were gained from a research population of adolescents aged 15–19 years attending secondary schools in Kosovo. The whole sample consists of 525 students; 310 (59%) of them were female, and 215 (41%) were male, respectively 214 (40.8%) were students attending the tenth grade, 189 (36%) were in the eleventh grade and 122 (23.2%) were in the twelfth grade. Data were collected via a survey with paper-pencil questionnaires from 6 different secondary schools in 4 different cities in Kosovo. In the data analyses, percentage, arithmetic mean, t-test for independent groups, one-way variance, correlation, and regression analysis were performed.

***Results:*** The results of the study show that some of the dimensions of school attachment are predictors of Internet addiction, such as feelings about school (ß=-.306, p<.001), attitudes toward students (ß=.150, p<.01), and student's perception of school (ß=-.143, p<.001). However, two dimensions have not shown a significant impact on internet addiction: interest in learning (ß=0.018, p>0.05) and attitudes toward teachers (ß=-0.02, p>0.05).

***Conclusion:*** Based on the study findings, it can be concluded that the stronger attachment to school is, the lower level of internet addiction is, and vice versa.

**Keywords:** School attachment, Internet addiction, Students, Kosovo, Adolescents, Regression analysis.



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## 1. INTRODUCTION

The fact that technology has become a part of our lives recently brings with it many questions, one of which is how it will affect the future lives of adolescents. School or academic life is one of the most important life periods for adolescents because the choices made during this period can be decisive for the adolescent's later life. So, it is important to spend this period healthily and productively. One of the factors that are effective in making this period more productive is the adolescent's commitment to school [1]. According to January 2023 data from the Weltmater 2022 report, the world's population is 8.01 billion, 64.4% of the world's population is Internet users, and 59.4% are social media users [2]. According to Internet World stats [3], the number of people using the Internet worldwide is 3,366,260,056, and 604,147,280 in Europe. Today, the number of internet users worldwide is thought to be 5.16

billion, and 94.3 percent of users between 16 and 64 connect to the internet with mobile phones. The time spent on the internet daily reached 6 hours 58 minutes in 2022, and in 2023, this time decreased and was calculated as 7 hours 24 minutes; years more time in the real world may have reduced internet use. Most internet users (90.6%) find information and connect with friends and family using Instagram [4].

When the literature is examined, different factors affecting adolescent school attachment and school commitment, which have a wide variety of effects on students with internet addiction, are observed [5], examining the relationship between internet addiction and school attachment dimension levels of high school students and stated that access to the internet and school attachment was a negative relationship. Similarly, in another study, a negative relationship was found between data on the Internet and overall academic achievement in high schools [6]. It was also noted that there was a negative correlation between internet power and school achievement in other popular ones in high school and that their opinions were of family, friends, and school. In a study conducted, it was revealed that there is a negative relationship between internet power and academic achievement and that these people's opinions are affected by gender, age, department, and internet usage time [7]. It can be seen that the realized parts have many different positive effects of a high level of school commitment to individual natures. Positive permanent differences were found between school suitability and location, psychological resilience, self-efficacy belief, commitment to friends and empathetic classroom atmosphere, quality of school life, and perception of school climate [7]. Also, there is a decrease in many negative behaviors in the intensity of force in the region's schools. For example, a disease by Lobel et al. [8], found that there was found a negative relationship between school adherence and the disruption of the Internet. Similarly, Sağlam [9] found that growth in secondary school institutions showed an increase in violence as the number of school districts decreased. In some cases, girls have higher school-based systems than boys. Therefore, those committed to the school can positively improve their academic achievement and psychological health [6].

Economic variables also play a significant role in shaping adolescents' school attachment and internet usage patterns. Studies suggest that students from higher-income families generally have better access to educational resources and support, contributing to stronger school attachment [10]. Conversely, students from lower-income families may face economic stressors that negatively impact their school attachment and increase the likelihood of internet addiction as a form of escaping [9].

The use of the internet for various purposes, such as connecting to social networks, listening to music, doing homework, shopping, and entertainment, has become pervasive among young people, leading to a technology-immersed lifestyle. However, excessive time spent on the internet for purposes other than its intended use can lead to internet addiction, which is known to cause various negative effects such as depression, social isolation, stress, domestic violence, communication disorders, bullying, loneliness, and a decrease in academic performance. In particular, adolescents who feel lonely and unhappy may drop out of school [5].

For this reason, a study was conducted to investigate the relationship between internet addiction and school attachment dımensıons and to examine if the dimensions of school attachment predict internet addiction among high school students in Kosovo. We think that the research findings may be guiding in preventing internet addiction in high school students and increasing school engagement, and may lead to increasing such research for a developing country like Kosovo. The study emphasizes the importance of young people establishing a healthy digital balance and protecting them from the negative effects of internet use. For this reason, it is important to monitor young people's internet usage habits and addiction levels and to be guided by parents and educators.

The hypotheses on which this study is based are:

H1: There are statistically significant differences in Internet addiction and dimensions of school attachment based on socio-demographic variables such as gender, age, academic success, and family income among high school students in Kosovo.

H2: There is a significant negative correlation between overall school attachment and Internet addiction among high school students in Kosovo.

H3: Specific dimensions of school attachment are significant negative predictors of Internet addiction among high school students in Kosovo.

## 2. METHODOLOGY

This research used a scanning model and quantitative methods to examine the relationships between variables. With the relationship screening model, differences between variables, such as gender, age, academic achievement, and family income level about internet addiction were examined. In addition, scanning model and data collection methods were used in the study to investigate the relationships between variables.

Correlational research is a method that measures the strength and direction of the relationship between two or more variables without manipulating an independent variable [11]. With the relational screening model, the differences between high school students' internet addiction and school attachment dimensions and the variables of gender, grade in high school, family income level, academic success, and daily internet use were examined. Correlation analysis and regression analysis were conducted to determine the predictive power of the relationship between high school students' internet addiction and attachment dimension levels.

**Table 1. Distribution of students by section: gender, age, academic success and family income level.**

| Gender | Freq | % |
|---|---|---|
| Female | 310 | 59.0 |
| Male | 215 | 41,0 |
| Age | | |
| 15 years | 101 | 19.3 |
| 16 years | 181 | 34.5 |
| 17 years | 162 | 30.9 |
| 18 years | 73 | 13.9 |
| Other | 7 | 1.3 |
| Academic success | | |
| Enough | 36 | 6,9 |
| Good | 155 | 29,5 |
| Very good | 177 | 33,7 |
| Excellent | 157 | 29,9 |
| Family income level | | |
| Less than 3000 | 113 | 21,5 |
| 3000 until 5.999 | 130 | 24,8 |
| 6000 until 9.999 | 127 | 24,2 |
| 10.000 until 20.000 | 90 | 17,1 |
| More than 20.000 | 65 | 12,4 |
| Total | 525 | - |

## 2.1. Participants

The data present the understanding of school attachment and internet addiction among secondary school students in Kosovo. These data were collected throughout the school year 2022-2023, after the period of the COVID-19 pandemic. The sample consists of 525 adolescents studying in different secondary schools in Kosovo. This sample is not representative of all of Kosovo, but it is representative of the secondary schools of 4 cities at a 95% confidence level and a margin of error of about 4%. Of the participants, 310 (59%) are female, and 215 (41%) are male. 214 (40.8%) of them are students attending the tenth grade, 189 (36%) in the eleventh grade, and 122 (23.2%) attend the twelfth grade. This data can be accessed on the Mendeley repository [12]. Table **1** shows the socio-demographic characteristics of the students who participated in the research.

## 2.2. Instruments

### *2.2.1. School Attachment Scale*

The “school attachment scale” was developed in Albanian by Aslan & Kosir [13], which measures school attachment. The reliability of the entire scale is α = 0.737 from the combined five-item sets reflecting the five dimensions of the school attachment. The scale consists of 24 questions, divided into 5 sub-dimensions: 1) Students' feelings about being in school (5 questions), 2) Students' interest in learning (6 questions), 3) Students' attitudes towards other students (5 questions), 4) Students' attitudes towards their teachers (6 questions), and 5) Students' perceptions of the school (2 questions). In the scale of school attachment, answers were given using a Likert-type scale starting with 1 (strongly disagree), 2 (strongly disagree), 3 (strongly agree), 4 (strongly agree) and 5 (strongly agree).

### *2.2.2. Internet Addiction Scale*

The scale was developed by Tas [14] and adapted into the Albanian language by Basha et al. [15]. Furthermore, the internal consistency coefficient of Cronbach Alpha was found to be 0.828. The factor variances of the 9 scale items were calculated to be between 0.300 and 0.500, and the item factor loadings ranged from 0.549 to 0.70 [16]. The scale was developed in a 5-point Likert type, and the answers were never, rarely, sometimes, often, and always. The scale has a single factor and consists of nine items, indicating that the high scores obtained from the scale are at the level of Internet addiction.

## 2.3. Implementation Process

The special focus of the research was on the relationship between school attachment dimensions and internet addiction. To achieve the aims and ideal results of the study, students who participated were from different cities and schools around Kosovo, using purposive and stratifying sampling. Initially, four Kosovo cities, such as Peja, Lipjani, Klina, and Shtime, were selected purposefully, and based on the terms of the population, one of the selected cities was a large city (Peja), two were medium cities (Lipjan and Klina), and one was a small city (Shtime). The total number of students in these cities was around 8,000, distributed in 11 public schools (Peja - 4 schools, Lipjan - 3 schools, Klina - 2 schools, and Shtime - 2 schools). Then, 6 schools from these cities were selected to participate in the research based on the criterion of the largest number of students per school. On this occasion, 2 schools were selected from the city of Peja (a high school and a vocational school), 2 schools in Lipjan (a high school and a vocational school), 1 school in Klina (a high school)

and 1 school in Shtime (a high school). The total number of students from the 6 schools selected for the survey was more than 5100 [17]. Then, the classrooms from these 6 schools were selected based on stratified sampling by taking the same number of classrooms for each grade in each school. The selection of classrooms was done randomly, taking the classrooms 1 and 5 for each grade. However, the response rate was not the same for each grade, about 80% for the tenth grade, 70% for the 11th grade, and 49% for the 12th grade, and the total rate of responses was 66%. The students from the classes that have been selected to participate in the research have been informed in advance that the survey will be conducted on the specified day, informing them of the survey procedures and that their participation is anonymous, confidential, voluntary, and non-binding, meaning that at any stage they can withdraw from the process [17]. In the end, data were collected from 529 participants, where 4 incomplete responses were excluded from the analysis.

### 2.4. Data Analysis

Data were analyzed using IBM SPSS Statistics software. The analyses included descriptive statistics (means, standard deviations), t-tests for independent samples, one-way ANOVA, Pearson correlation coefficients, and linear regression analyses [18, 19].

Effect sizes were calculated using Cohen's d for t-tests and eta-squared ($\eta^2$) for ANOVA to assess the magnitude of differences and relationships. Cohen's d was used to measure the effect size for differences between the two groups, with values of 0.2, 0.5, and 0.8 indicating small, medium, and large effects, respectively [18]. Eta-squared ($\eta^2$) was utilized to determine the proportion of variance explained by the independent variable, with values of 0.01, 0.06, and 0.14 representing small, medium, and large effects [20].

For the regression analysis, a forced entry method was employed. This method involves entering all predictors into the model simultaneously, enabling the assessment of the unique contribution of each predictor to the variance in Internet addiction [21]. A forced entry method was used for this regression analysis. This method involves entering all predictors into the model simultaneously, allowing for the assessment of the unique contribution of each predictor to the variance in Internet addiction [21].

T-tests and ANOVA were employed to examine differences in Internet addiction and school attachment dimensions across gender, age, academic success, and family income. Pearson correlation analysis assessed the strength and direction of the relationship between school attachment dimensions and Internet addiction. Finally, linear regression analysis was performed to determine the extent to which school attachment dimensions predict Internet addiction [21].

## 3. RESULTS

To determine if there are gender differences in the dimensions of school attachment and internet addiction among high school students, a t-test analysis was conducted, and the results are presented in Table **2**.

The t-test reveals significant gender differences in internet addiction, with female students reporting higher mean scores (X=24.04) than male students (X=20.66) (t=-5.54; p<0.05). The moderate effect size (Cohen's d = 0.52) suggests that female students are more prone to internet addiction, highlighting the need for gender-specific interventions that address the particular online behaviors contributing to this trend among females.

Similarly, in the interest in learning dimension, females scored higher (X=22.78) compared to males (X=20.94) (t=-5.41; p<0.05), with a moderate effect size (Cohen's d = 0.48). This indicates a stronger academic engagement among female students, which could help mitigate the risk of internet addiction. Enhancing academic engagement among male students might be a crucial area of focus to balance this disparity.

No significant gender differences were found in other dimensions of school attachment, such as feelings about school, attitudes toward students, and perception of school. This suggests that gender may not be as influential in shaping these aspects of school attachment, pointing to other factors that might play a more significant role.

**Table 2. T-test results regarding the differences in internet addiction and dimensions of school attachment of high school students according to gender variable.**

| Variables | Gender | n | X | SD | t | p | Cohen's d |
|---|---|---|---|---|---|---|---|
| İnternet addiction | Male<br>Female | 215<br>310 | 20.66<br>24.04 | 6.33<br>7.15 | -5.54 | .00* | 0.52 |
| Feeling about School | Male<br>Female | 215<br>310 | 15.96<br>16.26 | 3.27<br>2.83 | -1.08 | .27 | 0.09 |
| Interest in learning | Male<br>Female | 215<br>310 | 20.94<br>22.78 | 4.40<br>3.30 | -5.41 | .00* | 0.48 |
| Attitudes toward students | Male<br>Female | 215<br>310 | 16.41<br>16.61 | 2.98<br>2.52 | -.78 | .43 | 0.07 |
| Attitudes toward teachers | Male<br>Female | 215<br>310 | 21.64<br>21.96 | 3.84<br>2.92 | -1.04 | .29 | 0.08 |
| Perception of school | Male<br>Female | 215<br>310 | 5.94<br>5.88 | 2.14<br>2.12 | .296 | .76 | 0.03 |

**Note:** Cohen's d: Small effect (0,2), medium effect (0.5), large effect (0.8).

**Table 3. ANOVA results for age differences regarding internet addiction and dimensions of school attachment.**

| Variables | Age | n | F | p | $\eta^2$ (Eta-Squared) |
|---|---|---|---|---|---|
| İnternet addiction | 15 | 90 | 23.07 | 0.199 | 0.939 |
| | 16 | 180 | 22.59 | | |
| | 17 | 161 | 22.66 | | |
| | 18 | 73 | 22.13 | | |
| | other | 7 | 22.14 | | |
| Feeling about School | 15 | 99 | 16.53 | 1,401 | .232 |
| | 16 | 176 | 15.85 | | |
| | 17 | 162 | 16.14 | | |
| | 18 | 73 | 16.37 | | |
| | other | 7 | 14.57 | | |
| Interest in learning | 15 | 100 | 22.77 | 3.866 | .004* |
| | 16 | 178 | 22.39 | | |
| | 17 | 156 | 21.41 | | |
| | 18 | 73 | 21.65 | | |
| | Other | 7 | 18.33 | | |
| Attitudes toward students | 15 | 100 | 16.74 | .710 | .585 |
| | 16 | 178 | 16,64 | | |
| | 17 | 160 | 16.42 | | |
| | 18 | 73 | 16.11 | | |
| | other | 7 | 16.51 | | |
| Attitudes toward teachers | 15 | 100 | 21.08 | .893 | .468 |
| | 16 | 181 | 21.67 | | |
| | 17 | 162 | 21.94 | | |
| | 18 | 73 | 22.11 | | |
| | other | 7 | 19.86 | | |
| Perception of school | 15 | 101 | 5.98 | .275 | .894 |
| | 16 | 180 | 5.98 | | |
| | 17 | 162 | 5.81 | | |
| | 18 | 73 | 5.77 | | |
| | other | 7 | 6.28 | | |

**Note:** Eta-Squared ($\eta^2$): Small effect (0.01), medium effect (0.06), large effect (0.14).

Overall, the results underscore the importance of considering gender when addressing internet addiction and academic engagement. While targeted interventions may be needed to reduce internet addiction among female students, efforts to boost academic interest should particularly focus on male students. This balanced approach could help address the unique challenges faced by both genders.

Furthermore, an analysis of variance (ANOVA) was used to determine if internet addiction and school attachment dimensions vary depending on the age of high school students. The results of this analysis are presented in Table **3**.

The ANOVA results indicate that there are no significant age-related differences in internet addiction, as the F-value of 3.32 ($p > 0.05$) suggests. Similarly, no significant differences were found in most dimensions of school attachment, including feelings about school" ($F = 1.401$, $p > 0.05$), attitudes toward students ($F = 0.71$, $p > 0.05$), attitudes toward teachers ($F = 0.893$, $p > 0.05$), and perception of school ($F = 0.275$, $p > 0.05$).

However, significant age-related differences were observed in the interest in learning dimension ($F = 3.866$, $p < 0.05$). The eta-squared value ($\eta^2$) for this difference suggests a moderate effect size, indicating that age plays a meaningful role in students' interest in learning, with younger students showing slightly higher interest. This finding points to the potential need for age-specific strategies to sustain and enhance academic engagement, particularly as students grow older.

Overall, the hypothesis that significant age differences exist in internet addiction and school attachment dimensions is largely rejected, except for the interest in the learning dimension, where age differences were found to be significant. This highlights the importance of focusing on maintaining students' interest in learning as they age, which could be a key factor in fostering better school attachment and reducing risks like internet addiction.

Additionally, to determine if there are differences in internet addiction and school attachment dimensions concerning academic success, an analysis of variance was performed. The results of this analysis are presented in Table **4**.

The ANOVA results indicate no significant differences in internet addiction concerning academic success (F=2.373, p>0.05). This suggests that students' academic performance does not significantly impact their likelihood of developing internet addiction.

However, significant differences were observed in two dimensions of school attachment: interest in learning (F=8.239, p<0.05) and attitudes toward teachers (F=3.366, p<0.05). The eta-squared values suggest a meaningful impact of academic success on these dimensions, with better academic performers showing higher interest in learning and more positive attitudes toward teachers. This implies that students who excel academically tend to be more engaged in their education and have better relationships with their teachers, which could contribute to a more positive school experience.

No significant differences were found in other dimensions, such as feelings about school (F=0.282, p>0.05), attitudes toward students (F=2.53, p>0.05), and perception of school (F=1.399, p>0.05). This suggests that academic success does not strongly influence these aspects of school attachment.

In conclusion, the hypothesis that academic success influences internet addiction is rejected. However, the hypothesis is partially accepted concerning specific dimensions of school attachment, specifically interest in learning and attitudes toward teachers, where significant differences based on academic performance were found.

Furthermore, an analysis of variance was conducted to determine if there are significant differences in internet addiction and school attachment dimensions concerning family income. The results of this analysis are presented in Table 5.

**Table 4. ANOVA results for academic success differences regarding internet addiction and dimensions of school attachment.**

| Variables | Academic Success | n | F | p | $\eta^2$ (Eta-Squared) |
|---|---|---|---|---|---|
| İnternet addiction | Enough<br>Good<br>Very good<br>Excellent | 36<br>157<br>176<br>156 | 2.43<br>2,41<br>2.63<br>2.52 | 2.373 | .069 |
| Feeling about School | Enough<br>Good<br>Very good<br>Excellent | 36<br>157<br>176<br>156 | 3.15<br>3.24<br>3.24<br>3.22 | .282 | .838 |
| Interest in learning | Enough<br>Good<br>Very good<br>Excellent | 36<br>157<br>176<br>156 | 3.32<br>3.54<br>3.75<br>3.78 | 8.239 | .00* |
| Attitudes toward students | Enough<br>Good<br>Very good<br>Excellent | 36<br>157<br>176<br>156 | 3.20<br>3.21<br>3.35<br>3.33 | 2.53 | .057 |
| Attitudes toward teachers | Enough<br>Good<br>Very good<br>Excellent | 36<br>157<br>176<br>156 | 3.54<br>3.55<br>3.73<br>3.62 | 3.366 | .01* |
| Perception of school | Enough<br>Good<br>Very good<br>Excellent | 36<br>157<br>176<br>156 | 3.11<br>3.06<br>2.91<br>2.84 | 1.399 | .242 |

**Note:** Eta-Squared ($\eta^2$): Small effect (0.01), medium effect (0.06), large effect (0.14).

**Table 5. ANOVA results for family income differences regarding internet addiction and dimensions of school attachment.**

| Variables | Family income per year | n | Mean | F | p |
|---|---|---|---|---|---|
| İnternet addiction | Less than 3000€<br>3000-5999 €<br>6000-9999€<br>10000-19999€<br>More than 20000€ | 113<br>130<br>127<br>90<br>65 | 2.60<br>2,42<br>2.55<br>2.49<br>2.57 | .826 | .448 |

*(Table 5) contd.....*

| Variables | Family income per year | n | Mean | F | p |
|---|---|---|---|---|---|
| Feeling about School | Less than 3000€ | 113 | 3.33 | 2.521 | .04* |
| | 3000-5999 € | 130 | 3.29 | | |
| | 6000-9 999€ | 127 | 3.19 | | |
| | 10000-19999€ | 90 | 3.16 | | |
| | More than 20000€ | 65 | 3.08 | | |
| Interest in learning | Less than 3000€ | 113 | 3.68 | 2.675 | .031* |
| | 3000-5999 € | 130 | 3.69 | | |
| | 6000-9999€ | 127 | 3.75 | | |
| | 10000-19999€ | 90 | 3.68 | | |
| | More than 20000€ | 65 | 3.53 | | |
| Attitudes toward students | Less than 3000€ | 113 | 3.26 | .380 | .823 |
| | 3000-5999 € | 130 | 3.30 | | |
| | 6000-9999€ | 127 | 3.31 | | |
| | 10000-19999€ | 90 | 3.35 | | |
| | More than 20000€ | 65 | 3.27 | | |
| Attitudes toward teachers | Less than 3000€ | 113 | 3.63 | 3.733 | .005* |
| | 3000-5999 € | 130 | 3.71 | | |
| | 6000-9999€ | 127 | 3.67 | | |
| | 10000-19999€ | 90 | 3.63 | | |
| | More than 20000€ | 65 | 3.41 | | |
| Perception of school | Less than 3000€ | 113 | 3.09 | 4.300 | .002* |
| | 3000-5999 € | 130 | 2.98 | | |
| | 6000-9999€ | 127 | 3.07 | | |
| | 10000-19999€ | 90 | 2.92 | | |
| | More than 20000€ | 65 | 2/48 | | |

**Note:** *p<0.05.

The ANOVA results from Table **5** indicate that family income does not significantly influence internet addiction, as no significant differences were found across different income levels (F=0.826, p>0.05). This suggests that students' susceptibility to internet addiction is relatively consistent regardless of their family's income.

However, significant differences were found in several dimensions of school attachment based on family income. Specifically, feelings about school (F=2.521, p<0.05), interest in learning (F=2.675, p<0.05), attitudes toward teachers (F=3.733, p<0.05), and perception of school" (F=4.300, p<0.05) all showed significant variation. These findings suggest that students from lower-income families tend to have slightly lower scores in these dimensions, particularly in the perception of school dimension, where the mean score decreases as family income increases, indicating a more positive perception among students from wealthier backgrounds.

On the other hand, no significant differences were observed in attitudes toward students (F=0.380, p>0.05), indicating that family income does not significantly impact how students view their peers.

In summary, while family income does not appear to affect internet addiction, it does have a meaningful impact on certain aspects of school attachment, particularly in how students feel about school, their interest in learning, their attitudes toward teachers, and their overall perception of school. This underscores the importance of considering socio-economic factors when developing interventions aimed at improving school attachment and reducing disparities among students from different economic backgrounds.

To test the second hypothesis and to determine if there is a significant negative correlation between overall school attachment and Internet addiction among high school students in Kosovo, the Pearson correlation analysis was conducted, and the results are presented in Table **6**.

The Pearson correlation results in Table **6** revealed significant, though weak, negative correlations between internet addiction and four dimensions of school attachment. Specifically, as internet addiction increases among high school students in Kosovo, their feelings about school (r=-0.283, p<0.01), interest in learning (r=-0.138, p<0.01), attitudes toward teachers (r=-0.123, p<0.01), and perception of school (r=-0.274, p<0.01) decrease. These correlations suggested that students more addicted to the internet tend to have weaker attachments to these aspects of their school experience.

However, the relationship between internet addiction and the dimension of attitudes toward students is very weak and not statistically significant (r=0.058, p>0.05). This indicates that internet addiction does not significantly influence how students view their peers, unlike the other dimensions of school attachment.

But if we see what is the overall correlation between school attachment and internet addiction, the results show a significant negative correlation (r=-0.211, p<0.01). This correlation suggests that students who are more addicted to the internet tend to have a weaker overall attachment to the school.

**Table 6. Correlation coefficient results between' internet addiction and dimensions of school attachment.**

| - | | Feeling about School | Interest in Learning | Attitude to Students | Attitude to teachers | Students' Perception of School | Overall School Attachment |
|---|---|---|---|---|---|---|---|
| Internet addiction | Pearson Correlation | -,283** | -,138** | ,058 | -,123** | -,274** | -.211** |
| | Sig. (2-tailed) | .000 | .003 | .232 | .001 | 000 | ..000 |
| | N | 525 | 525 | 525 | 525 | 525 | 525 |

**Note:** **p<0.01.

**Table 7. Results of regression analysis on whether school attachment dimensions are negative predictors of internet addiction of high school students.**

| Model | B | Sth. Error | (ß) | T | P |
|---|---|---|---|---|---|
| Constant | 3.44 | 0.266 | - | 12.921 | .000* |
| Feeling about School | -0.306 | 0.063 | -0.237 | -4.867 | .000* |
| Interest in Learning | 0.018 | 0.062 | 0.015 | 0.299 | 0.772 |
| Attitude to Students | 0.15 | 0.063 | 0.106 | 2.368 | .018* |
| Attitude to Teachers | -0.02 | 0.072 | -0.014 | -0.276 | 0.783 |
| Students' Perception of School | -0.143 | 0.035 | -0.195 | -4.124 | .000* |
| R = .365 | $R^2$ = .133 | F=15.953 | p = .000 | - | - |

**Note:** a. Dependent Variable: Internet Addiction.

Thus, the second hypothesis, which proposed that there would be significant negative correlations between internet addiction and overall school attachment, is largely supported. This finding highlights the complex nature of the relationship between internet use and students' attachment to their school environment, suggesting that while internet addiction negatively impacts many aspects of school attachment, it may not influence peer relationships in the same way.

To test the third hypothesis and to determine if specific dimensions of school attachment are negative predictors of internet addiction, a linear regression analysis was conducted, and the results are presented in Table 7.

For the linear regression analysis, a forced entry method was employed, and results in Table 7 demonstrate a significant model (F=15.953, p<0.001) explaining 13.3% of the variance in internet addiction ($R^2$ = 0.133) through the dimensions of school attachment. This indicates that while school attachment does influence internet addiction, the majority of the variability in internet addiction is likely due to other factors not captured by the model.

Among the school attachment dimensions, feelings about school (ß=-.306, T=-4.867, p<0.001) and students perception of school (ß=-.143, T=-4.124, p<0.001) were significant negative predictors of internet addiction. This means that lower levels of attachment in these areas are associated with higher internet addiction. These findings suggest that students who do not feel connected to or positively perceive their school environment are more likely to develop problematic internet use behaviors.

Interestingly, attitudes toward students (ß=.150, T=2.368, p<0.01) were a positive predictor, indicating that more positive attitudes toward peers are correlated with higher internet addiction. This could imply that students with strong social connections at school might engage more in online interactions, potentially leading to increased internet use.

The other dimensions, interest in learning (ß=0.018, T=0.299, p>0.05) and attitudes toward teachers (ß=-0.02, T=-0.276, p>0.05), did not significantly predict internet addiction, suggesting that these aspects of school attachment do not strongly influence students' internet use.

In conclusion, the third hypothesis is partially accepted: while certain dimensions of school attachment, such as feelings about school and students' perceptions, significantly predict internet addiction, others, like interest in learning and attitudes towards teachers, do not. The results indicate that although school attachment influences internet addiction, other factors might play a more critical role, underscoring the need for further research to identify additional predictors.

## 4. DISCUSSION

This study provides valuable insights into the relationship between school attachment and Internet addiction among high school students in Kosovo, highlighting how students' connections to their school environment can significantly influence their online behaviors. The results demonstrate significant differences in Internet addiction and school attachment based on socio-demographic factors such as gender, age, academic success, and family income.

For instance, the data suggest that boys are more likely to struggle with Internet addiction compared to

girls, who generally exhibit stronger school attachment. This gender difference is consistent with previous research, which indicates that boys might be more prone to engaging in risky online activities, such as gaming, which can lead to addiction [22, 23]. Additionally, the study reveals that students with higher academic achievement tend to have lower levels of Internet addiction, suggesting that active engagement in school can serve as a protective factor against excessive Internet use. High-achieving students may possess better time management skills and a stronger commitment to their academic responsibilities, reducing their vulnerability to unhealthy online habits [24].

While age and family income also play a role, their effects appear to be less pronounced. Younger students exhibited slightly higher levels of Internet addiction, likely due to their greater susceptibility to peer influence and less developed self-regulation skills [25]. The impact of family income on Internet addiction was minimal; however, students from lower-income families reported marginally higher levels of addiction, potentially due to factors such as reduced parental supervision or using the Internet as a coping mechanism for financial stress [26].

Moreover, the study found that students who feel more connected to their school are less likely to develop Internet addiction. This supports the notion that strong bonds with social institutions such as schools can help deter students from engaging in problematic online behaviors. When students feel secure and valued within their school environment, they are less likely to seek solace in potentially harmful online activities. This is consistent with recent findings that emphasize the protective role of school connectedness in reducing the risk of Internet addiction among adolescents [27, 28]. These results suggested that enhancing students' attachment to their school could be an effective strategy to mitigate Internet addiction. For instance, fostering a positive school climate, promoting strong student-teacher relationships, and encouraging participation in school activities can create a sense of connection and belonging, thereby reducing students' reliance on the Internet for comfort.

However, the study further revealed that not all aspects of school attachment influence Internet addiction uniformly. Specifically, students' feelings about their school and their interest in learning were identified as significant factors, suggesting that students who have a positive school experience and a genuine interest in learning are less likely to use the Internet as a form of escape. For those who enjoy school and are engaged in their studies, the school environment provides a sense of satisfaction that diminishes the need to seek fulfillment online. Conversely, students who lack interest in their studies or do not feel positively about their school may be more prone to excessive Internet use as a way to compensate for these deficiencies [29]. This finding underscores the importance of addressing both the emotional and motivational aspects of school attachment in efforts to prevent Internet addiction.

These findings suggest several practical steps that schools and policymakers can take to help reduce Internet addiction among students. Schools should prioritize programs that enhance students' emotional and motivational connections to the school environment. Implementing social-emotional learning (SEL) programs, which promote strong interpersonal relationships and foster a positive school climate, could be particularly effective in this regard [30]. Additionally, teachers and school counselors play a crucial role in this effort; they should be trained to recognize the signs of Internet addiction and understand how it relates to students' feelings about school. By identifying students who may be at risk, educators can provide targeted support, such as counseling or peer support groups, to help these students develop healthier online habits. Furthermore, policies that encourage balanced Internet use, both inside and outside the classroom, can contribute significantly to reducing Internet addiction.

## CONCLUSION

This study offers significant insights into the relationship between school attachment and Internet addiction among high school students in Kosovo, underscoring the importance of socio-demographic factors and specific dimensions of school attachment in understanding and addressing Internet addiction in adolescents.

The study revealed statistically significant gender differences in Internet addiction, with female students reporting higher mean scores (X=24.04) than male students (X=20.66). The effect size for this difference was moderate (Cohen’s d = 0.52), indicating that gender is an important factor in Internet addiction, with females being more susceptible. Similarly, significant gender differences were observed in the “interest in learning” dimension of school attachment, with females again reporting higher scores (X=22.78) compared to males (X=20.94), with a moderate effect size (Cohen’s d = 0.48). These findings suggest that gender-specific strategies may be needed to address Internet addiction effectively.

Significant differences were identified in the “interest in learning” dimension concerning the age of the students ($F=3.866$, $p<0.05$), with older students reporting lower levels of interest. However, no significant differences related to age were found in other dimensions of school attachment or Internet addiction, highlighting a potential decline in academic motivation as students’ age, which could be a key target for interventions aimed at sustaining school engagement.

While no significant differences were observed between Internet addiction and students' academic success, significant relationships were found between academic success and two dimensions of school attachment: “interest in learning” ($F=8.239$, $p<0.05$) and “attitudes toward teachers” ($F=3.366$, $p<0.05$). These findings imply that students who are more academically successful tend to be more engaged in their learning and have more positive attitudes toward their teachers, which may indirectly reduce the risk of Internet addiction.

The analysis showed no statistically significant differences in Internet addiction related to family income; however, significant differences were observed in four dimensions of school attachment: “feelings about school” ($F=2.511$, $p<0.05$), “interest in learning” ($F=2.675$, $p<0.05$), “attitudes towards teachers” ($F=3.733$, $p<0.05$), and “perception of school” ($F=4.300$, $p<0.05$). These results suggest that while family income may not directly influence Internet addiction, it plays a role in shaping students' attachment to school.

The study identified a weak but statistically significant negative correlation between Internet addiction and four dimensions of school attachment: “feelings about school” ($r=-0.283$, $p<0.01$), “interest in learning” ($r=-0.138$, $p<0.01$), “attitudes towards teachers” ($r=-0.123$, $p<0.01$), and “perception of school” ($r=-0.274$, $p<0.01$). This indicates that students with weaker school attachments are more likely to experience higher levels of Internet addiction, underscoring the protective role of a strong school connection in preventing unhealthy online behaviors.

Furthermore, regression analysis demonstrated that three of the five dimensions of school attachment are significant predictors of Internet addiction. Specifically, “feelings about school” ($ß=-0.306$, $T=-4.867$, $p<0.001$) and “students' perception of school” ($ß=-0.143$, $T=-4.124$, $p<0.001$) negatively predicted Internet addiction, while “attitudes towards students” ($ß=0.150$, $T=2.368$, $p<0.01$) positively predicted it. The overall model explained 13.3% of the variance in Internet addiction ($R^2=0.133$), suggesting that while school attachment plays a role, other factors also contribute to this behavior.

These findings highlighted the critical importance of school attachment in addressing Internet addiction among adolescents. Interventions aimed at enhancing students' emotional and motivational connections to school-particularly through fostering positive feelings about school and increasing interest in learning-can significantly reduce the risk of Internet addiction. Schools should consider implementing social-emotional learning (SEL) programs that promote these aspects of school attachment.

Given the gender and age-related differences identified in this study, tailored interventions that address the specific needs of different student groups are recommended. For instance, strategies that engage older students and maintain their interest in learning could help mitigate the decline in school attachment seen with age. Additionally, recognizing the role of academic success and teacher-student relationships in promoting school attachment can guide the development of more comprehensive prevention strategies.

## LIMITATIONS AND FUTURE RESEARCH

The data collected in the school year 2022–2023, after the Covid-19 pandemic, presents several limitations. The pandemic's negative impact on school attachment and internet addiction is a significant factor. Remote work, distance education, and online socialization during the quarantine period led to increased internet addiction and weakened connections with schools. The reliance on the Internet for information, entertainment, and essential services during the pandemic may have further exacerbated internet addiction. It is important to recognize that the effects of the pandemic on school attachment and internet use are complex and may continue to evolve as societies adapt to new circumstances.

Another limitation is the non-representative sample of secondary schools in Kosovo, which hinders the generalization of the findings to all secondary schools in the country. However, the sample is representative of the selected cities and schools where the questionnaires were administered.

Furthermore, the gender distribution of the participants (59% female, 41% male) does not align with the demographic composition of secondary schools in Kosovo, where there are more male students. Additionally, the voluntary nature of participation and the lower response rate from $12^{th}$-grade students are further limitations.

These limitations should be considered when interpreting the findings of the study. Future research should address these limitations using representative samples and considering the evolving nature of internet use and school attachment in the post-pandemic context.

## AUTHORS’ CONTRIBUTIONS

The authors confirm their contribution to the paper as follows: AM collected the data, and EB wrote the paper. All authors reviewed the results and approved the final version of the manuscript.

## LIST OF ABBREVIATIONS

| | | |
|---|---|---|
| ANOVA | = | Analysis of Variance |
| SEL | = | Social-Emotional Learning |

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval was obtained from the Code of Ethics for scientific research of the AAB College in Prishtina, Kosovo, with protocol number 271/23.

## HUMAN AND ANIMAL RIGHTS

All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committees and with the 1975 Declaration of Helsinki, as revised in 2013.

## CONSENT FOR PUBLICATION

Informed consent was obtained from the guardians of adolescents.

## STANDARDS OF REPORTING

STROBE and SAGER guidelines were followed.

## CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

## FUNDING

None.

## AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of this article are available in the Mendeley Data repository at: https://data.mendeley.com/datasets/syf3v93tfy/5, and DOI: 10.17632/syf3v93tfy.5.

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