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MODELING CHEATING BEHAVIOR IN ONLINE EXAMS: A THEORY OF PLANNED BEHAVIOR (TPB) BASED APPROACH

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Abstract

Cheating in higher education has been widely studied, yet findings on its prevalence across traditional and online learning environments remain inconsistent. The COVID-19 pandemic triggered a sudden global shift to online education and examinations,

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amplifying concerns over academic integrity. Empirical evidence from this period suggests a surge in cheating behaviors; however, most studies lacked a robust theoretical framework to explain this trend. This paper develops and validates a theoretical model of online cheating, grounded in Ajzen's Theory of Planned Behavior (TPB) and enhanced by Bandura's concept of moral disengagement. To capture the unique dynamics of online exams, we refine the traditional TPB construct of Perceived Behavioral Control into two distinct dimensions: Regulations (REG), encompassing institutional policies and monitoring technologies, and Enabling Technology (TEC), referring to digital tools and platforms that facilitate misconduct. Using Structural Equation Modeling (SEM) with survey data from students at three Vietnamese universities in 2022, our findings confirm the model's explanatory power in identifying factors that contributed to the surge of online cheating during the pandemic-driven transition.

1 Introduction

Research on cheating behaviors in higher education has long been a major concern, attracting considerable attention from researchers ([4, 8, 9, 17, 19, 21, 22, 25, 26],...). However, findings regarding the prevalence and nature of cheating, particularly when comparing traditional (offline) and online learning environments, have shown significant inconsistencies. While some early studies suggested a higher incidence of cheating in online courses (e.g., [17, 19]), others indicated no significant difference ([16, 30]), or even a lower propensity for cheating in online settings ([10, 28]). This inconsistency primarily stems, in part, from differences in methodology, definitions of cheating, and the context of the studies. Furthermore, as observed by Bain ([4]), McCabe ([21]), Peytcheva-Forsyth et al. ([25]), and Eshet et al. ([10]), appropriate preparations and proper use of technology and policy measures could mitigate cheating in online classes as compared to traditional courses.

The sudden outbreak of the COVID-19 pandemic in late 2019 catalyzed an unprecedented global transition of universities from traditional on-site instruction to fully online education, including examinations ([9]). In this rapid shift, while a few institutions were already familiar with and prepared in terms of policies and technological controls for online exams, the majority were often forced to implement changes hastily and with insufficient preparation. This exacerbated existing concerns about academic integrity. Indeed, a consensus among studies conducted during this period has indicated a global increase in academic misconduct ([9, 14, 18, 26, 29],...).

However, the majority of research conducted during this critical period, while providing valuable empirical observations, often lacked a comprehensive theoretical framework or model to fully explain and predict the underlying causes of this surge in academic misconduct. Although classical theories like the Theory of Planned Behavior (TPB) by Ajzen ([2]) have generated many explanatory models on negative behaviors, in particular on academic cheating (e.g., [1, 20, 27]), they were not validated in a context similar to the sudden transition from traditional offline to online exams driven by the COVID-19 pandemic.

In this paper, building upon empirical analyses from the period, we develop a TPB-based theoretical model to analyze the causes of this observed global increase in cheating behavior. Our model integrates the concept of "moral disengagement" developed by Bandura ([5, 6]) into the TPB model, an approach adopted by several earlier researchers to analyze planned negative behaviors ([1, 20, 27]). To highlight the specific factors that differentiate the online exam environment from the traditional offline one, we propose separating the concept of Perceived Behavioral Control (PBC), which has been used in all previous adaptations of TPB, into two new concepts. The first is an inhibiting factor called regulations (REG) that may include the disciplinary policies from the institutions, and the monitoring technologies (or technological requirements) implemented. The second concept, called Enabling Technology

(TEC), includes the internet, social media, and other mobile technologies that allow students to cheat in online exams with relative ease and low risk of being caught.

The model is validated using the Structural Equation Model (SEM) method, with survey data of the students from three universities in Vietnam taken online in summer 2022. The results show the appropriateness of its use in measuring the effects of the suggested factors on online cheating and in providing insights into the factors driving the surge of online cheating when the universities moved hastily from offline to online education and testing. As a consequence, several policy implications will be proposed to mitigate the negative impacts of such transitions in the future.

2 Literature Review and Background

The Theory of Planned Behavior (TPB), first proposed by Ajzen in the seminal paper ([2]) has been widely cited in behavior research, and proven to be effective in empirically analyzing and predicting various types of planned behavior. According to Google Scholar, as of December 24, 2024, TPB has been cited by 129,437 different papers, showing the profound influence of this theory. In his original paper, Ajzen argues that human behavior is primarily determined by three interrelated factors: 1. Attitude toward the behavior, or "the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question"; 2. Subjective Norms, or "the perceived social pressure to perform or not to perform the behavior"; and 3. Perceived Behavioral Control that "refers to the perceived ease or difficulty of performing the behavior, and it is assumed to reflect past experience as well as anticipated impediments and obstacles." These three components collectively shape behavioral intentions, which, in turn, predict actual behavior. As depicted in Figure 1, Ajzen leaves open the possibility that perceived behavioral control has a direct influence on behavior in certain types of

behavior or specific situations.

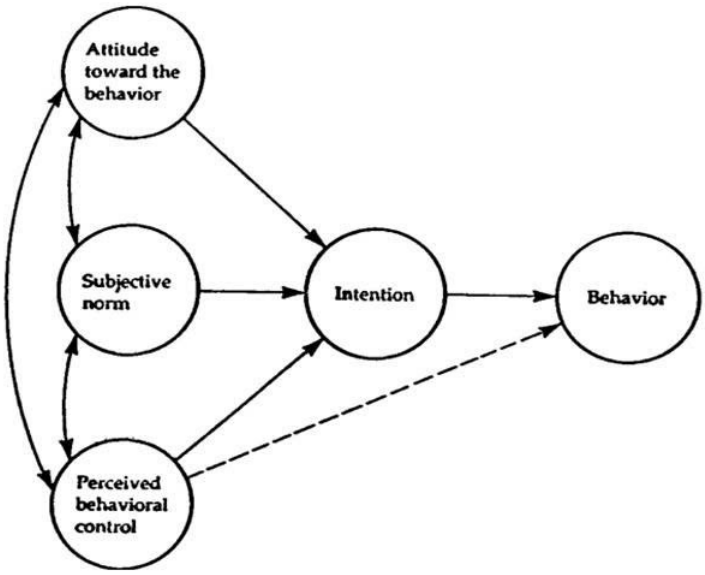

Figure 1. *Ajzen's Theory of Planned Behavior (TPB)*

While TPB remains a cornerstone of behavioral science, offering a robust theoretical framework for explaining and predicting human actions, the behaviors and contexts mentioned in its original model are general. Thus, when conducting analysis and prediction on specific types of behavior and in specific environments/circumstances, most researchers need more elaborate models ([1, 12, 20, 27]). One broad type of behavior that has been widely investigated using TPB includes unethical behaviors. Indeed, Ajzen was among the first to apply his TPB to such behavior, as mentioned in the original paper: "In a recent study of college students (Beck and Ajzen, in press), we evaluated this issue in the context of three unethical behaviors: cheating on a test or exam, shoplifting, and lying to get out of taking a test or turning in an assignment on time. It seems reasonable to suggest that moral issues may take on added salience with respect to behaviors of this kind and that a measure

of perceived moral obligation could add predictive power to the model." (p. 199, [2]).

For this purpose, many researchers adopted the concept of "moral disengagement" proposed by Bandura ([5, 6]) to explain why individuals often make unethical decisions without feeling guilty. According to Bandura, individuals exercise control over their own thoughts and behavior through a self-regulatory process based on personal standards of ethical behavior. These standards guide good behavior and prevent bad behavior because individuals use their personal standards to predict, monitor, and judge their own actions. Behaving in ways that go against these standards leads to self-sanctions. Thus, individuals often behave in ways that are consistent with their internal moral norms because they anticipate their own positive and negative evaluations of possible behavioral choices. However, this self-regulatory process only works when it is activated. Bandura argued that self-regulatory processes can be selectively activated and deactivated, and he proposed moral disengagement as a method of deactivating the self-regulatory process. Through moral disengagement, individuals are freed from the self-sanctions and accompanying guilt that occur when behavior violates internal standards, and they are therefore more likely to make more unethical decisions.

Connecting these ideas to TPB, Harding et al. ([12]), Mayhew et al. ([20]), Stone et al. ([27]) and other researchers suggested more elaborated models to analyze and predict students' cheating behaviors in exams, in which new factors are added that relate to ethical aspects such as: Moral Obligation ([20]), Justification ([27]), In addition, these authors also show the "inheritance" of the cheating behaviors, when pointing out that students who have cheated in high school are more likely to cheat in college ([12, 20]), and cheating behaviors in college have a relationship strongly linked to later workplace deception ([27]). The models and key findings of these results are illustrated in Figures 2 and 3.

These results have shown the suitability of integrating Bandura's use

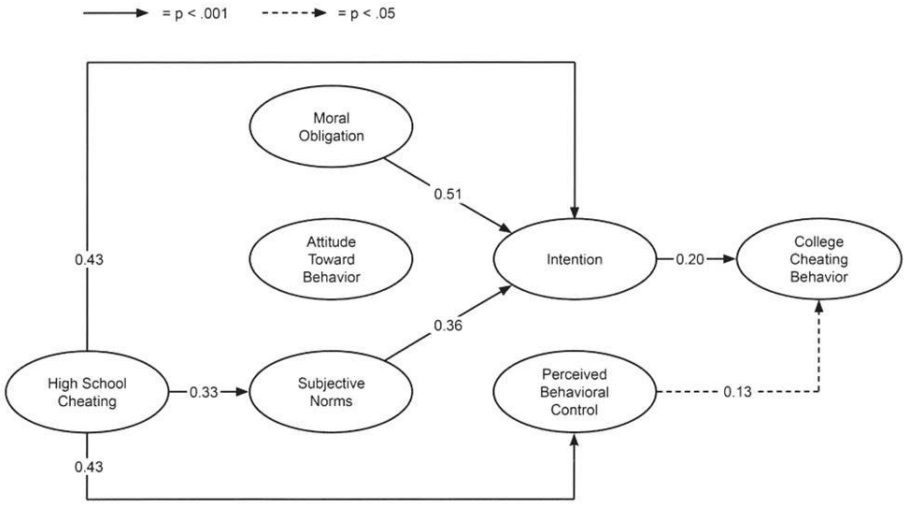

Figure 2. *The model of Mayhew et al. (2009)*

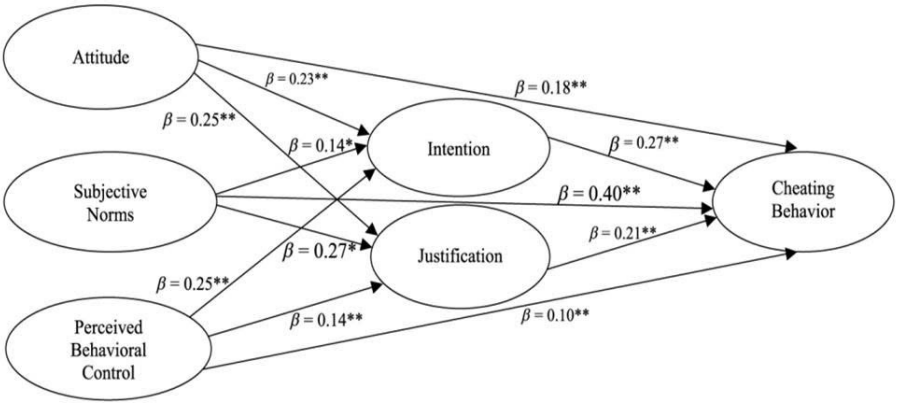

Figure 3. *The model and results of Stone et al. (2009)*

of moral disengagement (or justification) to the TPB-based models to analyze and predict students' cheating behaviors. It is interesting to note that, in these models, the impact of perceived behavioral control on cheating behavior in exams is quite weak or non-significant. These results appear to contradict the observations by several recent studies by Jenkins et al. ([14]), Lancaster and Cotarlan ([18]), Valizadeh ([29]), Stoesz et al. ([26]), Newton and Essex ([24]), etc. These authors investigated the phenomenon of students' cheating behavior in a new and different context, where universities, forced by the Covid-19 epidemic, have switched to online training and testing relatively hastily and without preparation. They all have shown a significant increase in cheating in online exams during the pandemic. In searching for an answer to the question why such an increase, we must assume that, compared with the context of earlier studies on off-line classroom exam cheating, the key change in the antecedent of cheating behavior in the generic TPB-based model lies in the perceived behavioral control. Indeed, moving from offline to online exams might raise new challenges for universities to regulate student cheating. At the same time, mobile technology and the internet create new opportunities for students to get non-permitted aid during exams. However, most of these studies for this period are based solely on descriptive analysis of empirical data without predictive behavioral models. Thus, to test our hypothesis on that new role of perceived behavioral control, we will have to build and validate a model to analyze and predict students' cheating behavior, based on elaborating the construct of perceived behavioral control to adapt to this new context.

3 Methodology

3.1 The model

As described above, our model is an adaptation of the model used by Stone et al. ([27]) to the context of sudden moves at universities to online exams, where the control of the students' behavior is complicated by both the lack of appropriate regulatory frameworks and the emergence of mobile technologies and the internet. The key hypothesis in this context is that the exam environment changes make students feel that they can cheat more easily, or it is harder to catch their cheating, thereby increasing the rate of cheating among students. Thus, to assess the impact of these factors on students' cheating behavior, we propose to separate the original PBC in Ajzen's TPB into two separate factors as follows:

- Regulations (REG): referring to students' perception of the system of regulations and exam rules, together with supporting technologies provided by the university and individual lecturers on monitoring and handling cheating behaviors, as well as the implementation of these regulations/regulations in practice; and
- Enabling Technology (TEC): referring to technologies available to students before and during the online exams that create opportunities or facilitate cheating behaviors. Such technologies might be internet with social media, mobile devices with various application software.

Thus, the proposed model includes the following components: Attitude (ATT), Subjective Norms (SUB), Regulation (REG), Technology (TEC), Intention (INT), Justification (JUS), and Behavior (BEH). Just like the model by Stone et al., the four components ATT, SUB, REG, and TEC influence INT and JUS, which in turn influence BEH. A key deviation from Stone et al.'s model in the relationships among the model

components is the possible impacts of the JUS on BEH. In fact, this Justification factor (or Moral Disengagement in Bandura's terms), could contribute both to strengthening students' cheating intentions (thus indirectly affecting behavior through intention), and to directly impact students' cheating behavior. For example, before the exam, a student not confident in his/her abilities may tell themselves that "the subject is too difficult to me" or "I need to pass the subject" which increases the intention to cheat. But during the exam, when this same student finds that the supervision is ineffective, he/she can find ways to discuss with friends or join closed groups to exchange assignments/documents. At this point, the student can justify "cheating is very easy to do and difficult to detect", or "everyone cheats anyway". In this situation such self-justifications may directly influence cheating behavior rather than through intention. The model investigated in this research is thus described in Figure 4.

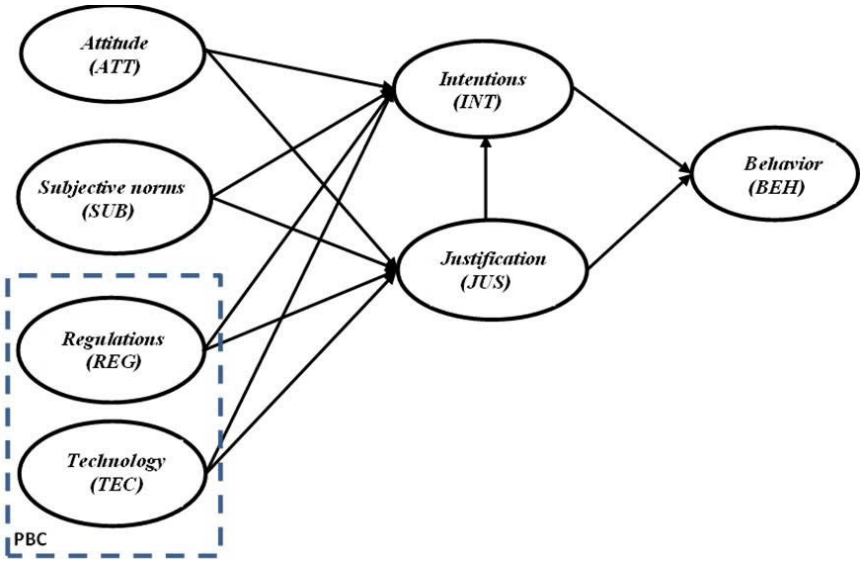

Figure 4. *The proposed model*

A short definition of the components in the model is given below,

with more detailed questionnaire items listed in Appendix 1.

- **Attitude (ATT)** assesses students' moral attitudes and beliefs toward cheating behaviors. The higher the score, the higher the student's tolerance for cheating.
- **Subjective norms (SUB)** assess students' awareness of standards formed through students' living and learning environments, such as expectations of teachers, families, and friends, for cheating behaviors. The higher the score, the greater the level of student awareness of these standards.
- **Regulations (REG)** assess students' perception of the regulations and rules, together with monitoring technologies and requirements provided by the university and individual lecturers, as well as the enforcements of these regulations/regulations in practice. The higher the score, the greater the level of student awareness of these standards.
- **Technology (TEC)** assesses the students' perceptions of level of technologies (internet, software and mobile devices) that facilitate their cheating behaviors, The higher the score, the more favorable conditions technologies create for students to cheat.
- **Intention (INT)** assesses students' intention to commit cheating behaviors in online tests. Higher scores indicate that students have stronger intentions to commit fraudulent acts.
- **Justifications (JUS)** evaluates the reasons students might use to justify their cheating behaviors, The higher the score, the more the student agrees with the reasons given.
- **Behavior (BEH)** evaluates the extent to which students admit having committed certain cheating practices. The higher the score,

the more frequent, or more likely, the student's violation of the mentioned behaviors is.

All the components in the model are operationalized with questionnaire items adopted from previous studies ([20, 27]). The items are listed in Appendix 1.

3.2 Data and analytical methods

Data collection was conducted online in the summer of 2022 using an anonymous Google survey form. Aside from demographic questions, all items used a 5-point Likert scale, ranging from 1 (Strongly disagree) to 5 (Strongly agree) for frequency of cheating behavior and from -2 (strongly disagree) to 2 (strongly agree) for remaining items. A total of 319 students from three universities in Vietnam participated in our survey. In the sample, the proportion of women was 64.9%, of the 2nd and 3rd year students was 85.7%, and of those majored in Economics, Finance and Banking was 85.9%. A descriptive summary of the sample is given below (Table 1).

Variables	Status	N	Percentage (%)
Gender	Male	112	35.1
	Female	207	64.9
Year - level at the university	Fist year	32	10.0
	Second year	208	65.2
	Third year	66	20.7
	Fourth year	13	4.1
Major	Economics, Finance, Banking	274	85.9
	Other	45	14.1
GPA	Mean: 3.07	Standard deviation: 0.91	

Table 1. *Demographic characteristics of the statistical sample*

As recommended by Hair et al. ([11]), the data are checked for internal reliability and consistency using Cronbach's alpha and standardized factor loadings. Also, according to the recommendations of

Anderson and Gerbing ([3]), before evaluating and measuring the model using structural equation modeling (SEM), the factor structure should be checked using confirmatory factor analysis (CFA). The model is then evaluated, and the main hypotheses are tested with Structural equation modeling analysis (SEM). All the analyses are done using the Statistical Package for Social Sciences (SPSS) and AMOS.

4 Findings and discussions

4.1 Model fit

First, the model was tested for internal consistence of the scales using Cronbach's alpha. All the constructs and items used for their operationalization have acceptable values of alpha and completely standardized factor loadings (see Appendix 1). Especially the two new constructs introduced in our model, Regulations (REG) and Technology (TEC), have quite high alpha (0.812 and 0.844, respectively).

To measure the fit of the proposed model, CFA analysis was conducted using AMOS 22, with the results summarized in Table 2. It could be observed from the table that among all the indices commonly used to assess the model fit (see for example, [11, 13]), only Tucker–Lewis's index (TLI) is very slightly below the threshold recommended (0.89 as compared with 0.90), while all others are satisfactory. These results indicate that our model is valid for its purpose of predicting student cheating behaviors.

χ^2	df	χ^2/df	RMSEA	PCLOSE	CFI	TLI
855.013	437	1.957	0.055	0.072	0.903	0.890
Cut-off values as recommended by Hair et al. (2013) and Hu & Bentler (1999)		≤ 2	≤ 0.06	≥ 0.05	≥ 0.9	≥ 0.9

Table 2. *Model fit indicators estimated in CFA analysis*

4.2 Findings from SEM analysis

The strength and statistical significance of the inter-relationships among the components of our proposed model are estimated with Structural Equations Modelling (SEM) analysis using AMOS, with the results presented in Figure 5 and Appendix 2.

First, it could be observed that all the relationships identified in the model, except for two (namely Subjective norms (SUB) and Regulations (REG) to Justification (JUS)) are statistically significant.

The most interesting finding from the model is probably the prominent role of TEC (enabling technology) in increasing the intention to cheat ($\beta = 0.40$, the highest among the factors influencing INT). While such a role has been observed in studies by King, Guyette, and Piotrowski ([17]), Lanier ([19]), Bain ([4])), or Mostrous and Kenber ([23]), all of whom believe that the online environment, with the support of technology, creates more favorable conditions for cheating behavior, thereby increasing the intention and behavior to cheat in general, this is likely the first time this has been estimated and found to be statistically significant in a TPB-based model. Furthermore, the strong impact of TEC on both INT and JUS (with $\beta = 0.40$ and $\beta = 0.33$ respectively) also shows a significant difference in the impact of PBC on cheating behavior in general when considered in different contexts. Specifically, according to the results of Mayhew et al. ([20]) and Stone et al. ([27]) (Figures 2 and 3), when monitoring and supervising classroom exams held under normal, offline conditions, usually with relatively good organizational and disciplinary procedures, the impact of PBC is not prominent compared to other factors ([27]), and is even faint ([20]). In our case, in the context of online exams held during the sudden outbreak of the Covid-19 pandemic, PBC through TEC generally has a much stronger impact.

Along with this, it is interesting to observe that regulations and rules (REG) have no statistically significant impact on moral justification (JUS), as well as a modest impact on cheating intention (INT)

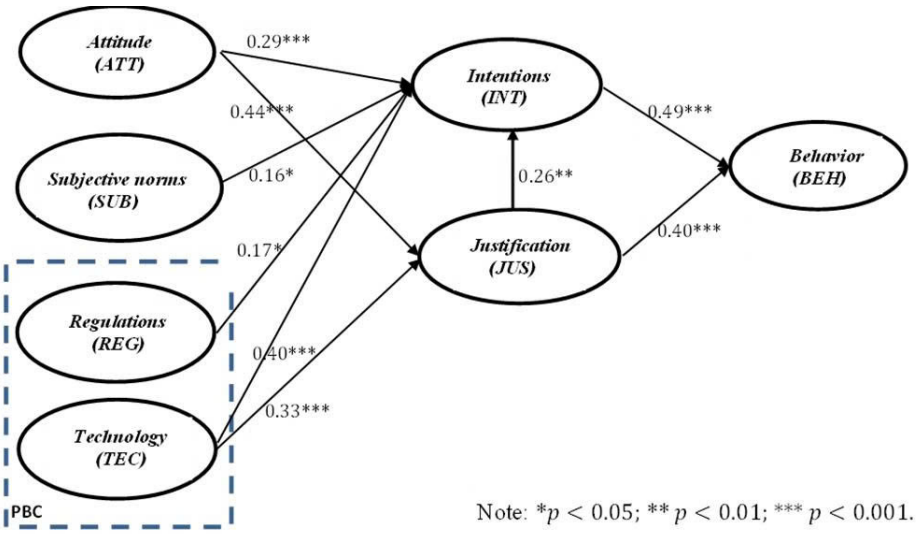

Figure 5. *SEM analysis results of the Model*

(with standard regression weight 0.17). Such observations suggest that general exam regulations and rules may not be effective in preventing cheating behavior, especially when students perceive them as unfeasible or not enforceable in practice. Similarly, SUB has no significant impact on JUS, as well as a modest impact on INT, suggesting that the learning environment of Vietnamese students does not seem to have a significant positive impact on reducing students' cheating behavior. Again, this may be a consequence of students not being adequately educated or not having a proper awareness of academic integrity issues.

The positive impact of REG on INT (with $\beta = 0.17$) appears to contradict typical observations. However, upon deeper analysis of the data, we found that while most students agree that the schools have clear and specific regulations regarding the handling of cheating behaviors (Med(REG1) = Med(REG2) = 1; Mod(REG1) = 2, Mod(REG2) = 1), they express certain skepticism about the effectiveness of the monitoring system from both the school and instructors, choosing mostly the score of 0 for questions related to the perceived effectiveness of the surveillance

system (Med(REG1) = Med(REG2) = 0; Mod(REG1) = Mod(REG2) = 0). This may indicate that anti-cheating regulations often fail to achieve the intended impact (in this case, potentially even backfire) if students believe they are ineffective in practice and that there are many ways to bypass the control mechanisms put in place by the school and instructors (Mod(TECH4) = Med(TECH4) = 1) (See Table 3).

	REG1	REG2	REG3	REG4	TECH1	TECH2	TECH3	TECH4
Mean	1.122	1	0.408	0.361	0.8934	0.3793	0.3323	0.4859
Median	1	1	0	0	1	0	0	1
Mode	2	1	0	0	1	0	0	1

Table 3. *Median and Mode of REG and TECH Construct Items*

In addition to the role of TEC as mentioned above, the model also shows the strong impact of the students' attitude (ATT) on both their moral disengagement (JUS) and cheating intention (INT), the precursors of their cheating actions (β = 0.44 and 0.29, respectively). This result supports the relationship between student attitudes and cheating behavior pointed out earlier by Carpenter et al. ([7]), that the more tolerant students are to unethical behavior, the more serious and frequent their cheating is.

An obvious policy implication of the results above indicates the need for the institutions to counteract the ease of cheating as enabled by the rapid advances of personal mobile technologies, combined with the internet and social media. However, countermeasures may not be effective if they rely solely on regulations or simple monitoring technologies that lack practical effectiveness. Instead, universities should make adequate investments in supportive technologies that help effectively organize and proctor online exams, such as: learning management systems (LMS) with integrated anti-cheating tools (e.g., Canvas, Moodle, Blackboard), and proctoring software (e.g., ProctorU, Honorlock, ExamSoft). Additionally, universities should place a greater focus on educating students

about academic integrity, raising awareness, and condemning cheating behaviors, along with feasible initiatives to promote honor codes ([8, 15, 21, 22]).

Moreover, the impacts of moral disengagement (JUS) as an intermediate factor on both intention to cheat (INT) and cheating behaviors (BEH) are found to be very strong. These results strengthen the views of Bandura ([6]) who argued that each person planning to perform an unethical behavior needs a reason to justify his or her actions. At the same time, the results also support our hypothesis on the direct and indirect effects of JUS on BEH which improves on previous studies. Indeed, Mayhew et al. ([20]) showed that the moral factor (Moral Obligation) only affects INT but does not directly affect BEH (see Figure 2), while Stone et al. ([27]) gave us slightly "opposite" result when the moral factor (Justification) only affects BEH but does not affect INT (see Figure 3). As a matter of fact, this could be explained by the differences in the ways the moral reasoning factors are understood and measured in the models. However, the findings show diversity in how such factors are, and should be, included in the TPB-based models. In any case, our findings confirm the need to include ethical factors in such models to analyze and predict unethical behaviors, as suggested originally by Ajzen.

In summary, based on the TPB and building on previous research ([1, 12, 20]; and especially [27]), we developed a statistically significant model to analyze the factors influencing the cheating behavior of Vietnamese students in the new context, where universities had to rush to transition from traditional training to online learning in response to the Covid-19 pandemic. Essentially, we highlighted the fundamental differences between the two contexts (before and during the Covid-19 pandemic) in terms of the increased impact of PBC on cheating behavior, while clarifying the impact of PBC through: 1. Specifying PBC into REG and TEC; 2. Identifying the role of PBC, through TEC, in increasing students' cheating behavior. This result once again expands the TPB

and provides new insights into the factors (including their weights and how to incorporate new factors into the TPB), affirming the effectiveness of TPB in analyzing students' fraudulent behavior and indicating that our proposals and hypotheses (considered in the new context) are relevant.

5 Conclusion

In this paper we have developed a theoretical, TPB-based model to analyze factors influencing student cheating behavior in online tests/exams, especially in the context of a hasty and not well-prepared transition from a traditional offline teaching and testing environment prompted by the COVID-19 pandemic. Using CFA and SEM analysis with empirical survey data from three Vietnamese universities, the model proved to be a valid tool to predict the cheating behavior and to measure the impacts of the identified factors. The results from the model have shown the importance of technology factors affecting student cheating behavior, contributing to explaining the increasing trend of cheating behaviors occurring globally during this period ([14, 18, 24, 26, 29], ...). This leads to policy implications requiring universities to have adequate investment in online exam monitoring and assessment systems to protect academic integrity. Although the Covid-19 pandemic is no longer a serious threat at the present stage, the online trend will certainly continue to be developed by universities in Vietnam, and therefore these findings will still be valuable in the new context.

The main limitation of this study is the use of self-reported data, since self-reporting of misconduct may make students feel reluctant and uncomfortable in answering survey questions even when anonymity is assured. Thus, although the results obtained are basically quite similar to other empirical studies, in general, caution should be used, and further verification studies are needed in the future.

Acknowledgements

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References

[1] **Ababneh, K. I., Ahmed, K., and Dedousis, E.**, *Predictors of cheating in online exams among business students during the Covid pandemic: Testing the theory of planned behavior*, The International Journal of Management Education **20(3)** (2022), 100713.

[2] **Ajzen, I.**, *The Theory of Planned Behavior*, Organizational Behavior and Human Decision Processes (1991).

[3] **Anderson, J. C., and Gerbing, D. W.**, *Structural equation modeling in practice: A review and recommended two-step approach*, Psychological bulletin **103(3)** (1988), 411.

[4] **Bain, L. Z.**, *How students use technology to cheat and what faculty can do about it*, Information Systems Education Journal **13(5)** (2015), 92.

[5] **Bandura, A.**, "Social foundations of thought and action", Englewood Cliffs, NJ, 1986(23-28), 2.

[6] **Bandura, A.**, *Moral disengagement in the perpetration of inhumanities*, Personality and social psychology review **3(3)** (1999), 193-209.

[7] **Carpenter, D. D., Harding, T. S., Finelli, C. J., Montgomery, S. M., and Passow, H. J.**, *Engineering students' perceptions of and attitudes towards cheating*, Journal of Engineering Education **95(3)** (2006), 181-194.

[8] **Cole, M. T., and Swartz, L. B.**, *Understanding academic integrity in the online learning environment: A survey of graduate*

and undergraduate business students, Proceedings of ASBBS **20(1)** (2013), 738-746.

[9] **Duong Quang, H., Ha Van, H., Do Ba, K., Nguyen, H. Q., Phan, V. M. T., Pham, Q. L.**, *Online Exam and Cheating: An Empirical Analysis of Lecturers' and Students' View*, Journal of Educators Online **22(2)** (2025), n2.

[10] **Eshet, Y., Peled, Y., Grinautski, K., and Barczyk, C.**, *What Predicts Cheating among Students? A Cross Cultural Comparison between Online and Face-to-Face Courses*, International Association for Development of the Information Society, (2019).

[11] **Hair, J. F., Black, W. C., Babin, B. J., and Anderson, R. E.** , "Multivariate data analysis", Pearson new international edition PDF eBook, Pearson Higher Ed.

[12] **Harding, T. S., Mayhew, M. J., Finelli, C. J., and Carpenter, D. D.**, *The theory of planned behavior as a model of academic dishonesty in engineering and humanities undergraduates*, Ethics and Behavior **17(3)** (2007), 255-279.

[13] **Hu, L., and Bentler, P. M.** , *Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives*, Structural Equation Modeling: A Multidisciplinary Journal **6(1)** (1999), 1–55.

[14] **Jenkins, B. D., Golding, J. M., Le Grand, A. M., Levi, M. M., and Pals, A. M.**, *When opportunity knocks: College students' cheating amid the COVID-19 pandemic*, Teaching of Psychology, 00986283211059067, (2022).

[15] **Jones, L. R.**, "Academic integrity and academic dishonesty: A handbook about cheating and plagiarism", Melbourne, FL: Florida Institute of Technology, (2011).

[16] **Grijalva, T. C., Kerkvliet, J., and Nowell, C.**, *Academic honesty and online courses. College Student Journal*, College Student Journal **40(1)** (2006).

[17] **King, C. G., Guyette Jr, R. W., and Piotrowski, C.**, *Online exams and cheating: An empirical analysis of business students' views*, Journal of Educators Online **6(1)**, n1, (2009).

[18] **Lancaster, T., and Cotarlan, C.**, *Contract cheating by STEM students through a file sharing website: a Covid-19 pandemic perspective*, International Journal for Educational Integrity **17** (2021), 1-16.

[19] **Lanier, M. M.**, *Academic integrity and distance learning*, Journal of Criminal Justice Education **17(2)** (2006), 244–261. http://dx.doi.org/10.1080/10511250600866166.

[20] **Mayhew, M. J., Hubbard, S. M., Finelli, C. J., Harding, T. S., and Carpenter, D. D.**, *Using structural equation modeling to validate the theory of planned behavior as a model for predicting student cheating*, Review of Higher Education **32(4)** (2009), 441–468. https://doi.org/10.1353/rhe.0.0080

[21] **McCabe, D.**, "Cheating and honor: Lessons from a long-term research project", Second Handbook of Academic Integrity, (2016), 599-610.

[22] **Moten Jr, J., Fitterer, A., Brazier, E., Leonard, J., and Brown, A.**, *Examining online college cyber cheating methods and prevention measures*, Electronic Journal of E-learning **11(2)** (2013), 139-146.

[23] **Mostrous, A., and Kenber, B.**, *Universities face student cheating crisis*, In The Times (2016).

[24] **Newton, P. M., and Essex, K.**, *How common is cheating in online exams and did it increase during the COVID-19 pandemic? A systematic review*, Journal of Academic Ethics **(22)** (2023), 323–343. https://doi.org/10.1007/s10805-023-09485-5

[25] **Peytcheva-Forsyth, R., Aleksieva, L., and Yovkova, B.**, *The impact of technology on cheating and plagiarism in the assessment - The teachers' and students' perspectives*, AIP Conference Proceedings, 2048 (December, 2018). https://doi.org/10.1063/1.5082055

[26] **Stoesz, B. M., Quesnel, M., and De Jaeger, A. E.**, *Student perceptions of academic misconduct amongst their peers during the rapid transition to remote instruction*, International Journal for Educational Integrity **19(1)**, 14, (2023).

[27] **Stone, T. H., Jawahar, I. M., and Kisamore, J. L.**, *Using the theory of planned behavior and cheating justifications to predict academic misconduct*, Career Development International **14(3)** (2009), 221–241. https://doi.org/10.1108/13620430910966415

[28] **Stuber-McEwen, D., Wiseley, P., and Hoggatt, S.**, *Point, click, and cheat: Frequency and type of academic dishonesty in the virtual classroom*, Online Journal of Distance Learning Administration **12(3)** (2009), 1-10.

[29] **Valizadeh, M.**, *Cheating in online learning programs: Learners' perceptions and solutions*, Turkish Online Journal of Distance Education **23(1)** (2022), 195-209.

[30] **Watson, G. R., and Sottile, J.**, *Cheating in the digital age: Do students cheat more in online courses?*, Online Journal of Distance Learning Administration **13(1)** (2010). https://eric.ed.gov/?id=EJ877536.

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Appendix

Appendix 1. Scale content and completely standardized factor loadings

Components	Completely standardized factor loadings	Cronbach's alpha
Attitude:		
✓ I think that searching for/using unauthorized learning resources is not too serious;	.618	.843
✓ I think that asking others to do tests/exams for me is not too serious;	.820	
✓ I think that creating or participating in groups/forums to exchange assignments or documents against regulations is not too serious;	.779	
✓ I think that helping friends by doing assignments for them or allowing them to copy my assignments is not too serious;	.751	
✓ I think that copying verbatim, or copying ideas, or using data and images from others without citing the source, according to regulations, is not too serious;	.803	
✓ When doing assignments in groups, I think that taking advantage of other members' efforts when I have not contributed anything is not too serious.	.687	
Subjective norms:		
✓ People I respect (like my family and teachers) expect me to be honest and not cheat on exams @;	.832	.690
✓ In my school, academic integrity is a value that everyone respects @;	.834	
✓ With group work, everyone condemns the act of taking advantage of other members' efforts when they have not contributed any effort @.	.601	
Regulations:		
✓ The university has clear and consistent regulations on prohibited behaviors when students take online tests/exams;	.671	.812
✓ The university has clear regulations on disciplinary actions if students violate online test regulations;	.665	
✓ The university's technical monitoring system can detect unauthorized behaviors of students in online tests/exams;	.851	
✓ The university's technical monitoring system can provide effective and undeniable evidence of unauthorized behaviors in online tests/exams.	.864	
Technology *(internet, mobile devices, software and social networks, etc.):*		
During online tests/exams,		
✓ Technology allows easy exchange and access to many sources of supporting information;	.698	.844
✓ Technology allows exchange and access to supporting information that is difficult to detect;		

✓ It is very difficult for teachers to detect or promptly handle cheating behaviors of students;	.840	
✓ Students have many ways to overcome the supervision of technical systems and teachers.	.829	
	.855	
Intention:		
Before online tests/exams,		
✓ I usually prepare additional equipment (phone or laptop,...);	.724	.711
✓ I create or join private chat groups;	.832	
✓ I often seek support from student forums;	.612	
✓ I think I can violate the test/exam regulations if there is a favorable opportunity or if it is really necessary.	.759	
Justification:		
You cheat because		
✓ Know that many people also cheat;	.777	.832
✓ Want to help friends;	.814	
✓ Pressure to achieve high scores or pass subjects;	.825	
✓ Being enticed by friends;	.646	
✓ The test is too difficult.	.797	
Behavior:		
During online tests/exams, have you ever		
✓ Searched for/used unauthorized learning resources;	.619	.763
✓ Asked others to take the test/exam for you;	.660	
✓ Take the test/exam for others;	.690	
✓ Created or participated in groups/forums to discuss assignments or documents against regulations;	.735	
✓ Copied verbatim, or copied ideas, or used data and images from others without citing the source as required;	.708	
✓ Relied on the efforts of other members when doing group assignments without wanting to contribute your own efforts.	.693	

Note: @ Reverse scored

Appendix 2. Standardized Regression Weights and p-values of the Model

			Estimate (*Standardized Regression Weights*)	**Estimate** (*Regression Weights*)	**S.E.**	**C.R.**	**P**
JUS	<---	ATT	.444	.358	.058	6.182	***
JUS	<---	SUB	-.007	-.006	.071	-.088	.930
JUS	<---	REG	.062	.052	.060	.855	.392
JUS	<---	TEC	.330	.275	.055	5.005	***
INT	<---	ATT	.286	.252	.066	3.840	***
INT	<---	SUB	.164	.168	.077	2.173	.030
INT	<---	REG	.174	.160	.066	2.417	.016
INT	<---	TEC	.402	.366	.066	5.542	***
INT	<---	JUS	.261	.286	.089	3.201	.001
BEH	<---	INT	.486	.376	.076	4.925	***
BEH	<---	JUS	.400	.338	.077	4.392	***

(*** $p < 0.001$)