Conditional indirect effects of gender and school on internet use for academic activities and social-moral development among secondary school students in Nigeria

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Abstract: Social networking sites (SNS) are becoming platforms for educational activities and thereby facilitating student–student and student–teacher academic and social interaction. Do these dynamics influence adolescent students’ social and moral development and if they do, by what mechanism? This study depicts the moderated effects of gender and school on the relationship between students’ use of internet for academic activities and their social and moral development which was mediated by SNS-use. Locally adapted and standardised questionnaires were administered to 637 adolescent students (Mean age = 15.98; Range = 14–18 years; Females = 68.3%). Conceptual models positing moderated mediated relationships were used to test the study’s hypotheses. First, findings showed that SNS-use...
mediated the relationship between students’ use of internet for academic activities and their social-moral development; and gender moderated these indirect effects (Process model 58). Second, the type of school moderated one indirect path in the mediated relationship between students’ use of internet for academic activities and their social-moral development through SNS-use (Process model 7). These findings suggest that it is SNS-use by adolescent students that engenders internet use for academic activities and this fosters their social-moral development, but this is more pronounced among male adolescent students and among those from public schools. The implications are discussed and recommendations made.

**Subjects:** Social Psychology; Developmental Psychology; Educational Psychology

**Keywords:** Adolescent students; gender; internet use for academic activities; moral development; school type; social development; social networking sites use

### 1. Introduction

In Nigeria, the use of social networking sites (SNS) is burgeoning among adolescents, especially those still in senior secondary school. This trend has long been observed in technologically advanced nations of the globe. According to Ahn (2011), the use of SNS is abounding among teenagers who form the core of adolescence. Adolescents are in transition from childhood to early adulthood, which starts approximately at 10–12 years of age and ends at 18–22 years of age (Santrock, 2006), and these adolescents are highly impressionable. A fundamental objective of using social networking sites should be to foster and develop adolescents’ social relationship and moral behaviour.

Internet use is a multifaceted construct because of its diverse interactive nature. This has been rightly pointed out by Blank and Groselj (2014) who identified varying types of internet use. Internet use for schoolwork or academic activities was one dimension which was specified. Internet use provides access to SNS through the social media. Social media has been defined by Feng et al. (2019) as online community-based platforms that enable people to engage in networking, messaging, and/or creating (e.g., posting, tweeting, blogging), tagging, exchanging, evaluating (e.g., liking, commenting, voting, rating), and sharing content. SNS is a constituent or part of a collection of Web applications also referred to as social media (Ahn, 2011). These websites (called Web 2.0 applications or tools) are fashioned to depend on the input of bulk collection of users instead of content being provided from a controlled-centralised source; it amasses and remixes content from several sources; and hugely connects users and content together (O’Reilly, 2007).

Christofferson (2016), after a review of some studies on the effects of SNS use among teens and adolescents, submitted that it has both benefits and risks. For example, Diomidous et al. (2016) and Spies Shapiro and Margolin (2014) explicated the consequence of SNS use on adolescents’ psychosocial development. Meanwhile, it has been reported that SNS use have immensely improved adolescents’ social and emotional lives and thus has enormous influence on their development process (Ahn, 2011; Hur & Gupta, 2013). Relatedly, it has been found that SNS use among adolescent students is associated positively (Ekechukwu, 2017) and negatively (Kirschner, 2015) with their academic performance.

In addition, gender differentials have been identified in the use of and attraction to SNS (Misra et al., 2015). For instance, Facebook as an SNS is being used by female adolescents to maintain extant relationships, academic activities, finding old friends and monitoring specific agenda, but they try to conceal their identities and personal information to keep their privacy. Male adolescents...
use it for making new relationships, networking, seeking new dates and playing games (Mazman & Usluel, 2011; Muscanell & Guadagno, 2012).

The ubiquitousness of the internet, the attendant use of SNS among the youths and the potential it presents for educational instruction makes it desirable for educators to use these platforms as learning facilitators for their students. And the use of online educational resources has been found to improve student-teacher connectedness, among other benefits (Alshahrani et al., 2017). Therefore, SNS use ought to be a source of moral and social development for adolescents; and likewise, its use for academic purposes ought to be encouraged. The relationship among these variables ought to be depicted as scant literature exists on this aspect of SNS-use and adolescents’ development.

Interestingly, it is yet to be demonstrated whether the use of internet for academic purpose has an effect on the social and moral development of adolescents through the use of SNS. And whether this relationship is contingent on the gender of the adolescent and the type of senior secondary school such adolescent attends. This research attempts to proffer answers to these questions and fill an interstice in knowledge on adolescents with the focus on senior secondary school students and SNS.

Valkenburg and Verbeek (2013) believed that given the theory of moral development by Kohlberg (1984), human-technology interaction can enhance moral development. Willard (1997) raised several issues concerning the impacts internet use and cyberspace can have on the moral development of the youth. Unlike many studies, this research anticipates that SNS use and internet use for educational purposes can have a positive effect on the social and moral development of adolescent senior secondary school students.

Students’ use of SNS has been shown not to have a significant correlation with academic performance both in a technologically developed nation (Kolek & Saunders, 2008; Paul & Gelish, 2011) and a less technologically developed nation (Akanbi et al., 2014). Conversely, in some studies, SNS use has been reported to be related to students’ academic performance (Ekechukwu, 2017). Sharma and Vishvakarma (2016) reviewed several sources of literature on the influence of social networking sites on academic performance. They concluded that there are positive as well as the negative effects of SNS use on academic performance of students since the social media are sometimes engaged for educational purposes and sometimes for non-academic purposes. Liu et al. (2017) used a meta-analysis and reported that SNS use is inversely related to grade point average (GPA); and is positively related to use of language; and the SNS use and GPA negative relationship was stronger among females and college students.

But is SNS use related to internet use for academic purposes? SNS and other Web 2.0 tools have been reported to create a positive effect when used for educational purposes, especially among teachers (Bicen & Uzunboylu, 2013). Guraya et al. (2018) showed that SNS are used for educational purposes among medical students. Badri et al. (2016) examined the usage of social media devices and applications among students in Abu Dhabi and found that students used social media mainly for keeping contact with friends and family and for learning purposes. Therefore, internet use for academic activities could be expected to relate to SNS use, and SNS use could be expected to relate to students’ social and moral development. In addition, SNS use could mediate (or have indirect effects on) the relationship between internet use for academic activities and social-moral development.

Badri et al. (2017) found that there is a reciprocal relationship between learning from SNS and perceived educational performance among students. SNS have been reported to be used for academic purposes (Tartari, 2015) and females have been found to use SNS more (Mazman & Usluel, 2011). Gender differences have also been found in SNS use for project managers seeking employment (Sander et al., 2016). Dufour et al. (2016) also showed gender differences in internet use and associated problems among high school students.
Therefore, because literature suggests there is gender disparity in SNS use and its attendant consequences, it is expected that gender will play a moderating role in the mediated relationship between internet use for academic activities and students’ social-moral development:

**Hypothesis One**: Gender will moderate the SNS-use mediated relationship between internet-use for academic purpose and students’ social development.

**Hypothesis Two**: Gender will moderate the SNS-use mediated relationship between internet-use for academic purpose and students’ moral development.

The provision of computers and other internet facilities and enlightenment about their uses vary between public and private secondary schools in Nigeria. The private schools have been reported to have more information and communications technology (ICT) facilities (Olatokun & Folaranmi, 2008). However, Ukpebor and Emwanta (2012) stated that these are not being utilised in private schools. The fact that there is a differential in the availability and usage of ICT devices among private and public schools could influence adolescent students’ use of these facilities for academic activities and impact differently on their social and moral development.

Therefore, because there is a difference in the availability of internet facilities in public and private schools, and SNS use being pervasive among adolescent students, they will use this media for academic purposes and it will in turn impact their social and moral development and type of school will moderate this mediated relationship (especially the path between internet use for academic activities and SNS use).

**Hypothesis Three**: School type will moderate the SNS-use mediated relationship between internet-use for academic purpose and students’ social development.

**Hypothesis Four**: School type will moderate the SNS-use mediated relationship between internet-use for academic purpose and students’ moral development.

2. Method

2.1. Design
The study is a correlational research which adopted a moderated mediated statistical technique to answer its research hypotheses. This technique facilitates the assessment of conditional indirect effects which is the focus of the study’s objectives. Indirect effects refer to the mediated path(s) by a variable (M) in the relationship between two variables (X & Y). It is research worthy to know the mechanism through which internet use for academic activities transmits its effect on the social and moral development of students; and few conditions under which this takes place. This study hypothesised that the transmission is through SNS use and also tested two conditions or factors (gender and school) that moderate this transmitted or indirect effect(s). The goal of a moderated mediation statistical technique or conditional process analysis which assesses conditional indirect effects is to empirically measure and test hypotheses about the dependent nature of the mechanisms by which a variable (X) exerts its influence on another variable (Y) (Hayes, 2018).

2.2. Participants
A total of 637 senior secondary class one and two students in North-Central Nigeria were surveyed (only classes one and two were used because class three had finished their final year examinations and were no longer in school at the time data were gathered). Students in senior secondary classes effectively capture the core age range for adolescents.

2.3. Sampling techniques
The stratified sampling technique was used to select 18 secondary schools (10 public and 8 privately owned secondary schools) from six states in North-Central Nigeria. During the data collection stage,
letters of introduction of the researchers were obtained from their institutions and presented to the administrators of the selected secondary schools indicating the purpose of the study. Representatives of the school administrators read through the content of the questionnaire to certify its suitability and appropriateness for their students. Then, a systematic sampling technique (every third student on the class list) was used to choose participants after the school administrators and students had given their consent to be part of the research. The class teachers administered the questionnaires to the students as they would have during a test or examination but in the presence of (at least one of) the researchers. The filling of the questionnaires took less than 40 min. No student’s name or any means of identification was required (on the questionnaire) to ensure anonymity of respondents and confidentiality of the information provided.

2.4. Instruments

The instrument used in this study is a locally adapted Social Networking Sites and Adolescents Social and Moral Development Questionnaire (SNsASMQ). It was adapted from Ashiekpe and Mojaye (2017) and Eke et al. (2014). Examples of items measuring influence of SNS-use on social development (15 items; all were directly worded) and moral development (13 items; 2 of which were reversed scored) are: “social networking sites facilitate my participation in social life” and “social networking sites facilitate my good disposition”, respectively. Responses were provided on a 5-point Likert scale ranging from “strongly agree” (5) to “strongly disagree” (1). The summation of these responses provided indexes or metrics for social and moral development.

Examples of items on SNS-use (seven items; all were directly worded) and internet use for academic purpose (six items; all were directly worded) are: “I use SNS to interact with my friends” and “I download reading materials on each of my subjects online”, respectively. Responses were provided on a 4-point Likert scale ranging from “to a large extent” (4) to “not at all” (1). The summation of these responses provided scores which indicated the two variables. The Cronbach alphas α for responses on social development and moral development were .78 and .81, respectively. That of SNS-use was α = .69 and internet use for academic purpose was α = .73. These are acceptable indexes of internal consistency. The items also had good face validity and the authors reported satisfactory construct validities.

2.5. Data analysis

The data gathered were analysed using SPSS (Version 21) and the hypotheses were tested using process statistical software developed by Hayes (2018)—a plug-in or add-on for SPSS—and it is used to assess conditional indirect and direct effects or moderated mediation and mediated moderation. It uses the principles of ordinary least squares (OLS) regression to establish inherent relationships (coefficients) among variables. Ordinary least squares (OLS) uses unstandardised regression coefficients to indicate the strength of relationship between variables.

To determine suitable sample size for the study, recourse was made to the prescriptions of the type I error rates and statistical power associated with varying sample sizes when testing moderated mediated or conditional indirect effects hypotheses by Preacher et al. (2007) using simulated data. According to Fritz et al. (2015), calculating the required sample size for a certain power level in (moderated) mediation hypotheses is more complex and laborious than for many other statistical analyses because the ability to detect both (paths) a and b must be factored in. For this reason, most power analysis software does not directly compute power for (moderated) mediation hypotheses, which is why most of the previous work on statistical power in (moderated) mediation has been done using simulations (Fritz et al., 2015). To this end, the table derived by Preacher et al. puts the statistical power of a moderated mediated analysis with a minimum sample of 500 for Model 58 at greater than .990 and that of Model 7 at greater than .910 (1-β or 1 minus the probability of making a type II error). These values exceed the minimal recommendation of .80.

From those surveyed, not all responses were analysable because Process statistical software does not accommodate missing or incomplete data; hence, 49 cases (responses) were deleted.
from the analyses of hypotheses one and three. This made the sample size for these hypotheses to be 588. Similarly, 25 cases were deleted from the analyses of hypotheses two and four, thereby reducing the sample size for the two hypotheses to 612.

3. Results
The aim of this study was to demonstrate the moderating influence of gender and school type on the relationship between adolescent students’ use of internet for academic purposes and their socio-moral development that is being produced by their use of SNS. The sample’s mean age equals 15.98; range is 14–18 years; standard deviation is 1.17; females are 68.3%; while 73.9% are from public schools.

Figure 1 depicts the path diagram for the relationship proposed by hypothesis one and the corresponding unstandardised OLS regression coefficients obtained. The hypothesis states that: Gender will moderate the SNS-use mediated relationship between internet-use for academic purpose and students’ social development.

The way to probe or examine conditional indirect effects or moderated mediation has been prescribed by Hayes (2015). The results obtained from the analyses or hypotheses testing (see appendix) provide indexes of moderated mediation and the 95% confidence interval of these values. According to Hayes (2015), if the confidence interval is not straddled by zero within its lower and upper limits, then the moderated mediation or conditional indirect effect is significant.

The index of moderated mediation obtained for hypothesis one is −.4320 with 95% confidence interval ranging from −.6631 to −.1930. Zero as a value does not fall within this range which suggests that the index is significant and there is a conditional indirect effect. Hypothesis one is supported. Gender of student moderates the indirect effects of internet use for academic activities on students’ social development through SNS-use. The indirect effects are more pronounced for the male students than the female students.

Figure 2 shows the path diagram obtained after hypothesis two was tested. The hypothesis states that: Gender will moderate the SNS-use mediated relationship between internet-use for academic purpose and students’ moral development.

The index of moderation mediation is −.2504 with 95% confidence interval ranging from −.4509 to −.0528. This range does not include zero; therefore, hypothesis two is supported. The indirect effects of internet use for academic activities on students’ moral development through SNS-use are dependent on gender. These effects are stronger for male students than female students.

Figure 1. Statistical model (58) of moderated mediation of students’ social development by gender.
Figure 2. Statistical model (58) of moderated mediation of students’ moral development by gender.

Note: $a_1$ and $b_1$ are unstandardised regression coefficients of the indirect (effects) paths between $X$ and $Y$ through $M$; $c’$ is the unstandardised regression coefficient of the direct (effect) path between $X$ and $Y$; $a_2$ is the unstandardised regression coefficient of the direct (effect) path between $W$ and $M$; $a_3$ is the unstandardised regression coefficient of moderated mediated (conditional indirect effect) path between $X$ and $M$ by $W$; $b_2$ is the unstandardised regression coefficient of the direct (effect) path between $W$ and $Y$; $b_3$ is the unstandardised regression coefficient of the moderated mediated (conditional indirect effect) path between $M$ and $Y$ by $W$; $^*$ $p < .05$.

Figure 3 shows the path diagram derived from the testing of hypothesis three which states that: School type will moderate the SNS-use mediated relationship between internet use for academic activities and students’ social development.

The index of moderated mediation obtained from the conditional process analysis using Model 7 (Hayes, 2012) is −.0695 with 95% confidence interval (−.1451 to −.0172). In this case, there is no zero in the range of the confidence interval. Therefore, it can be said that the indirect effect of internet use for academic activities on students’ social development through SNS-use depends on school.

Figure 3. Statistical model (7) of moderated mediation of students’ social development by school.
Figure 4 represents the path diagram derived from the testing of hypothesis four which states that: *School type will moderate the SNS-use mediated relationship between internet use for academic activities and students' moral development.*

The index of moderated mediation obtained from the conditional process analysis using Model 7 is $-0.0796$ with 95% confidence interval ($-0.1557$ to $-0.0215$). Zero does not lie between the lower and upper limit of the confidence interval; therefore, there is a significant conditional indirect effect. It can be concluded that the indirect effect of internet use for academic activities on students' moral development is contingent on whether the school is public or privately owned.

Specifically, it was found that for both the social and moral development hypotheses, the (indirect effect) relationship observed between internet use for academic activities and SNS-use was stronger for students in public schools.

The findings in this study show that the relationship between internet use for academic activities and students' social and moral development was produced or mediated by SNS-use. These mediated relationships were moderated by students' gender and the type of school students attended. That is, the indirect effects were stronger for male students than female students; and more pronounced in public schools and less among those in private schools. The moderation by school only took place on the internet use for academic activities and SNS-use path, which is the Model 7 of the moderated mediation or conditional indirect effect models in conditional process analysis (Hayes, 2018). Meanwhile, gender moderated the two indirect effects (Model 58), that is, the path between internet use for academic activities and SNS-use; and SNS-use and social-moral development. These results provided support for all the study's hypotheses.

4. Discussion
By inference, this study shows that the appropriate use of SNS for academic purposes does benefit students' moral and social development. The positive correlations observed among these variables buttress this submission. The depiction shows that when SNS is engaged for the right intent it does enhance and facilitate the social and moral development among adolescents. The data gathered revealed a positive relationship between internet use for academic purposes and social...
development. The same was observed in respect to moral development. SNS use was also positively significantly related to both students’ social and moral development.

The use of the internet extends beyond its provision of entertainment and social connection for individuals, it also provides opportunity for educational interactions, purposes and academic activities among students (Dogruer, Eyyam, & Menevis, 2011). And, social media is now being deployed for educational purposes (Vivakaran & Neelamalar, 2018). Internet use for academic or educational purpose has been linked to students’ use of social networking sites (Tartari, 2015). This present study has provided results that also identify this relationship—that students’ use of the internet for academic activities is associated with their use of SNS.

Gender variations have been a recurring factor in social media usage and by extension SNS-use research (Feng et al., 2019; Su et al., 2019), and this study is not an exception as it found gender to be a significant moderator of the mediated relationships between internet use for academic purpose and students’ social and moral development through SNS use. Gender differences are replete on the effect of SNS-use in literature and this study also reflected this, but with a different shade. Research such as that by Mazman and Usluel (2011) suggests that females use SNS for interpersonal purpose, maintaining and keeping friends, which are somewhat different from what the males use SNS for, and so the resultant differentials in how it impacts their social and moral development.

The SNS-use mediating effect on internet use for academic purpose and students’ social and moral development works differently for male and female adolescent students. This mediating effect is more potent for male students and less for female students. This pattern of finding substantiates Alnjadat et al.’s (2019) suggestion that male students are more dependent on social media usage. This position differs from Booker et al. (2018) who reported that females between the ages of 10–15 years engage more in social media interaction than their male counterparts. This was observed in a UK sample and age among other factors could be responsible for the variations in the two studies. To this end, Su et al. (2019) in a meta-analysis opined that these gender variations are mixed and depend on several factors among which is culture.

Adolescent students are conversant and well acquainted with the value of SNS use for their academic pursuit and that it has the potential to advance their social and moral lives. Weber (2012) did remark that SNS use for educational purpose is beneficial to great extent. Research on ICT availability in Nigerian secondary schools does suggest that privately owned secondary schools have more computer laboratories but no internet accessibility (Ukpebor & Emwanta, 2012). And other than the inadequate access to internet facilities adolescent students have in (public) schools, the use of mobile phones, household internet facilities and public internet cafes are common among them (Yebowaah, 2018).

In line with the results of this study, it is possible that students in public schools avail themselves of use of internet services outside of school environment. A plausible reason why the moderated effect is less for adolescent students in private schools is that privately owned secondary schools have more boarding house facilities and are usually in remote areas and therefore their access to the internet is somewhat limited.

Therefore, school administrators will do well to put in place internet infrastructures and facilities at school premises to enable students to have access to internet and SNS. This is important because students spend a great amount of time within the school environment which provides more room for social interactions and moral growth (than the home environment), especially as teachers and peers are present to give learning instructions, guidance and interfacing. The pervasiveness of social media renders SNS as both a veritable source and effective vehicle for the transmission of moral values and social development within the education system.
Another implication of the findings of this study is that students in government-owned senior secondary schools, especially in the region where this study took place, make more use of SNS for academic activities, probably because they have more accessibility to internet facilities than their counterparts in privately owned senior secondary schools but this does not mean they do these activities while in the school. The convention is that some government schools seem to be less funded than privately owned schools and therefore might not be able to provide basic internet platforms for its students. Since SNS and e-learning outlets offer anywhere and anytime educational instructions and activities, adolescent students in public schools probably resort more to social media.

5. Conclusions
Given the findings of this study, it seems that female adolescent students derive their social and moral development from the usage of SNS for other functions and factors that are plausibly different from academic purposes. But this is not within the scope of this present study. The limitation of this study is that it did not consider how the use of internet for other purposes than academic activities can influence the social and moral development of adolescent students. The study cannot claim causality among the variables studied. Also, the study’s sample only consisted of students within two senior secondary classes (and within the age range of 14 years to 18 years). Further studies can be conducted to exceed these restrictions.

6. Recommendations
It is being recommended that the government should fund secondary schools to provide ICT facilities and encourage both students and teachers to engage more in the use of the internet and educationally inclined SNS when learning and teaching, respectively. If done appropriately, this has the potential to foster the social and moral development of the students. The male adolescent students should be encouraged to use the internet for academic activities and engage SNS for academic purpose too as this has been demonstrated to affect their social and moral development positively.

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Appendix

Table A1. (Compare with Figure 1): Unstandardised ordinary least squares regression model coefficients of moderated mediation of students’ social development by gender

| Predictor                          | Model 1 | | |             | Model 2 | | |             |
|-----------------------------------|---------|---|---|-------------|---------|---|---|-------------|
|                                   | Coefficient | SE | P  |                 | Coefficient | SE | P  |             |
| Intercept (Constant)              | ln       | 4.9629 | 3.0868 | .1084 | ln         | 30.5490 | 5.5619 | .0000 |
| Internet Use for Academic Purpose (X) | a1      | .9279 | .1601 | .0000 | c’         | .2121 | .0826 | .0105 |
| Gender (W)                        | a2      | 1.6447 | 1.6625 | .3230 | b2         | 8.5390 | 3.0048 | .0046 |
| Internet Use for Academic X Gender (XW) | a3      | -.1515 | .0876 | .0842 | -          | -      | -      | -          |
| Social Networking Sites’ Use (M)  | -       | -      | -      | b3       | 1.2677 | .2609 | .0000 |
| Social Networking Sites’ Use X Gender (MW) | b3     | -.5069 | .1411 | .0004 |
| Model R² = .3941                  |         |       |       | Model R² = .1583 | F(3,584) = 126.6040 | F(4,583) = 27.4088 |
| Index of Moderated Mediation      | -.4320  | .1195 | -5%CI Lower Limit | -.6631 | -5%CI Upper Limit | -.1930 |
Table A2. (Compare with Figure 2): Unstandardised ordinary least squares regression model coefficients of moderated mediation of students’ moral development by gender

| Outcome                  | Model 1                          | Model 2                          |
|--------------------------|----------------------------------|----------------------------------|
| Social Networking Sites’ Usage (M) | Students’ Moral Development (Y) |
| Predictor                | Coefficient | SE | P    | Coefficient | SE | P    |
| Intercept (Constant)     | $\beta_m$      | 5.3369 | 3.0353 | .0792 | $\beta_y$      | 14.9256 | 4.6795 | .0015 |
| Internet Use for Academic Purpose (X) | $a_1$           | .9026  | .1568  | .0000 | $c'$           | .6217  | .0701  | .0000 |
| Gender (W)               | $a_2$            | 1.3534 | 1.6347 | .4080 | $b_2$           | 3.9840 | 2.5268 | .1154 |
| Internet Use for Academic X Gender (XW) | $a_3$           | $-1.319$ | $0.0858$ | $0.1246$ |               |         |         |         |
| Social Networking Sites’ Use (M) |               |       |       |       |               |         |         |         |
| Social Networking Sites’ Use X Gender (MW) |               |       |       |       | $b_3$           | $-2.659$ | $0.1183$ | $0.0250$ |

Model $R^2 = .4009$                      Model $R^2 = .3670$  
$F(3,608) = 135.6442$                    $F(4,607) = 87.9922$

Index of Moderated Mediation

| Index                  | SE  | 95%CI Lower Limit | 95%CI Upper Limit |
|------------------------|-----|-------------------|-------------------|
| $.2504                 | $.1016 | $-1.4509$          | $-0.0528$          |

Table A3. (Compare with Figure 3): Unstandardised ordinary least squares regression model coefficients of moderated mediation of students’ social development by school type

| Outcome                  | Model 1                          | Model 2                          |
|--------------------------|----------------------------------|----------------------------------|
| Social Networking Sites’ Usage (M) | Students’ Social Development (Y) |
| Predictor                | Coefficient | SE | P    | Coefficient | SE | P    |
| Intercept (Constant)     | $\beta_1$       | 2.7196 | 1.9540 | .1645 | $\beta_1$       | 45.1015 | 1.3183 | .0000 |
| Internet Use for Academic Activities (X) | $a_1$           | .9097  | .1098  | .0000 | $c'$           | .2430  | .0834  | .0037 |
| School Type (W)          | $a_2$            | 3.7945 | 1.4444 | .0088 |               |         |         |         |
| Internet Use for Academic X School Type (XW) | $a_3$           | $-1.771$ | $0.0837$ | $0.0347$ |               |         |         |         |
| Social Networking Sites’ Use (M) |               |       |       |       | $b_1$           | $0.3926$ | $0.0758$ | $0.0000$ |

Model $R^2 = .3919$                      Model $R^2 = .1300$  
$F(3,584) = 125.4551$                    $F(2,585) = 43.7072$

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| Index                  | SE  | 95%CI Lower Limit | 95%CI Upper Limit |
|------------------------|-----|-------------------|-------------------|
| $.0695                 | $.0316 | $-0.1451$          | $-0.0172$          |
**Table A4. (Compare with Figure 4): Unstandardised ordinary least squares regression model coefficients of moderated mediation of students’ moral development by school type**

| Outcome | Model 1 | | | Model 2 | | |
|---|---|---|---|---|---|---|
| | Social Networking Sites’ Usage (M) | Students’ Moral Development (Y) | | | |
| Predictor | Coefficient | SE | P | Coefficient | SE | P |
| Intercept (Constant) | i₁ | 2.3314 | 1.9193 | .2249 | i₁ | 21.5060 | 1.1044 | .0000 |
| Internet Use for Academic Purpose (X) | a₁ | .9322 | .1075 | .0000 | c' | .6433 | .0702 | .0000 |
| School Type (W) | a₂ | 3.988 | 1.4224 | .0052 | | | | |
| Internet Use for Academic Purpose X School Type (XW) | a₃ | -.1876 | .0822 | .0228 | | | | |
| Social Networking Sites’ Use (M) | - | - | - | bᵢ | .4244 | .0637 | .0000 |
| Model | R² = .4007 | | | Model | R² = .3555 | | |
| F(3,608) = 135.5297 | | | | F(2,609) = 167.9409 | | |
| Index of Moderated Mediation | | | | | | |
| Index | -.0796 | .0344 | | 95%CI Lower Limit | -.1557 | | 95%CI Upper Limit | -.0215 | |