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Factors That Affect the Learning of Students in an Online Learning Modality

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Joseph M. Armenton
Student, Mandaue City College, Mandaue City, Cebu, Philippines
https://orcid.org/0009-0003-0346-9541

Larry B. Berdin
Student, Mandaue City College, Mandaue City, Cebu, Philippines
https://orcid.org/0009-0002-2480-1075

Micha Hinie M. Gekin
Student, Mandaue City College, Mandaue City, Cebu, Philippines
https://orcid.org/0009-0001-1805-319x

Mhariel S. Boybanting
Student, Mandaue City College, Mandaue City, Cebu, Philippines
https://orcid.org/0009-0007-3253-2086

Regine Mae J. Ortiz
Student, Mandaue City College, Mandaue City, Cebu, Philippines
https://orcid.org/0009-0001-6597-0994

Shela Mae T. Tejano
Student, Mandaue City College, Mandaue City, Cebu, Philippines
https://orcid.org/0009-0000-8476-9615

Richelle A. Tero
Student, Mandaue City College, Mandaue City, Cebu, Philippines
https://orcid.org/0009-0002-0322-335X

Abstract:

The COVID-19 pandemic forced educational institutions to transition from traditional classrooms to online learning. This change affected various aspects of education, including time management, assignments, grades, and course instruction. The impact of online learning environments on students' perceptions remains unknown, especially in the context of academic and nonacademic aspects. The research aimed to assess the factors affecting students in an online learning modality as the basis for an online learning enhancement program. The descriptive correlational method was employed using adaptive survey questionnaires from The Online Course Motivation Survey (2013), Transition to Flexible Learning Modality Survey (2020), and Questionnaire of Effects from Online Classes (2020). The study involved 237 respondents majoring in Education with specializations in English, Filipino, general content, and mathematics. Data were statistically analyzed using percentage, frequency count, weighted mean, and Pearson r. The findings revealed that connectivity and time management were the most common challenges faced by students in online learning. Concerning the environment, noisy surroundings and lack of privacy in study areas had a slight impact on students. There was no significant relationship found between students' academic performance and the three factors - psychological, environmental, and technological. Based on the findings and conclusions, the proposed online learning enhancement program was highly recommended for implementation.

Keywords: Modality, Online Class , Pearson, Traditional Classroom, Transition to Flexible Learning Modality Survey

Introduction:

Online learning, a method of teaching without physical interaction, gained popularity in the Philippines after the Commission on Higher Education released Memorandum No. 4 Series of 2020. The decision to adopt this flexible learning model was based on data-driven and participatory decision-making processes. Mandaue City College adopted this new teaching method but faced challenges such as a lack of electronic equipment, shaky internet connections, and a lack of engagement. Some students reported lower grades and poor performance during online classes.

Studies by Corrales, Atoche, and Rojas (2021) found that poor scheduling and a lack of privacy contributed to students' discontent with the virtual study environment. Teachers and students were concerned about the sudden change in the school environment due to limited access to electronic devices and shaky internet connections. Gilabert-Cerdá, et.al. (2021) found a decrease in motivation, loneliness, and technical connection problems among students.

Researchers worked to identify variables impacting students' learning, including psychological, environmental, and technological factors. These included interest and motivation, readiness for online learning, coping mechanisms, self-efficacy in time management, study space privacy, comfort with online classes, ownership and access to devices, effectiveness with technology use, level of familiarity, and capability with educational technology. The findings served as a foundation for future development strategies aimed at improving the implementation of online courses in light of these considerations.

Literature Review:

Research was done by Diaz (2020) and Cottrell (2021) to examine how student grades and dropout rates were affected by in-person and virtual learning. In Diaz's study, academic performance in face-to-face and emergency remote learning for students enrolled in the University of Guyana's SPA1003 course was compared, with greater grades obtained in the latter scenario.

In comparison to pre-pandemic values, Bode et al. (2022) observed that students' self-efficacy increased less during the pandemic. According to Bruna et al. (2022), undergraduate instructors frequently used LMS as a storehouse for information, which reduced the advantages of collective intelligence. According to Al Sulaimi et al. (2022), there was a considerable impact on students' performance across various learning modalities, including online, blended, and face-to-face. Cao (2022) discovered that supportive homework policies and a favorable learning atmosphere improved student performance. According to Rajapakse (2022), students favored remote learning to in-person instruction, but this resulted in a decline in their capacity for reasoned problem-solving. The aforementioned research underscores the significance of fostering cooperative and consensus-building processes among students in diverse learning settings.

According to research by Corrales, Atoche, and Rojas (2021), poor schedule management was a major factor in college students' discontent with their confinement during the COVID-19 pandemic. According to Gutiérrez et al. (2021), temperature, noise, and lighting all had a big influence on students' academic performance. Mamolo (2022) discovered that the primary causes of online learning dissatisfaction were housework, a sluggish internet connection, and a lack of drive. Researchers Capagalan et al. (2021) discovered a strong correlation between first-year college students' academic motivation and self-efficacy in public state colleges in the Philippines. According to Sankar et al. (2020), administrative support, course design, content, learner characteristics, and teacher characteristics all had an impact on the quality of e-learning in higher education. According to Carlos et al. (2021), academic achievement increased during the virtual semester.

Research Method:

Correlational research was employed, focusing on objective measurements and statistical analysis. The study was conducted at Mandaue City College, a university that offers undergraduate courses in information technology, business administration, and teacher education. The respondents were students enrolled in Bachelor of Secondary Education programs and Bachelor of Elementary Education. Researchers used stratified random sampling to select students from each year level for a survey-style questionnaire to explore the relationship between psychological, environmental, and technological aspects of academic achievement. Likert scale questionnaires with four and six types were used, and grades from the final semester were utilized to assess success. Participants were surveyed via Facebook, Messenger, and MS Teams.

Findings and Discussion:

This chapter contained the presentation, analysis, and interpretation of data. The information presented was based on the responses gathered through Microsoft forms.

Table 1.

Factors that Affect the Learning of Students

Factors	Number of responses	Percentage
Interest and attention	75	32 %
Readiness	28	12 %
Lack of participation	54	23 %
Lack of concentration	96	41 %
Lack of motivation	63	27 %
Poor comprehension and retention	24	10 %
Lack of support	36	15 %
Time management	101	43 %
Coping strategies	26	11 %
Uncomfortable lightning level	23	10 %
No privacy in study area	95	40 %
Noisy surroundings	118	50 %
No proper ventilation	36	15 %
Lack of access to devices	96	41 %
Efficacy to technology use	43	18 %
Familiarity and capability to technological tools	32	14 %
Connectivity	118	50 %

Table 1, The students encountered the greatest number of factors in connectivity and noisy surroundings. Shield and Dockrell's study revealed consistent findings that noise negatively affected academic performance, especially for children with special educational needs. The previous study supported the idea that noisy surroundings significantly impacted student learning. The factor with the lowest occurrence was uncomfortable lighting levels, suggesting that despite the noise, the lighting remained suitable for learning.

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Table 2.

Interest and attention. The Online Course Motivation Survey (2013)

Statement	Mean	Interpretation
1. The way the course content is presented online keeps me interested.	2.89	Agree
2. I feel that I am encouraged to ask questions.	2.84	Agree
3. The variety of activities and interactions in this online course holds my attention.	2.94	Agree
Average	2.89	Agree

Legend:3.25-4.00 (Strongly Agree), 2.50-3.24 (Agree), 1.75-2.49 (Disagree), 1.00-1.74 (Strongly Disagree)

Based on the table 2, students agreed with their interest in online discussions. With an average of 2.89, they agreed that the content and activities in online discussions kept them interested and encouraged them to ask questions. Contrary to a study by Irawan et al. (2020) that found students getting bored with online learning after two weeks, this study showed continued interest even after the second semester in college. The feeling of being encouraged to ask questions had the lowest frequency, indicating potential isolation and loneliness in online discussions. Motivating and engaging students during discussions was deemed necessary for effective learning.

Table 3.

Readiness to Online Learning. Transition to Flexible Learning Modality Survey (2020)

Statement	Mean	Interpretation
1. Skill level in using technology for online learning	3.37	Average
2. Level of readiness for online learning	3.44	Average
3.The likelihood that you will enroll in online courses	3.45	Average
4.The extent of recommending online learning to others	3.11	Average
Average	3.34	Average

Legend: 5.16-6.00 (Very High), 4.33-5.15 (High) 3.50-4.32 (Above Average), 2.67-3.49 (Average), 1.84-2.66 (Low), 1-1.83 (Very Low)

Table 3 presented the students' level of readiness in online learning modality. Their skill level in using technology and readiness for online learning was rated as average. Most students had an average likelihood of enrolling in online courses and recommending this learning modality to others. A study by Aguilar and Torres (2021) examined the impact of shifting from blended to fully online learning during the COVID-19 pandemic, highlighting challenges such as technological difficulties, individual readiness, instructional struggles, and domestic barriers. Given that individual readiness was identified as a challenge in the previous study, the sudden transition from traditional to online learning resulted in an average readiness level for Mandaue City College education students.

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Table 4.

Coping Strategies for Online Learning. Transition to Flexible Learning Modality Survey (2020

Statement	Mean	Interpretation
1. Accept the situation and learn to live with it.	2.97	Almost Always
2. Ask academic support from teachers and professionals	2.23	Sometimes
3. Stay positive and optimistic despite loads of work.	3.2	Almost Always
4. Take a break from academic works by watching TV, listening to music, or playing.	2.97	Almost Always
5.Try to practice online or flexible learning platforms on my own	2.86	Almost Always
Average	2.85	Almost always

Legend:3.25-4.00 (Always), 2.50-3.24 (Almost Always), 1.75-2.49(Sometimes), 1.00-1.74 (Never)

Table 4 displayed the results on students' coping strategies for online learning modality. It showed that students sometimes sought support from teachers or professionals. According to Huang and Zhang (2021), support from parents, teachers, classmates, or friends could motivate students to perform better in their studies. Most of the time, students learned to accept the situation, stayed optimistic despite heavy workloads, took breaks by listening to music or playing, and tried to practice using online learning platforms on their own. On average, the results showed that students tried their best to cope with challenges most of the time.

Table 5.

Online Learning Self-Efficacy as to Time Management. Transition to Flexible Learning Modality Survey (2020)

Statement	Mean	Interpretation
1. Manage time effectively	3.25	Good
2. Complete all assignments on time	3.81	Very Good
3. Meet deadlines with minimal reminders	3.48	Good
4. Focus on schoolwork when faced with distractions.	3.07	Good
5. Develop and follow a plan for completing all required work on time	3.57	Very Good
Average	3.44	Good

Legend: 5.15-6.00 (Expert), 4.32-5.14 (Proficient), 3.49-4.31 (Very Good), 2.66-3.48 (Good), 1.83-2.65 (Fair), 1.00-1.82 (Poor)

In Table 5, the researcher measured the students' level of self-efficacy regarding time management. The results indicated that they were good at managing their time. They rated themselves as very good at developing a plan to complete all required work and assignments on time. Contrary to a study by Corrales et al. (2021) that highlighted student dissatisfaction with virtual studies due to inadequate schedule management, this survey showed that students at Mandaue City College were proficient in time management. Additionally, students responded well by meeting deadlines with minimal reminders and staying focused on schoolwork when faced with distractions.

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Table 6.

Environmental Factors. Questionnaire of Effects from Online Classes (2020)

Statement	Mean	Interpretation
1. The level of lighting in my study area allows me to see clearly what is around, as well as to concentrate when taking online classes.	3.04	Sometimes
2. I have privacy in my study area when taking classes online.	2.53	Sometimes
3. The noise level (coming from devices, people's talks, external sources) in my study area allows me to concentrate, take the class, and clearly hear my teacher and classmates	2.56	Sometimes
4. The ventilation in my study area is appropriate for taking the classes online.	2.81	Sometimes
Average	2.73	Sometimes

Legend:3.25-4.00 (Always), 2.50-3.24 (Sometimes), 1.75-2.49 (Hardly ever), 1.00-1.74 (Never)

Table 6 displayed the results on the effects of environmental factors on student learning. It showed that at times, the lighting, noise, and ventilation levels made them uncomfortable during learning. Additionally, they did not always have privacy in their study area. Chukwuemeka studied the impact of environmental factors on student academic performance in Port Harcourt, Rivers State. The study found that performance was affected by the environment, and improper maintenance of fixtures resulted in below-average student performance. Another study by Lewinski indicated that noise, temperature, and seat arrangement were the most influential factors affecting the learning process. Therefore, the student's environment needed to be conducive to learning to prevent lower performance.

Table 7.

Ownership of ICTs. Questionnaire on Learner Use of Technology (2016)

Devices	Number of responses	Percentage
Smartphones	203	86 %
Tablet or iPad	5	2 %
Laptop	19	8 %
Desktop computer	7	3 %
Other	3	1 %

Based on Table 7, students mostly owned smartphones for online learning, with some also having laptops. This indicated that the majority attended online classes using phones, highlighting a lack of resources for effective learning experiences. Some students used desktop computers from their homes, offices, or cybercafes, challenging their resourcefulness and patience in learning with limited resources. Additionally, some students indicated not owning any of the devices listed in the questionnaire, suggesting further constraints on their access to technology for online learning.

Table 8.

Access to ICTs. Questionnaire on Learner Use of Technology (2016)

Where do you access internet	Number of responses	Percentage
Home	193	81 %
Office	6	2 %
Cyber café	9	4 %
Do not access	22	9 %
Other	7	3 %

Based on Table 8, the majority of pupils had access to an internet connection at home, indicating a lack of privacy in their study spaces and difficulties focusing during class discussions. Since most students owned cellphones and laptops, they did not need to study in separate locations but used mobile data and Wi-Fi for internet access. However, some students faced challenges due to erratic connectivity, hindering their participation in online discussions. Some students joined discussions from offices or cybercafés. Poor network connections were among the challenges students faced during the learning process, as noted by Erlina and Rafid (2021). Chaerunnisa, Santoso, and Sukmayanti (2021) highlighted the lack of access to technology among some students. This study corroborates previous research, emphasizing the challenges posed by technological limitations for students.

Table 9.

Online Learning Self-Efficacy as to Technology Use. Transition to Flexible Learning Modality Survey

Statement	Mean	Interpretation
1. Navigate online course materials efficiently.	2.99	Good
2. Find the course syllabus online.	3.02	Good
3. Communicate effectively with my instructor via e-mail (Gmail, yahoo mail, messenger)		
4. Submit assignments to an online drop box such as Google drive	2.91	Good
5. Navigate the online grade book.	2.73	Good
6. Search the Internet to find the answer to a course-related question	2.98	Good
7. Search the online course materials	3.12	Good
Average	2.95	Good

Legend: 5.15-6.00 (Expert), 4.32-5.14 (Proficient), 3.49-4.31 (Very Good), 2.66-3.48 (Good), 1.83-2.65 (Fair), 1.00-1.82 (Poor)

In table 9, the overall results in the students' self-efficacy in technology use were 2.95, indicating proficiency. However, this score fell below the 75% mark on the scale, categorizing it as a lower level of proficiency. Shirish, Chandra, and Srivastava (2021) noted that while some students adapted well to the new IT-enabled learning environment, others faced challenges in adjusting. The study also highlighted the positive relationship between IT mindfulness and productivity and creativity in learning, with these relationships influenced by students' perceptions of techno stress. Despite some students being able to search for content online, many struggled in doing so.

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Table 10.

Level of Familiarity and Capability to Educational technology Tool Transition to Flexible Learning Modality Survey (2020)

Statement	Mean	Interpretation
1. Office Productivity Tools (Microsoft Office, LibreOffice, etc.)	4.36	Familiar and Capable
2. Social Media (Facebook, Twitter, Instagram)	5.27	Very Familiar and Capable
3. Online Collaboration Tools (Google Docs, OneDrive, etc.)	4.78	Familiar and Capable
4. Virtual Classroom (Google Classroom, Edmodo, Schoology, etc.	4.41	Familiar and Capable
5. Messaging Tools (Gmail, yahoo mail, messenger, etc.)	5.36	Very Familiar and Capable
6. Video sharing sites (YouTube, Vimeo)	4.95	Familiar and Capable
7. Videoconferencing applications (Zoom, Google Meet, Microsoft Teams, etc.)	5.04	Familiar and Capable
8. Statistical Tools (SPSS, Stata, MS Access)	3.58	Fairly Familiar and Capable
9. Programming Tools (Windows Movie Maker, OBS)	3.22	Somewhat Familiar and Capable
10. Video and image editing tools (Adobe Photoshop, Canva)	4.34	Familiar and Capable
Average	4.53	Familiar and Capable

Legend: 5.15-6.00 (Very Familiar and Capable), 4.32-5.14 (Familiar and Capable), 3.49-4.31 (Fairly Familiar and Capable), 2.66-3.48 (Somewhat Familiar and Capable), 1.83-2.65 (Unfamiliar and Incapable), 1.00-1.82 (Very Unfamiliar and Incapable)

Table 10 depicted the familiarity and capability of students in using educational technology tools. Students showed high familiarity and capability in using office productivity tools, online collaboration tools, virtual classrooms, video-sharing sites, video conferencing applications, video and image tools, social media, and messaging tools. They were somewhat familiar and capable with programming tools and fairly familiar and capable with statistical tools. The overall result indicated that students were proficient in using educational technology tools. Previous research by Wan, Wang, and Haggerty (2008) highlighted the positive impact of prior ICT experience and virtual competence on e-learning outcomes. This study aligned with the notion that students' familiarity and capability with educational technology tools positively influenced their online learning experiences.

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Table 11.

Academic Performance of the respondents

Grade Range	Frequency	%	Verbal Description
94-90	27	11.39	Superior
89-85	198	83.55	Very good
84-80	12	5.06	Good
Total	237	100	
Average	**87**		Very good

***Legend**: 100-95 (Excellent), 94-90 (Superior), 89-85 (Very good), 84-80 (Good), 79-75 (Fair), 74-72 (Conditional), 71-64 (Failure) as stipulated on the MCC Student's Manual.*

Table 11 indicated that the majority of students, 83.55% of the sample, received very good grades in the 85-89 grade interval. Additionally, 11.39% (27 students) received superior grades in the 90-94 range, and 5.06% (12 students) received good grades in the 80-84 range. The mean score for the 237 students was 87, reflecting very good grades.

Table 12.

Test on the Significant Relationship Between the Psychological, Environmental and Technological Towards the Student's Academic Performance

Factors	Correlation Coefficient (r)	P-value	Findings
Psychological Factors	0.011	0.878	Not Significant
Environmental Factors	0.037	0.635	
Technological Factors	0.048	0.511	

Based on Table 12, no significant relationship was found between students' academic performance and psychological factors. The R-value was 0.011, and the p-value of 0.878 exceeded the set level of significance. Similarly, the p-value for environmental factors was 0.635, indicating no significant relationship. This led to the acceptance of the null hypothesis, stating no connection between environmental influences and student academic achievement. Additionally, no relationship was observed between students' academic performance and technological factors, despite the transition from face-to-face to online learning, as students were already familiar and capable of using educational tools.

Conclusion:

The study found that students' behavior did not change significantly from conventional to online training, as they preferred working and communicating online. This preference was explained by the Unified Theory of Acceptance and Use of Technology (UTAUT). IT mindfulness positively impacted productivity and creativity in learning, with students' techno-stress perceptions influencing these relationships. Prior experience with ICT and virtual competence positively influenced e-learning outcomes. However, students faced difficulties with online learning due to a lack of privacy, inadequate ventilation, and noisy settings.

Limitations and Further Research:

Based on the research findings, the researchers strongly recommended the GANOSA approach to students to improve their problem-solving skills. Additionally, this approach not only enhanced skills in Mathematics but also in various real-life situations. For teachers, the utilization of this approach helped in being more effective by providing step-by-step explanations for solving mathematical problems. Future researchers could use this study as a reference for research purposes or for developing programs beneficial to students, teachers, and educational institutions. The researchers highly suggested the use of the GANOSA approach, as outlined in the research action plan, for developing and enhancing students' mathematical problem-solving skills.

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CITY OF MANDAUE
MANDAUE CITY COLLEGE
Don Andres Soriano Ave., Centro, Mandaue City
Tel. No. 236-5520
E-Mail Add: mc.college@hotmail.com

CERTIFICATION FOR PLAGIARISM CHECK

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This certification is issued upon the request of the group as part of their course requirements.

Given this 24th day of April 2024.

JOSEPH ARNOLD C. BAUNSIT, LPT, M.Ed
Instructor I
Mandaue City College

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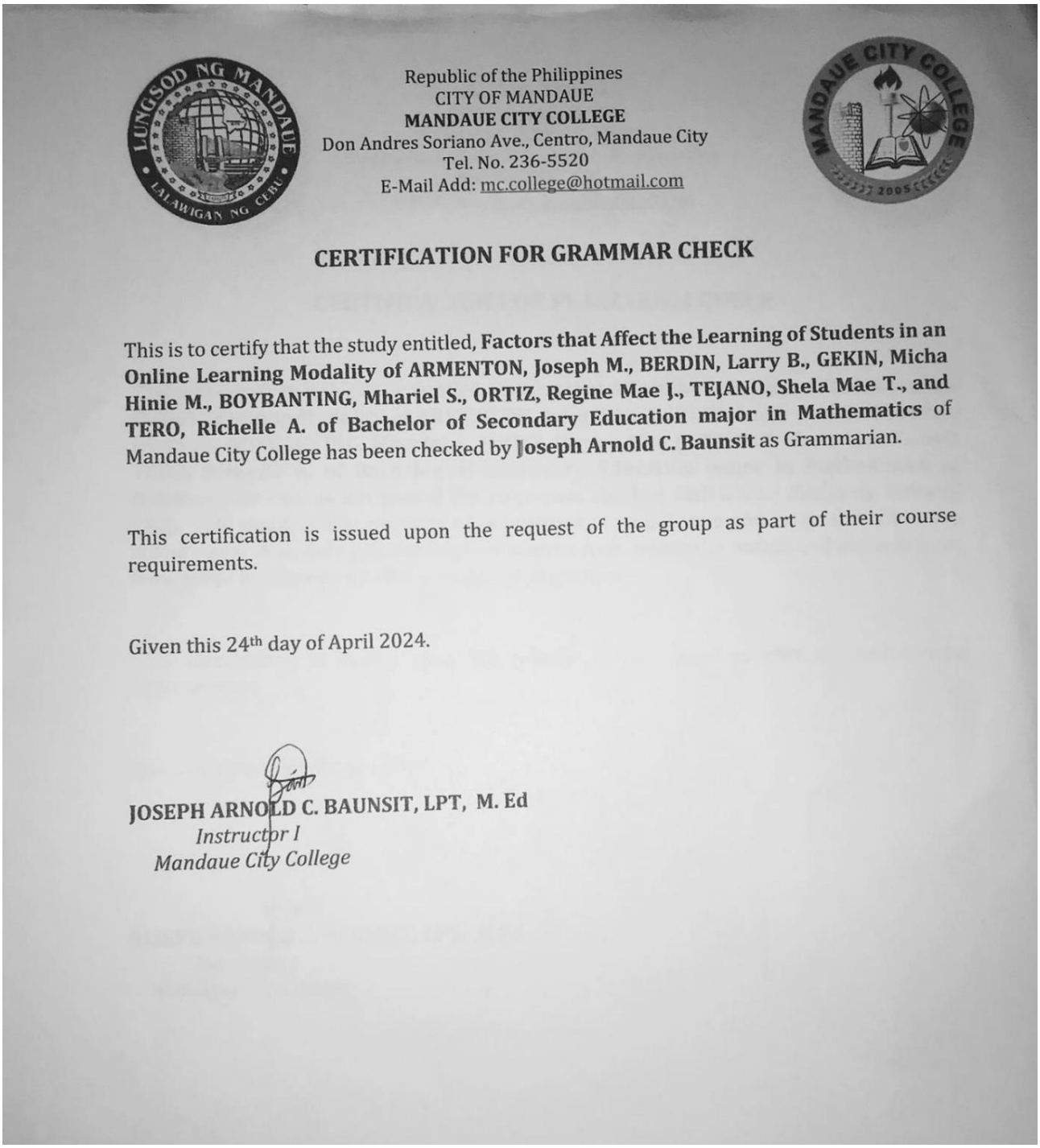

Republic of the Philippines
CITY OF MANDAUE
MANDAUE CITY COLLEGE
Don Andres Soriano Ave., Centro, Mandaue City
Tel. No. 236-5520
E-Mail Add: mc.college@hotmail.com

CERTIFICATION FOR GRAMMAR CHECK

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Given this 24th day of April 2024.

JOSEPH ARNOLD C. BAUNSIT, LPT, M. Ed
Instructor I
Mandaue City College