ORIGINAL RESEARCH

Academic Cyberslacking: Why Do Students Engage in Non-Academic Internet Access During Lectures?

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Introduction: University students, as members of the digital generation, often access the internet for non-academic purposes while attending lectures in the classroom. Internet access for non-academic purposes during lectures is known as academic cyberslacking. This study aims to test the effects of media multitasking, self-efficacy, self-regulation, social media engagement, and Attention, Relevance, Confidence, and Satisfaction (ARCS) motivation, on the engagement in academic cyberslacking by university students.

Methods: The participants were 1485 university students, who had previously engaged in academic cyberslacking during lectures. The research instruments in this study were an academic cyberslacking scale, a media multitasking self-efficacy scale, a self-regulation scale, a social media engagement scale, and an ARCS motivation scale. The research model and hypotheses are tested using structural equation model (SEM) by Lisrel. Confirmatory factor analysis (CFA) is also used to analyze all the instruments. The respondents' demographic data were analyzed using SPSS.

Results: The results showed that it is only media multitasking self-efficacy and social media engagement which have any significant effects regarding academic cyberslacking. Self-regulation and ARCS motivation do not have direct association with academic cyberslacking.

Conclusion: Students do academic cyberslacking during lectures. Media multitasking self-efficacy and social media engagement can predict students' academic cyberslacking. It is recommended that students direct their involvement in the digital environment to more constructive efforts during lectures.

Keywords: academic cyberslacking, media multitasking self-efficacy, self-regulation, ARCS motivation, social media engagement, university students

Introduction

The provision of internet technology on campuses aims to facilitate access to learning sources, such as book references, research journals, and other learning information, to improve the quality of learning outcomes for students.[1-3] This approach to the learning process, with its emphasis on student autonomy in accessing learning sources, is in line with student-centered learning, which focuses on students being the active parties in the learning process.[4-7] The availability of internet access in the classroom is to assist the learning process of the students, in this student-centered learning.[8]

The ease of gaining internet access on campus during the learning process eventually results in challenges for the learning and teaching process emerging.[8] One of these challenges is the involvement of students in accessing materials which are non-academic, and irrelevant to the course being undertaken in the classroom.[9-11] This non-academic access is often performed by students on internet sites such as those of social media, sites irrelevant to the courses in progress, sites devoted to online shopping, or offering digital games.[12-15] Research conducted by Barry et al[8] also mentioned that students in class tutorials often access social media sites, such as Facebook, which are quite irrelevant to the courses at hand.[16] Students are also found chatting, sending emails, and accessing irrelevant sites during classroom learning sessions.

The phenomenon of students conducting non-academic internet access during classroom sessions is referred to as cyberloafing or cyberslacking.[8,12,17,18] The terms cyberloafing and cyberslacking arose from situations related to the non-productive behaviors of employees at work, using company internet access during productive hours, for matters irrelevant to the job.[19–21] Later, the concept of cyberslacking was used in an educational setting, to refer to the behavior of accessing non-productive internet sites, the non-academic internet access pursued by students during classroom sessions.[8,10,12,22,23]

Cyberslacking, in the academic context of higher education, is defined as the use of the internet by students, during classroom sessions, for non-academic access which is irrelevant to the classes in progress.[8–10,12,23] The forms of cyberslacking behaviors engaged in by students include sending text messages to their friends, and accessing email, irrelevant sites, social media, blogs, digital games, and online shopping.[8–10,12,23–25]

Several studies on cyberslacking have used the theory of planned behavior (TPB) in explaining cyberslacking.[18,26,27] These studies highlighted factors which may cause cyberslacking, such as those of attitude, subjective norms, and perceived behavioral control. One of the studies on cyberslacking, related to the TPB, was conducted by Taneja et al,[18] mentioned the attitudes of students being supportive of *cyberslacking*, which may encourage students to perform cyberslacking in class. Another study on cyberslacking, conducted by Askew et al,[26] stated that perceived behavioral control was an important factor in cyberslacking: the perception of a person as to whether or not it is difficult to perform cyberslacking. Once someone has a perception that it is easy to perform cyberslacking, without authority noticing, then that particular individual would be liable to perform cyberslacking in the process of completing a task.[26] Based on the TPB, the factors triggering cyberslacking are limited to three: attitude, subjective norms, and perceived behavioral control, which form the behavioral intention to perform cyberslacking behavior.[18,26]

Based on studies of cyberslacking, from the perspective of the TPB, the limitations of the TPB in explaining cyberslacking relate to the fact that the factors triggering cyberslacking are limited to only those three variables: attitude, subjective norms and perceived behavioral control. However, some studies on academic cyberslacking have hinted at other factors, besides those variables.[10,11,23,28–30] Those factors are self-regulation, extrinsic motivation, involvement in social media, confidence in media-multitasking, perceptions of the teaching methods of lecturers, perceptions of the abilities of lecturers in presenting materials attractively, the availability of internet access, and the field of learning.[10,11,23,28–30] Studies on cyberslacking have used those factors generally used in Social Cognition Theory (SCT), in explaining the bases of students performing cyberslacking in class.[9,29–31]

Social Cognition Theory (SCT) is often used by researchers to explore the factors influencing cyberslacking, as an alternative to the Theory of Planned Behavior, owing to the limitations of the TPB, which includes only the variables of attitude, subjective norms, and perceived behavioral control, in explaining academic cyberslacking behavior. The SCT has been used by some researchers to explain individual online behavior in an educational or social context.[32–34] The SCT, formulated by Bandura, is more flexible in explaining the interaction of the individual internal and external factors from the environment, which may influence online behavior.[32] In the SCT approach, the online activity conducted by an individual will be determined by his or her cognition, and his or her surroundings, and thus the variables influencing online behaviors are not limited to factors such as attitude, subjective norms and perceived behavioral control.[26,32,34]

Based on the literary review of studies using the SCT, regarding online behaviors, including cyberslacking, the variables of multitasking self-efficacy and self-regulation are factors with significantly influence online behaviors.[21,29,31,32,35–37] These are related to the individual factor (P) which is the cognition of a person related to his or her confidence in accessing the internet (media multitasking, self-efficacy) and the ability to engage in self-regulation, when accessing the internet.

In relation to the SCT, the influence of external surroundings is required to be considered by the lecturer, for an understanding of academic cyberslacking.[38,39] Academic cyberslacking performed by students is inseparable from the abilities of the lecturer, as the facilitator of the course. Lecturers with insufficient capability to deliver materials attractively may trigger cyberslacking behavior by students.[38,39] Students have highlighted that unattractive delivery may cause boredom, which students try to reduce by performing cyberslacking.[38,39] The role of lecturers in occasioning cyberslacking is in line with the ARCS thinking on extrinsic learning motivation, formulated by John Keller, which states that a teacher must meet the requirements related to the elements of Attention, Relevance, Confidence, and Satisfaction (ARCS) during teaching sessions.[40,41] Students having perception that the lecturer fulfills requirements related to the ARCS elements, in his or her teaching session, would reduce their ability to perform cyberslacking in class.

The role of social media is also to be considered in the context of non-academic internet access in classes. Undergraduate students are usually transiting the period of emergence into adulthood, characterized by the desire to associate with their fellow university students, resulting in social media becoming the main instrument for maintaining contact with their peers.[42] Social media engagement is a triggering factor for academic cyberslacking, since students want consistently to be in contact with their friends, despite being involved in university courses.[39] This is consistent with results from several cyberslacking studies, which state state that one cyberslacking behavior performed by students in class is accessing social media.[11,43,44] During class, students exchange messages or information through social media, with the contents often irrelevant to the class in progress.[44,45]

Several studies on the use of laptop computers and smartphones by university students have also found that the involvement of students in social media is influenced by the self-regulation of those particular students.[46,47] Thus, social media engagement by university students must be discussed in conjunction with self-regulation by these students. When a student can perform self-regulation properly, there is a high chance for that particular student to minimize his of her involvement in social media during class, which would in turn minimize the cases of academic cyberslacking in class.[48] Therefore, social media engagement may serve as the mediating variable, which may influence the relationship between self-regulation and academic cyberslacking. Referring to the above elaborations, this study had two research questions:

1. Do media multitasking, self-efficacy, social media engagement, ARCS motivation, and self-regulation have direct associations with the students' academic cyberslacking?
2. Is the relationship between self-regulation and academic cyberslacking by students mediated by social media engagement?

This research is necessary considering that the results of previous studies stated that the impact of non-academic internet access while in class could lead to a decrease in academic scores and difficulties in paying attention to lectures.[49,50] Thus, the impact of cyberslacking behavior is the absorption of learning material during lectures that is not optimal and causes students' low academic achievement. In addition, most research in education focuses more on the use of technology in the teaching and learning process and has not revealed much about the impact of using the internet for non-academic matters.

Literature Review
Academic Cyberslacking

Academic cyberslacking is defined as the use of the internet by the students for personal purposes, during a class.[29] Here, the term personal purposes refers more to things unrelated to the course. The term cyberslacking was used first in a workplace context but then applied in higher education.[19,29] Yilmaz et al,[8] in a study conducted at a Turkish university, defined cyberslacking, or cyberloafing, as the use of the internet for purposes outside the course, during course time. Gökçearslan et al,[12] in a study involving students in the State University of Ankara, Turkey, defined cyberslacking as the tendency of students to access the internet for things unrelated to their learning tasks. Akbulut et al,[12] who developed a tool to measure cyberslacking in an academic context, stated that cyberslacking is the use of internet technology for non-academic purposes, including sharing, shopping, real-time updating, accessing online content and game-playing. Below are the definitions of the academic dimensions of cyberslacking:[12,24,25]

1. Sharing

   Sharing is interaction with friends, via social media, in the form of chatting, uploading, accessing the uploaded materials of friends, and commenting on posts or uploads made by friends.

2. Shopping

   This activity is related to the activities of online purchase, accessing online shopping sites, and checking products sold online.

3. Real-time updating

   Real-time updating is an activity designed to update information or share the latest news on matters concerning a person, or his or her surroundings, via social media.

4. Accesing online content

Accessing online content is an activity undertaken to access and download online contents, such as videos and music.

5. Gaming

Gaming is an activity involving playing online games and visiting online game sites.

In this research, academic cyberslacking conducted by students during class was analyzed, based on the dimensions of academic cyberslacking formulated by Akbulut et al,[12] including those of sharing, shopping, real-time updating, accessing online content and gaming.

Social Cognition Theory (SCT) and Online Behavior

The Social Cognition Theory (SCT) was formulated by Albert Bandura to explain the interaction between internal factors, such as individual cognition, external factors from the environment, and the way behavior is influenced by these.[51,52] Internal factors comprise cognition and affection factors, which will influence each other to affect surrounding external factors. As individual cognition, as an internal factor, affects the environment (E), it will also affect individual cognition (P). When the cognition factor (P) affects behavior (B), in which an individual continuously produces certain conducts and manages to achieve desires, then that particular behavior will affect the cognition of that individual.[32,51,52]

In the context of online behavior (B), one of the influential individual cognition factors (P) is the confidence of a person when engaging in an online activity, which is summarized within the concept of internet and multimedia self-efficacy. A person who believes in his or her ability to access the internet and multimedia tends to engage in intensive online behavior.[32,36] Besides this, such continuous online behavior will contribute to strengthening the confidence of that person in undertaking access to the internet, in accordance with the concept of internet self-efficacy and multimedia self-efficacy. In another study, the concept of internet self-efficacy developed into media multitasking self-efficacy, owing to the growth in the variety of media accessible via the internet, as a result of advancements in technology.[30] The confidence of a person in accessing several media simultaneously, as in the concept of media multitasking self-efficacy, will influence the online behavior of that person.[30]

Another internal factor (P) of the SCT, in the study of online behavior, is self-regulatory ability.[32,34] A person who can perform self-regulation will behave in accordance with the appropriate standard of online behavior, in order to achieve a predetermined objective.[31,32,51] Someone who is capable of performing self-regulation will be able to control him or herself, so as not to indulge in impulsive online behaviors, preventing the achievement of desired objectives.[31,32] In the context of learning, in the higher education field, these objectives are those related to learning activities.[31,37] Thus, the online behaviors engaged in by a student should be those which are beneficial to the learning process.[31,37]

The Social Cognition Theory also mentions that the external surroundings factors (E) also affect the behaviors of a person.[32,51,52] These surroundings factors may take the form of people around the individual, who may influence the behavior of that particular individual.[51,52] In the context of the online behavior of students, a study by Alt and Boniel-Nissim,[53] found that when a student sees peers conducting non-academic internet access during class time, he or she will tend to do the same. In relation to the role of others as an environmental factor (E) in the online behavior of a student, it has also been noticed that the inability of a lecturer to deliver the materials in an interesting manner will tend to encourage students to engage in non-academic internet access in class.[38]

The role of the environment (E), noted above, refers to the real environmental context of an individual.[38,53] In the study of online behavior, the environment (E) is not limited to the real environment but also includes the digital environment.[32,54,55] This digital environment takes its form in the digital world, and its existence is in parallel to the real world.[32,54,55] The digital environment has a strong influence on online behavior, along with the growth of social media.[28,55,56] Regarding online behavior, in the SCT, several studies have shown that the digital environment (E) in social media has a stronger effect on the behavior of an individual, compared to that of the real world.[28,54,56] Amongst the digital generation, the digital environment (E) has at least the same strength of influence as that of the real world (E_1), while some digital environments have even stronger influences, in comparison to that of the real world.[22,28,54]

Media Multitasking Self-Efficacy and the Students' Academic Cyberslacking

Media multitasking self-efficacy is the confidence of that individual in his or her ability to access the internet on several gadgets or several media applications, simultaneously.[30,57] In the model of academic cyberslacking posited by Prasad et al,[29] it is stated that self-efficacy affects the academic cyberslacking performed by students during class time. This study developed the concept of self-efficacy into media multitasking self-efficacy, since later developments show that media multitasking self-efficacy is a more accurate term in the context of online behavior[30,32,36] Based on the SCT, media multitasking self-efficacy is a part of the individual element (P) which affects online behavior.[32,36,58]

In the context of members of the digital generation, or millennials, students are considered to have high confidence in their ability to run several media or non-media activities simultaneously.[25,30,59] This seems to be related to their exposure to various forms of media and technology since early childhood, commonly experienced by members of the digital generation.[59–61] These experiences are quite intense, regarding the media multitasking which forms the strong confidence of students that they are capable of performing media multitasking.[9,30,36]

Students with high confidence on their ability to perform media multitasking have the potential to indulge in academic cyberslacking during class time.[24,25,30,57] Their confidence regarding their skills in media multitasking is observable from their behavior when being present in the class, but at the same time also accessing the internet, chatting with friends, opening social media, or reading news unrelated to the course in progress.[12,24,30,57] A study by Wu[30] found that students with high levels of media multitasking self-efficacy would consider themselves able to perform learning activities well, even though they also simultaneously open social media, such as Facebook, and chat with friends. The stronger the media multitasking efficacy they have, the higher the potential for those students to perform academic cyberslacking in class time.

H1. Media multitasking self-efficacy has direct association with the students' academic cyberslacking.

Self-Regulation and the Students' Social Media Engagement

Several studies have argued that social media engagement is affected by the self-regulation of an individual.[37,44,48] Students with high self-regulation will be able to control their access to social media.[37,44,48] Self-regulation itself is defined as the skills of an individual to direct him or herself to the objectives pursued.[62] Related to the context of social media, students who can perform self-regulation well will be capable of controlling any desire to access social media.[37,48,63] Self-regulation should prevent students engaging in improper access to social media, resulting in their control of the behavior of social media engagement.[25,48,63]

A study conducted by Khang et al,[63] with 603 subjects who were active users of social media, indicated that self-regulation played an important role in individual social engagement with social media. Individuals who were incapable of good self-regulation had difficulties in controlling their engagement with social media.[63] Another study of university students in the US found that social media offers a strong temptation for students when they are performing academic activities or study.[48] Lack of ability regarding self-regulation results in difficulty for a student to manage him or herself, regarding engaging properly with social media.[48] Another study on self-regulation and social media was conducted by Wu,[56] of students in Taiwan. Results showed that the research subjects eventually fell into one of a number of categories, based on their self-regulation abilities regarding engagement with social media. Those belonging to the group called "Motivated Strategy" would be able to perform self-regulation on social media and thus would be capable of focusing on the tasks at hand.[56] Conversely, those who were grouped as "Unaware" would have less awareness on their cognition feelings, and behavior, regarding the achievement of learning objectives, resulting in the inability of those students to control their engagement with social media.[56]

The role of self-regulation, as the variable controlling the engagement of students in social media, is also reflected in a study by Lu et al,[47] on fact that, in this era of digital technology, social media often becomes a disturbing factor, which makes it difficult for students to reach academic objectives. Students with low self-regulatory skills tend to have more difficulty in controlling their appropriate engagement with social media.[25,47] Students with good self-regulation skills tend to properly control their social media engagement. However, it is difficult for students with low self-regulation to control such engagement.

H2. Self regulation has direct association with the students' social media engagement.

Social Media Engagement and the Students' Academic Cyberslacking

Studies related to online behavior during class time place involvement with social media as a significant variable regarding the non-academic internet access conducted by students in class.[11,16,28,44,45] Social media engagement is defined as being active participation in social media and its effects on cognition, emotion and behavior. Social media engagement may take the form of sending messages, updating stata, checking the posts of other people on social media, making comments, or likes, on, and sharing the contents of, social media.[28,64]

Social media is a representation of the surrounding digital environment, which enables every individual to access that environment, despite not being physically present.[54,55] From the perspective of the SCT on online behavior, social media can be categorized as the external surroundings factor (E) of the digital environment, which may not always be present in the real life of an individual.[32,55,65] For university students, the existence of the digital environment on social media has a similar significance to that of the real environment, in which these students live daily.[48,56,66] This was found in the study conducted by Rosen et al,[67] especially regarding the use of social media by students, reported that the longest time period during which they did not check their gadgets and social media was 10 minutes. This indicated that the existence of social media as a digital environment plays a significant role in the life of students, which makes it hard for students to not check on social media for an extended period of time.[68]

The involvement of students with social media will affect the internet-accessing they perform during class time.[28] Owing to the importance of the digital environment for students, they will tend to access social media during class time.[11,44,69] A study conducted by Wei et al,[44] on students in the US, showed that they tended to send text messages to one another during class. This is in line with the study conducted by Yasar and Yurdugul,[11] on students in Turkey, which showed that students' cyberslacking activities in classroom is largely checking social media. A study conducted by Gupta and Irwin[69] also pointed that the urge to access social media, such as Facebook, could occur when students were in class. This social media access seems to be on matters unrelated to the class, which means it satisfies the criteria for academic cyberslacking.[69] The attractiveness of the digital environment offers exciting activities for students, such as those of entertainment and social support; these activities make it difficult for students to part from the digital environment on social media for any lengthy period of time.[39,56,70]

H3. Social media engagement has direct association with the students' academic cyberslacking.

Self-Regulation and the Students' Academic Cyberslacking

Self-regulation influences the academic cyberslacking of students in class.[25,29,44] A study by Prasad et al[29] mentioned that students with low self-regulation would tend to indulge in cyberslacking in class, while, on the other hand, students who were capable of performing self-regulation to achieve their goals would be capable of restraining themselves from that activity. A study by Wei et al,[44] of students in the US, showed that when participating in a class, students sent messages to one another about things unrelated to the class itself. Wei et al[44] argued that the reason for this action was the lack of self-regulation of students, their inability to prevent themselves from accessing the internet over matters unrelated to the class.

A study by Zhang,[31] of students in Singapore, showed that students engaged in non-academic internet access through their laptops, during classroom courses. This study by Zhang[31] showed that academic cyberslacking occurred in classrooms, especially those holding a large number of students. The variable which had significant influence over academic cyberslacking in that study was self-regulation. Engaging in academic cyberslacking when participating in a class is an indication of low levels of self-regulation, making it difficult for students to refrain from accessing matters outside the scope of the course, on their laptops.[31]

Students with good self-regulation were capable of controlling their minds, feelings and behavior, to achieve their objectives, including their having the capability to control the desire to access the internet for contents irrelevant to their learning goals.[31,46] When students are capable of controlling their desires to access the internet for contents unrelated to the class in progress, academic cyberslacking will not occur.[31,46] Self-regulation, being the ability to direct oneself in achieving objectives, is also related to the control of impulses which might hinder a person from achieving those same objectives.[62] Self-regulation is also related to the control of impulses to access the internet appropriately, based on the situation, which in turn will influence the tendency towards academic cyberslacking.[31,32,46]

This seems to be one reason why the self-regulation of students may influence the possibility of academic cyberslacking in class.

H4. Self-regulation has direct association with the students' academic cyberslacking.

ARCS Motivation and Academic Cyberslacking

The academic cyberslacking occurring in classroom courses is inseparably related to the lecturers who deliver those courses.[38] Students may experience boredom in class, owing to the inability of the lecturers to deliver the lesson attractively, encouraging students to access non-academic internet content, or conduct academic cyberslacking.[38,39] The role of the lecturers in delivering courses significantly influences the extrinsic motivation of students when participating in classes, especially their ARCS motivation.[40,71,72]

According to Keller,[40] ARCS motivation is the perception of students regarding the efforts of the lecturers delivering learning materials, which consists of four dimensions: Attention, Relevance, Confidence and Satisfaction, regarding the learning process. Based on the SCT, ARCS motivation is the individual element (P) occurring, owing to the role played by the environment (E), which is, in this case, the teaching methods of the lecturers in class.

Studies of the online behaviors of students in class have shown that the lecturer significantly influences the accessing of non-academic internet contents by students.[38,39] Studies by Varol and Yildirim[23] noted that the ARCS motivation which emerged, owing to the role of the lecturers in teaching, should be considered to be one of the variables in studying cyberslacking by students. This notion is based on the proposition that when students are unable to understand the materials delivered by the lecturers, they will choose to engage in academic cyberslacking, chatting via social media.[24,39] In this context, students may have low ARCS motivation, since the lecturers lack the capability to deliver the materials attractively (attention) and relevantly (relevance), which would encourage students to engage in academic cyberslacking by accessing social media.[39,40] A study by Alt[39] also showed that when students experience difficulty, or are unable to keep up with the lecturers, they will choose to engage in academic cyberslacking.

Another study, relevant to ARCS motivational contexts of online behavior by students in class, was conducted by Varol and Yildirim,[38] concluding that the reason students engage in academic cyberslacking is the unattractive teaching methods of the lecturers. These unattractive teaching methods are the reason dimension A (attention) in the ARCS motivation of students is low, and that this drives students to be more interested in accessing social media.[38,40] If the lecturer can deliver the materials more attractively, and in a manner more integrated with internet access, then students will be more focused on the learning materials delivered in the class, and this may minimize the possibility of academic cyberslacking.[46]

H5. ARCS Motivation has direct association with students' academic cyberslacking.

Self-Regulation, Academic Cyberslacking and Social Media Engagement

Studies of the online behavior of students in classroom courses have shown that self-regulation is an influential variable, related to the academic cyberslacking conducted by students in class.[29,31,44] Academic cyberslacking activity conducted by students in classroom courses is generally activity to access social media.[14,39,45,66,69] This indicates that students have high social media engagement.[39,45,66] This social media involvement is closely related to the level of self-regulation of students in controlling their access to social media.[44,48,63]

A series of prior studies indicated the relationship between self-regulation and social media engagement, and self-regulation and academic cyberslacking.[11,39,47,48] Some other studies of online behavior indicated that social media engagement is the mediating variable between the influence of self-regulation and the problematic online behavior indulged in by individuals.[44,73] Those studies emphasized that self-regulation was more influential regarding academic cyberslacking, with social media engagement as the mediating variable. This notion is based on the proviso that students had social media engagement, or a high rate of involvement in social media.[30,31,39]

Related to social media engagement being a mediating variable, the study by Wei et al,[44] of university students in the US, indicated that chatting with friends would mediate the influence from self-regulation and the learning process

conducted by the students, in the classroom. This study is in line with that by Rozgonjuk et al,[73] of students in Estonia, which highlighted that social media engagement is a mediating variable between the influence of self-regulation and problematic internet access conducted by students. In the context of this study, academic cyberslacking was categorized as problematic internet access, since it might result in loss of focus, by students, on the courses being undertaken.[12,31,38,74]

Based on the elaboration above, it may be concluded that self-regulation will influence the social media engagement of students.[5,47,48] Students having high self-regulation skills tended to be able to control their involvement in social media, enabling them to access social media appropriately, based on the situation. These students were capable of restraining themselves from conducting non-academic internet access in class, since they were able to control their social media engagement, thanks to the influence of high self-regulation skills. On the other hand, a person with low self-regulation skills would be incapable of controlling his or her social media engagement, which, in turn, would result in academic cyberslacking being indulged in, in classroom courses.

H6. Self-regulation has an indirect effect on academic cyberslacking through social media engagement.

The academic cyberslacking research model that explains the relationship among variables as well as all the hypotheses in this paper is shown in Figure 1.

Methods

Participants and Procedures

Participants in this research were undergraduate students in the Faculties of Business, Psychology, Communications Science, Teacher Training and Education Science, Engineering, Medicine and Nursing (N = 1485) of Widya Mandala Catholic University Surabaya. There were 556 male and 929 female students. Regarding age, the participants were aged between 17 and 25 years, with M = 19.48, and SD = 1.798.
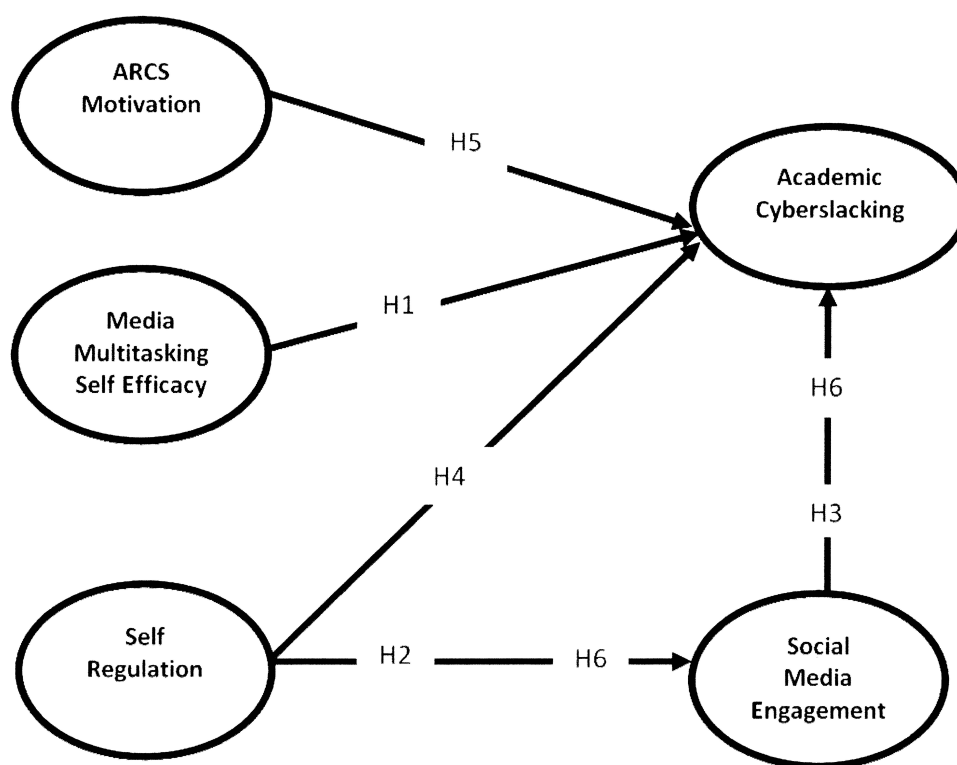

Figure 1 Academic cyberslacking research model.

Data collection was conducted by speaking to the participants after their classes ended and meeting the key personnel who could introduce the researchers to the student groups. After meeting the participants, the researchers, with the help of research assistants, explained the objectives of the research and confirmed the willingness of the participants to complete questionnaires. If the participants were willing, they completed the informed consent forms and were given the questionnaire to complete. This research was also approved by the Health Research Ethics Committee of the Faculty of Medicine, Universitas Katolik Widya Mandala Surabaya.

Instruments

Academic cyberslacking was measured by using the academic cyberslacking scale, adapted from the scale of cyberloafing in an educational setting, as formulated by Akbulut et al,[12] which had been translated and adapted into Indonesian.[24,25] The academic cyberslacking scale consisted of 5 dimensions: sharing, shopping, real-time updating, accessing online content and gaming/gambling. Participants were given a choice of responses from range of 1 (never) to 5 (to a great extent). The McDonald's Omega coefficient (ω) for this scale is 0.909. Confirmatory factor analysis (CFA) of cyberslacking academic scale showed fit indices were RMSEA = 0.079 (<0.08); SRMR = 0.082 (<0.1); NNFI = 0.95 (>0.90) and NFI = 0.94 (>0.80).

edia multitasking efficacy was measured using a media multitasking efficacy scale, which had been translated and adapted to Indonesian from the media multitasking self-efficacy scale developed by Wu.[30] This media multitasking self-efficacy scale uses 5 alternative responses, ranging as follows: 1 (not at all like me), 2 (not much like me), 3 (neutral), 4 (somewhat like me), and, 5 (very much like me). The McDonald's Omega coefficient (ω) for this scale is 0.792. Confirmatory factor analysis (CFA) of media multitasking self-efficacy scale results showed that RMSEA = 0.071 (<0.08); SRMR = 0.023 (<0.1); NNFI = 0.97 (>0.90); NFI = 0.99 (>0.80); CFI = 0.99 (≥0.97); GFI = 0.99 (≥0.90) and AGFI = 0.97 (≥0.90).

Self-regulation was measured by a self-regulation scale produced by Schwarzer, Diehl, and Schmitz.[75] This scale uses 4 alternative responses for each question, their values being: 1 (not all true), 2 (barely true), 3 (moderately true) and, 4 (completely true). This scale had been translated and adapted to Indonesian prior to being distributed to the participants. The McDonald's Omega coefficient (ω) for this scale is 0.708. Confirmatory factor analysis (CFA) of self-regulation scale were RMSEA = 0.055 (<0.08); SRMR = 0.032 (<0.1); NFI = 0.96 (>0.80); GFI = 0.99 (≥0.90) and AGFI = 0.97 (≥0.90).

ARCS motivation was measured using the ARCS motivation scale developed by John Keller.[40] This scale had been translated and adapted to Indonesian and has a McDonald's Omega coefficient (ω) of 0.934. The scale consisted of 5 alternative responses to each point: 1 (not true), 2 (somewhat true), 3 (moderately true), 4 (mostly true) and, 5 (very true). Fit indices of confirmatory factor analysis (CFA) in ARCS motivation scale showed fit indices were RMSEA = 0.070 (<0.08); SRMR = 0.048 (<0.1); NNFI = 0.97 (>0.90); NFI = 0.97 (>0.80) and CFI = 0.97 (≥0.97).

Social media engagement was measured using a social media engagement scale developed by Dorit Alt.[28] The scale had been translated and adapted to Indonesian and had 5 alternative responses for each point: 1 (never), to 5 (always). The McDonald's Omega coefficient (ω) of this social media engagement scale is 0.821. Fit indices of confirmatory factor analysis (CFA) of social media engagement scale showed that SRMR = 0.048 (<0.1); NNFI = 0.93 (>0.90); NFI = 0.96 (>0.80); GFI = 0.96 (≥0.90) and AGFI = 0.91 (≥0.90).

Data Analysis

The demographic data were analyzed using SPSS, and Microsoft Excel to count the number and percentage of the data. Then, a multivariate technique with a structural equation model (SEM), which combines factor analysis and multiple regression analysis, is used to test the research hypotheses and the cyberslacking model. Structural equation model is suitable to test the research model, which includes factor analysis and multiple regression analysis.[76] Each research instrument was also analyzed using Confirmatory Factor Analysis (CFA) before further analysis with the structural equation model (SEM).

Results

The demographic characteristics of the participants are presented in Table 1. Most of the respondents were female, 929 (62.6%), and the majority of the respondents' ages were between 17 and 19 years, 895 (60.26%). The participants were first-year until fourth-year university students, and the highest number of respondents were second-year students, 613 (41.3%). The participants were students from the Faculty of Engineering, the Faculty of Medicine, Faculty of Nursing,

Table 1 Sociodemographic Characteristics of the Participants (N=1485)

Demographics	Number	Percentage (%)
Sex		
Male	556	37.4
Female	929	62.6
Age		
17–19	895	60.26
20–22	545	36.7
23–25	45	3.03
Years of study		
First year	422	28.4
Second year	613	41.3
Third year	251	16.9
Fourth year	199	7.46
Faculty		
Faculty of engineering	260	17.51
Faculty of medicine	244	16.43
Faculty of nursing	143	9.62
Faculty of economics	264	17.77
Faculty of psychology	328	22.08
Faculty of communication	106	7.13
Faculty of education and teacher training	140	9.42

Faculty of Economics, Faculty of Psychology, Faculty of Communication, and Faculty of Education and Teacher Training. The number of students from each Faculty are presented in Table 1.

Results showed that most of the participants (32.05%) conducted academic cyberslacking for 15 to 30 minutes at a time. The durations of academic cyberslacking performed by the subjects are to be found in Table 2. This table shows that all participants conducted academic cyberslacking, but this varied in its duration. The most common reason given by students for performing academic cyberslacking was communicating with friends on things unrelated to the class (48.08%). Reasons for performing academic cyberslacking are to be found in Table 3.

Data analysis was conducted using a structural equation model (SEM), and the model fulfills the conditions of the fit indices indicator with the RMSEA = 0.078; SRMR = 0.07; NNFI = 0.91; NFI = 0.94; GFI = 0.94 and AGFI = 0.90. The first hypothesis tests (H1) proved to be significant, meaning that multitasking self-efficacy has direct association with students' academic cyberslacking ($\beta = 0.15$, $p < 0.01$).

The second hypothesis (H2) proved to be insignificant meaning that self-regulation did not have direct association with the social media engagement ($\beta = -0.01$, $p > 0.05$). For the third hypothesis (H3), social media engagement significantly associates with academic cyberslacking ($\beta = 0.69$, $p < 0.01$). For the fourth hypothesis (H4), it was proven

**Table 2** Time Duration of Academic Cyberslacking During Classroom Time (N= 1485)

Cyberslacking Duration	Number Reported	Percentage (%)
>60 minutes	266	17.91
30–60 minutes	277	18.65
15–30 minutes	476	32.05
<15 minutes	466	31.38
Total	1485	100

Table 3 Types of Student Internet Access for Academic Cyberslacking

Access Type	Number	Percentage (%)
Communicating with friends on matters unconnected with the lecture subject being undertaken	714	48.08
Social media access (reading postings, giving comments on postings, posting status updates)	554	37.31
Browsing for sites to do with other courses	514	34.61
Communicating with friends on assignments for other courses	478	32.18
Browsing sites unrelated to the course in progress	91	6.12
Playing games	25	1.68
Reading online comics	8	0.53
Reading newspapers	4	0.26

Note: Subjects may have provided more than 1 response.

that self-regulation does not significantly associate with academic cyberslacking ($\beta = -0.05$, $p > 0.05$). The fifth hypothesis (H5) was also proven to be insignificant: ARCS motivation did not have direct association with academic cyberslacking ($\beta = -0.03$, $p > 0.05$). The sixth hypothesis (H6) also proved to be insignificant: social media engagement did not mediate the relationship of self-regulation on the academic cyberslacking of students' ($\beta = -0.006$, $p > 0.05$). The results of the structural equation model (SEM) of academic cyberslacking model are shown in Figure 2.
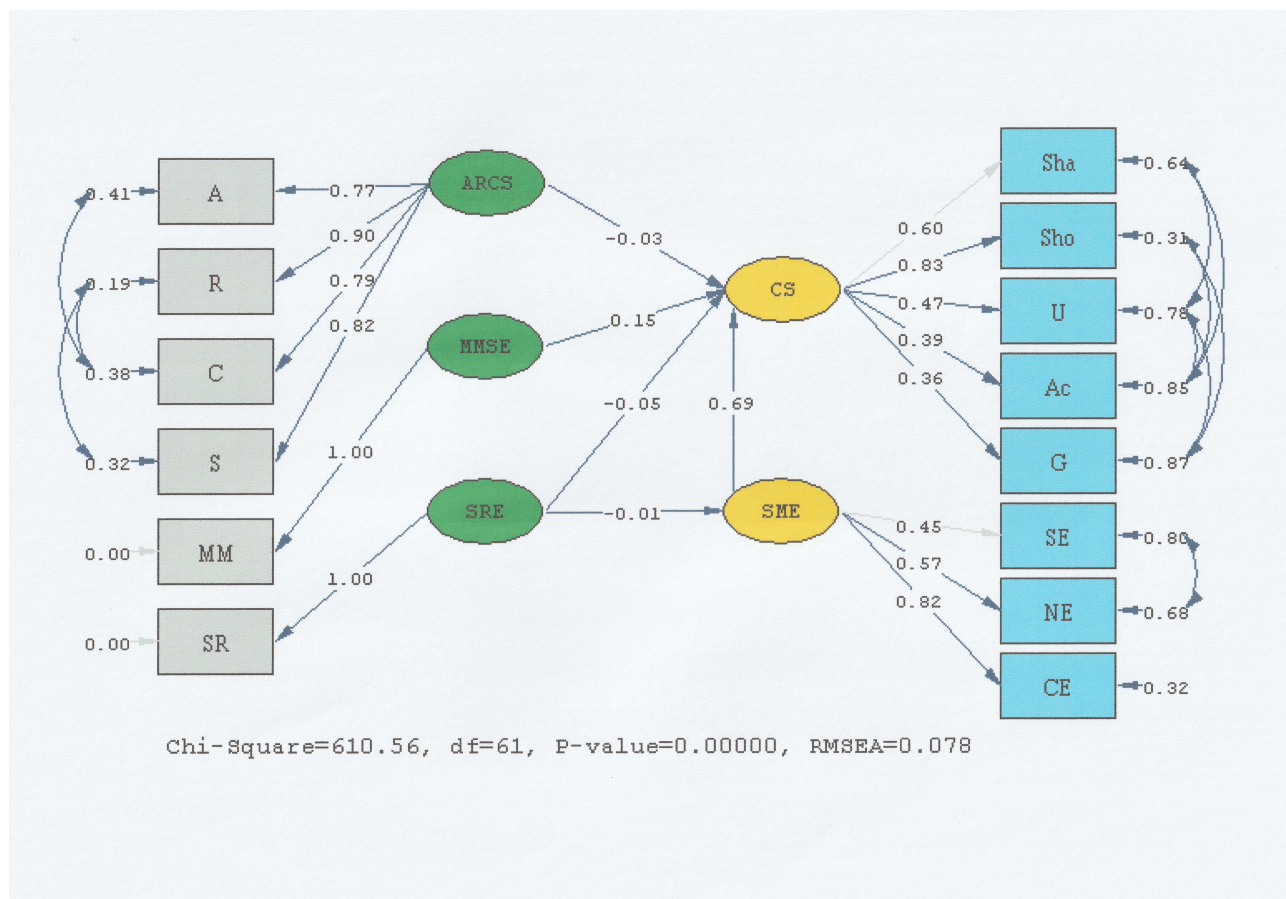
Figure 2 Academic cyberslacking model with standardized loading (N=1485).

Discussion

Do Media Multitasking Self-Efficacy, Social Media Engagement, ARCS Motivation and Self-Regulation Have Direct Association with the Students' Academic Cyberslacking?

The model for cyberslacking by students is based on Social Cognition Theory (SCT),[29,51,52] which claims that the environment (E) and the person (P) do have influence on behavior (B), in the context of academic cyberslacking by students. The significant individual aspect (P) in this study was represented by the variable of media multitasking self-efficacy, which is basically the confidence of a student on his or her ability to perform media multitasking. Strong confidence by students in their ability to perform media multitasking will make students confident in accessing the internet while listening to the lecturer in the class.[30,36] Confidence in media multitasking seemed to have been cultivated for quite a long time, since most students have most likely been exposed to technology since early childhood.[22] This would have encouraged students to become involved with two or more multitasking activities: non-media activity on the one hand, and other activities involving media and internet access on the other hand.[22]

Regarding the environmental aspect (E), the significant variable affecting academic cyberslacking was the involvement of an individual in social media (social media engagement), as posited in H3. Social media allows students to form a certain digital environment (digital world) which runs in parallel with the real world.[54,55,77] The influence of the digital environment is strong enough for students to remember their interactions or possessions in the digital world, while they are still in the real world. Based on this premise, when students are in the real world, in this case their class, they will also want to interact with their digital environment on social media.[54,55,69,78,79]

The dynamics of the environment (E) are materialized either in the real environment (E1 – the class attended by the students) or the digital environment on social media (E2 – social media). The engagement with social media is a part of the digital environment for students, holding the same importance for them as their involvement in the real world. This finding is in line with the study by Kononova and Chiang,[55] which stated that there is the concept of a simultaneous time-line, between the real world and the digital world (polychronicity), which potentially enables students to conduct two activities at the same time, in the real world and in the digital world. In this study, the two simultaneous activities conducted by students were following the lecturer in the classroom course and simultaneously performing academic *cyberslacking*. The millennial generation is one which grew and thrived in the digital era, making this generation tending always to be connected to the digital environment.[28,60,61,80] In this digital environment, students may find their need to communicate fulfilled, as well as their need to obtain social support from their peers, during difficult periods.[39,70] These things encourage students to stay in contact with people significant to them, through every activity they perform in the digital world.[39,70]

The attractiveness of social media, as a part of the digital environment, is one of the reasons why ARCS motivation is a variable, stemming from the teaching methods of the lecturers in the real-world class, and has no significant effect on the academic cyberslacking performed by students (H5). From the SCT, ARCS motivation stems from the role of the lecturers when delivering their materials in class, which falls into the category of the environmental element (E_1). Nevertheless, the digital environment (E_2) is considered to be more important to the students, compared with that of the real world, in this case the methods of lecturers in delivering lectures (E_1). As a result, lecturers with attractive methods of delivery (Attention), and ability to deliver their materials to the students in a relevant manner (Relevance), who are able to foster confidence in success (Confidence) and to encourage satisfaction in learning (Satisfaction) would have a lower effect on students, compared to their attachments to the digital world. The power of the digital world, in the form of social media, has more effect on students in the classroom than the learning situation.[15,81] Besides this, university students are considered to be adult learners, who desire autonomy in learning.[1,2,82] Students, as part of the digital generation, desire the freedom to deliver what they have learned to their environment, from the internet access they have.[83]

Based on the results of this study and the SCT, the individual aspect (P), the self-regulation variable, has no direct significant effect on academic cyberslacking (H2). This showed that students who are capable of self-regulation can realize their objectives, and restrain their impulses, but will also tend to perform academic cyberslacking similarly to their counterparts who have lower self-regulation skills. This is owing to the self-regulation skills of students in the digital era being different to the self-regulation encountered before the rapid development of the internet and social media.[9,57] Students with both strong and weak self-regulation skills still belong to the digital generation, which uses

internet access for different purposes.[57,84] Students who perform cyberslacking in class may do so in efforts to achieve their learning purposes. One of the ways this may occur is by them having discussions with friends, about the course being perceived as being difficult, and so it being seen as more urgent to perform academic cyberslacking in that particular class, as a form of assistance to their learning.[39] On the other hand, students with low self-regulation skills will perform *cyberslacking* owing to focussing on something more exciting, and avoiding the difficulties experienced in class. Based on this, students with high or low self-regulation skills may still be have the potential to perform academic cyberslacking in class, despite this being for different reasons.

Is the Relationship Between Self Regulation and the Academic Cyberslacking of Students' Mediated by Social Media Engagement?

The frequency of internet access by students tends to be constant when they are in class, but different objectives and different self-regulation skills result in the insignificance of social media engagement in mediating the effects of self-regulation and academic cyberslacking (H6). This is in line with a study by Alt,[39] which explained that there are students who engage in cyberslacking in class by accessing social media for entertainment purposes, while there are others who engage in cyberslacking by accessing social media to discuss how to complete assignments for other courses. A similar situation was also observed in a study conducted by Chang et al,[85] which showed that students with good academic motivation will use the internet to achieve their learning objectives; whilst those with low academic motivation will use the internet for entertainment and fun. Thus, the concept of self-regulation needs further development, to make it more suitable for the current digital generation, who have high involvement with social media. The characteristics of university students, as the members of the digital generation, who use the internet intensively in all academic activities, is one of the reasons for determining in this study the significance of variables on academic classroom cyberslacking. Besides that, the characteristics of university students as autonomous adult learners also affect the interconnections between variables. From this study, it can also be concluded that, based on the SCT related to the dynamics of academic cyberslacking activity among university students, the influential factors are personal conditions (P): media multitasking self-efficacy, and the digital environment factor; social media engagement (E). A strong belief in media multitasking ability and becoming highly involved in a digital environment, that is social media engagement, will potentially result in academic cyberslacking conduct (B) in class. This is in line with the findings of previous studies, which mentioned that using the approach of the SCT, the internal role (P) and the external role (E) will interact with each other in forming online behavior.[29,32,84,86] It is very interesting to observe that the real environment variable in the SCT has experienced a development in the current technological era, by being transformed into the unreal or digital environment.[28,32,54,55]

Based on the study results, the academic cyberslacking model in this study can explain academic cyberslacking in the classrooms with variables that align with the characteristics of digital native generation students. Additional variables such as media multitasking self-efficacy and social media engagement are more appropriate to explain the academic cyberslacking than the students' general self-efficacy and general self-regulation. This academic cyberslacking model is complete than the previous research model proposed by Prasad et al, which only used self-regulation and self-efficacy variables.[29]

The academic cyberslacking model in this study also strengthens the Social Cognition Theory (SCT) theory to explain students' online behavior when attending lectures in class. SCT, which involves the presence of individual elements (P), environment (E), and behavior (B), is more flexible when explaining online behavior than the Theory of Planned Behavior (TPB) which does not include elements of media multitasking self-efficacy and social media engagement in the theoretical model.

The new findings in this study also indicate that the ARCS motivation theory has dimensions that have unequally influenced student academic cyberslacking. The results showed that only dimensions A (attention) and R (relevance) affected student academic cyberslacking, while dimensions C (confidence) and S (satisfaction) did not affect student academic cyberslacking. Thus, the development of ARCS motivation theory needs to be considered, especially concerning online behavior in lecture learning situations.

Limitations

This study has several limitations that might influence the study results. First, this research was conducted at one university. Therefore, it has limitations to be generalized to students at other universities. Second, this research only involved students in several faculties, and not all fields of study include in this research. Further research can consider students from various study programs to gain more generalized results. Third, several variables are not controlled, for example, the lecturer's teaching method to see ARCS motivation in students. The variation of the lecturers' teaching method might influence students' perception of the lecturer's way of teaching and influence their answers in filling the academic cyberslacking self-report. In addition, the data collection method used self-reports based on respondents' perceptions of their academic cyberslacking behavior. Self-report might have the potential for social desirability response. Therefore, it would be better for future research to combine this self-report method with observations of student academic cyberslacking behavior in classroom settings.

Conclusion

The results of this academic cyberslacking model related to university students may serve as sources of information and guidelines to developing a suitable intervention, to minimize academic cyberslacking occurring in class. Besides that, this study also showed the needs for suitable understanding of the characteristics of university students from the digital generation, who intensively access the internet and have a multitasking learning pattern. Thus, the lecturer may be able to provide an appropriate reaction, instead of simply reprimanding students when they are found to be performing academic cyberslacking during class.

The variables which significantly affect academic cyberslacking are media multitasking, self-efficacy and social media engagement, and thus these need more attention for further intervention, in order to reduce academic cyberslacking in class. Training in online behavior management in relation to the above context may help students to be more constructive in managing their online behaviors. Thus, it is necessary that lecturers think of methods to accommodate both media multitasking self-efficacy and social media engagement, in order to be more constructively supportive to e-class learning, by using learning methods in classes which require internet access. Such teaching methods could also utilize social media, making social media engagement by students be more directed towards their class activities.

The results of this study could indicate recommendations for the online learning processes. In this online learning processes, by utilizing computer applications, students of the digital generation have the potential to engage in academic *cyberslacking*, owing to the limitations of surveillance by the lecturer. Thus, it is recommended that the significant variables found in this study, media multitasking, self-efficacy and social media engagement, be studied further in the online learning context, by using online face-to-face processes, involving computer applications, especially during the current situation brought on by the COVID pandemic, when most of the lectures in universities are being conducted online.

Ethics Approval

Ethical approval was approved by Faculty of Medicine, Universitas Katolik Widya Mandala Surabaya, Health Research Ethics Committee Approval Ref. 069/WM12/KEPK/DOSEN/T/2019 in accordance with CIOMS and WHO (2016) International Ethical Guidelines for Health-related Research involving Humans.

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Disclosure

The authors report no conflicts of interest in this work.

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