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RESEARCH ARTICLE

Letting go of Mathematics, Science, and ICT: The Psychology of Course Shifters from Mathematics, Science, and ICT to Non-Mathematics, Science, and ICT Programs

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ABSTRACT

This study examined the psychological factors influencing students to shift from Mathematics, Science, and Information and Communications Technology (MSI) programs to non-MSI disciplines in higher education. Using a qualitative exploratory design, forty participants who transitioned from MSI to non-MSI courses were interviewed to understand their motivations, struggles, and growth experiences. Findings revealed that many students initially enrolled in MSI programs due to family expectations, societal prestige, and peer influence. Over time, they encountered burnout from demanding workloads, role strain from conflicting responsibilities, and difficulty envisioning future careers, reflecting low levels of career decision-making self-efficacy (CDMSE). These factors created dissonance between external pressures and authentic interests, pushing students toward non-MSI fields. Yet, course shifting was not viewed as academic failure. Instead, students described the transition as a transformative process that allowed them to rediscover passions, redefine success, and rebuild confidence in their chosen paths. The study also identified interventions to sustain MSI engagement, including contextualized and collaborative instruction, bridge programs to strengthen foundations, and career guidance to enhance CDMSE. Overall, the findings highlight course shifting as both a challenge and an opportunity, underscoring the need for institutional strategies that balance academic rigor with

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psychological support.

Keywords: Mathematics, science; ICT; psychology; course shifting; peer pressure; burnout; role strain; career decision-making self-efficacy

1. Introduction

Transitioning from a Mathematics, Science, and Information and Communications Technology (MSI) program to a non-MSI discipline is a complex academic and psychological process. This shift is not simply a matter of changing courses; it often represents a fundamental reorientation of a student's identity, aspirations, and well-being. Students who initially enroll in MSI programs frequently do so under the influence of powerful external factors such as family expectations, peer influence, and societal perceptions that these fields are prestigious, intellectually superior, and economically rewarding. While these motivations encourage enrollment in MSI programs—including mathematics, physics, chemistry, biology, engineering, computer science, and ICT-related tracks—they often mask deeper issues of personal interest, readiness, and long-term compatibility.

Previous studies have consistently highlighted that academic self-efficacy—a student's belief in their ability to succeed in specific tasks—plays a vital role in persistence within challenging disciplines such as mathematics, science, and ICT[1]. Students with high self-efficacy are more resilient in the face of difficulties, while those with lower self-efficacy are vulnerable to discouragement, disengagement, and eventual course shifts. Course shifting, therefore, often coincides with a period of self-reassessment, during which students reflect on their goals, strengths, and personal identity in pursuit of fulfillment beyond academic performance[2-3].

One of the most salient social forces shaping MSI course selection is peer pressure. In many cases, students are influenced by peers, parents, teachers, and even community expectations to pursue MSI fields that are viewed as prestigious or financially secure. Although positive peer influence can stimulate engagement in mathematics, science, or ICT, negative dynamics—such as competition, unrealistic comparisons, or lack of peer support—may intensify anxiety and hinder academic performance[4]. When this external influence does not align with intrinsic interests, it can result in dissatisfaction, underachievement, and eventual reconsideration of academic choices[5].

Another critical factor is burnout, which is highly prevalent in MSI programs due to their rigorous workloads, technical requirements, and high-stakes assessments. Students who enter MSI fields without intrinsic motivation or interest often find themselves overwhelmed by the emotional, physical, and cognitive demands of these programs. Burnout manifests as exhaustion, disengagement, and reduced performance, and has been widely documented as a major contributor to course shifting[6-8]. For many, shifting to non-MSI disciplines represents not only an escape from academic pressures but also an opportunity to reclaim balance, rediscover passion, and restore mental health.

The psychological burden of role strain further complicates the MSI academic experience. Role strain occurs when expectations tied to the MSI student identity—such as excelling in problem-solving, laboratory experiments, or programming—conflict with students' abilities, values, or aspirations[9]. Students who find MSI requirements incompatible with their skills often experience frustration, low self-confidence, and emotional distress. For some, these tensions reflect a deeper conflict between external obligations and internal goals, pushing them toward programs where their abilities and aspirations align more naturally[10].

Central to these dynamics is career decision-making self-efficacy (CDMSE), which refers to students' confidence in their ability to make informed career and academic decisions. Within MSI programs, low

CDMSE is often tied to repeated failures, uncertainty about future careers, or a lack of perceived relevance between coursework and professional aspirations[11]. Conversely, transitioning to non-MSI fields often allows students to rebuild their CDMSE by selecting programs better aligned with their strengths, thereby restoring motivation and agency over their academic and career trajectories[12].

This study is anchored in Social Cognitive Career Theory (SCCT), developed by Lent, Brown, and Hackett[13], which explains how personal efficacy beliefs, outcome expectations, and contextual supports shape individuals' educational and career decisions. Within this framework, course shifting can be viewed as a self-regulatory process in which students re-evaluate their career decision-making self-efficacy (CDMSE) in response to internal and external influences. SCCT has been widely applied to studies of career development and academic persistence[14] but has rarely been used to understand course shifting in Mathematics, Science, and ICT (MSI) programs in the Philippine context. By employing SCCT as its guiding lens, this study explores how efficacy beliefs, perceived barriers, and social persuasion interact to shape students' decisions to disengage from MSI tracks and re-align with programs that better fit their interests and self-concepts.

This study investigates the psychological experiences of Filipino students who shifted from MSI to non-MSI programs. By understanding their struggles and decision-making processes, the research contributes to improving institutional support systems that promote resilience, adaptability, and academic fulfillment.

2. Literature

The phenomenon of course shifting from Mathematics, Science, and Information and Communications Technology (MSI) programs to non-MSI disciplines is shaped by a complex interplay of social, psychological, and academic factors. Research highlights that such decisions are rarely impulsive; rather, they reflect deep-seated struggles with external pressures, personal identity, mental health, and future career aspirations. Four critical constructs—peer pressure, burnout, role strain, and career decision-making self-efficacy (CDMSE)—consistently emerge as the most influential factors in this process.

2.1. Peer pressure and social expectations

Peer influence and societal expectations strongly shape the academic trajectories of students entering MSI fields. In many cases, students choose mathematics, science, or ICT-related programs because of the prestige associated with these disciplines and the belief that they lead to stable and lucrative careers[15]. Families and communities often encourage enrollment in MSI programs, equating them with academic excellence and intellectual superiority[16].

However, peer pressure can also generate negative consequences. Students who enroll in MSI without genuine passion may struggle with motivation and self-confidence. Social contexts such as friendships, classroom dynamics, and even comparisons with high-achieving peers can intensify anxiety and frustrationm[17]. While supportive peer relationships can encourage persistence, negative peer influence often leads students to reassess their educational choices, triggering dissatisfaction and eventual course shifts.

2.2. Burnout in MSI programs

Burnout is one of the most significant psychological hazards faced by students in MSI programs. Mathematics, laboratory sciences, and ICT courses are known for their rigor, heavy workloads, and competitive environments. Students frequently report emotional exhaustion, mental fatigue, and diminished enthusiasm caused by prolonged exposure to academic stress[6].

This state of exhaustion is not only detrimental to performance but also undermines motivation and overall well-being. Research shows that burnout is intensified when students enter MSI without strong intrinsic motivation, relying instead on external validation such as parental approval or societal prestige[7, 18]. Manifestations include declining grades, withdrawal from peers, cynicism toward school, and disengagement[8]. For many students, shifting to non-MSI disciplines becomes a restorative act—an attempt to recover balance, rediscover passions, and reclaim a sense of purpose[19].

2.3. Role strain and misalignment of expectations

Another significant factor driving course shifting is role strain, which arises when the demands of MSI programs conflict with students' personal strengths, goals, and identities. MSI courses typically require advanced analytical, technical, and problem-solving skills, as well as long hours of laboratory or coding work. For students whose aptitudes or interests do not align with these requirements, the academic experience becomes a source of stress and inadequacy[20].

The negative emotional consequences of this misalignment—such as anxiety, frustration, and lowered self-confidence—have been shown to undermine academic persistence[21]. Moreover, when students feel torn between meeting familial or societal expectations and pursuing personal well-being, role strain becomes even more pronounced[22-23]. In these cases, course shifting is not merely an escape from academic difficulty but a psychological necessity for self-preservation and growth.

2.4. Career Decision-Making Self-Efficacy (CDMSE)

Career decision-making self-efficacy (CDMSE) is a central psychological construct in understanding why students leave MSI programs. CDMSE refers to the confidence individuals have in their ability to make effective educational and career decisions. In MSI fields, students with low CDMSE often struggle with repeated failures or uncertainty about how their program relates to long-term goals[11]. This lack of clarity fosters anxiety and indecision, pushing students toward alternative fields.

Conversely, strong CDMSE enables students to make adaptive changes and align their academic paths with personal strengths and values[24-25]. Research shows that when students shift to non-MSI fields where they perceive greater fit and relevance, their CDMSE improves, empowering them to reclaim ownership of their academic journey[26]. This transformation allows students to envision clearer career trajectories, set realistic goals, and cultivate resilience.

2.5. Course shifting as a transformative process

Beyond these individual factors, course shifting from MSI to non-MSI disciplines can be understood as a transformative process. Students often confront fears of failure, societal judgment, and feelings of inadequacy. Yet, shifting also provides opportunities to redefine success in terms of personal fulfillment, passion, and balance[27-28]. Rather than being viewed as a failure, the act of shifting should be recognized as an exercise of agency and resilience, where students realign their academic pursuits with their authentic goals and identities.

This illustrates that course shifting is shaped by an interplay of external pressures, academic challenges, and internal struggles. Peer pressure, burnout, role strain, and CDMSE interact in ways that push students toward new academic directions. Institutions that acknowledge these realities and provide appropriate interventions—such as mentoring, counseling, and flexible learning environments—can better support students in navigating their academic journeys.

3. Methodology

3.1. Research design

This study employed a qualitative exploratory design to investigate the psychological factors influencing students' decisions to shift from Mathematics, Science, and Information and Communications Technology (MSI) programs to non-MSI disciplines. A qualitative approach was selected because it enables researchers to capture students' lived experiences, narratives, and perceptions—dimensions that are often overlooked in quantitative surveys. Exploratory designs are particularly useful in contexts where the phenomenon under study is complex, underexplored, and influenced by multiple intersecting factors[29]. By adopting this design, the research was able to delve into themes such as peer pressure, burnout, role strain, and career decision-making self-efficacy (CDMSE), providing a nuanced understanding of course-shifting behavior.

3.2. population and sampling

The population for this qualitative exploratory study comprised higher education students in the Philippines who had formally shifted from an initial Mathematics, Science, and Information and Communications Technology (MSI) program (e.g., mathematics, physics, chemistry, engineering, computer science, nursing) to a non-MSI program (e.g., education, social sciences, business, the arts). A purposive sampling strategy was used to recruit participants with direct experience of course shifting in order to obtain rich, information-dense accounts of the phenomenon[30].

Forty (N = 40) participants were recruited from multiple higher education institutions (public and private) across the Philippines to capture diverse socio-academic backgrounds and experiences. Inclusion criteria were: (1) had enrolled in an MSI program and subsequently shifted to a non-MSI program; (2) had completed at least one semester in their non-MSI program at the time of interview; and (3) were willing to provide informed consent for audio recording and the (anonymized) use of illustrative quotes. Exclusion criteria included: ongoing enrollment in the original MSI program (i.e., not yet shifted) and inability or unwillingness to provide consent for audio recording.

Table 1 summarizes participant demographic and background characteristics (age range, sex/gender, prior high-school strand, initial MSI program, final non-MSI program, year of shift, institution type, and interview mode). The purposive sample of 40 was judged sufficient based on the study's exploratory aims and on thematic saturation: after coding the first 30–35 interviews, no substantially new themes emerged and subsequent interviews primarily confirmed and elaborated existing patterns. A brief account of how saturation was assessed and the sample rationale is provided in Section 3.5 (Data Analysis).

Table 1. Participant Demographics Table

Participant ID	Age Range	Sex / Gender	HS Strand (Background)	Initial MSI Program	Final Non-MSI Program	Year of Shift	Institution Type	Interview Mode
P1	18–19	F	STEM	BS Computer Science	AB Communication	2022	Public	Online
P2	19–20	M	STEM	BS Engineering	BA Psychology	2021	Private	In-person
P3	20–21	F	Non-STEM (HUMSS)	BS Biology	BSEd English	2020	Public	Online
P4	18–19	M	STEM	BS Physics	BSBA Marketing	2021	Public	Online
P5	19–20	F	STEM	BS Nursing	BA Political	2019	Private	In-person

					Science			
P6	20–21	F	STEM	BS Chemistry	BSEd Science	2020	Public	Online
P7	21–22	M	STEM	BS IT	BA Mass Communication	2021	Private	Online
P8	18–19	F	Non-STEM (ABM)	BS Mathematics	BSBA Accounting	2022	Public	Online
P9	19–20	M	STEM	BS Engineering	BSEd TLE	2020	Public	In-person
P10	20–21	F	STEM	BS Nursing	BA Psychology	2021	Private	Online
P11	18–19	F	STEM	BS Chemistry	BSEd Math	2023	Public	Online
P12	21–22	M	Non-STEM (ABM)	BS IT	BA Communication	2021	Private	Online
P13	20–21	F	STEM	BS Physics	BSEd Science	2020	Public	Online
P14	18–19	M	STEM	BS Engineering	BSBA Management	2021	Public	In-person
P15	19–20	F	STEM	BS Biology	BS Psychology	2019	Private	Online
P16	21–22	M	Non-STEM (HUMSS)	BS IT	AB Political Science	2022	Public	Online
P17	18–19	F	STEM	BS Mathematics	BSEd English	2021	Public	Online
P18	19–20	F	STEM	BS Chemistry	BA Psychology	2020	Private	Online
P19	20–21	M	STEM	BS Engineering	BSEd Math	2020	Public	In-person
P20	21–22	F	STEM	BS IT	BA Communication	2021	Public	Online
P21	18–19	M	Non-STEM (ABM)	BS Biology	BSBA Marketing	2022	Private	Online
P22	19–20	F	STEM	BS Physics	BSEd Science	2020	Public	In-person
P23	20–21	F	STEM	BS Chemistry	BA Psychology	2021	Public	Online
P24	18–19	M	STEM	BS IT	BSEd TLE	2021	Private	Online
P25	19–20	F	STEM	BS Engineering	BSBA Management	2019	Public	Online
P26	21–22	F	STEM	BS Mathematics	BSEd English	2020	Private	In-person
P27	19–20	M	STEM	BS Chemistry	BA Communication	2022	Public	Online
P28	20–21	F	STEM	BS Biology	BSEd Science	2021	Public	Online
P29	18–19	F	Non-STEM (ABM)	BS IT	BSBA Accounting	2021	Private	Online
P30	19–20	M	STEM	BS Physics	BA Political Science	2020	Public	Online
P31	20–21	F	STEM	BS Engineering	BSEd Math	2021	Public	In-person
P32	21–22	M	STEM	BS Chemistry	BSEd Science	2020	Private	Online
P33	18–19	F	STEM	BS Nursing	BA Psychology	2022	Public	Online
P34	19–20	F	STEM	BS Mathematics	BSEd English	2021	Public	Online
P35	20–21	M	STEM	BS IT	BA Communication	2021	Private	Online

P36	21–22	F	STEM	BS Engineering	BSEd TLE	2020	Public	Online
P37	19–20	F	Non-STEM (HUMSS)	BS Biology	BA Psychology	2021	Private	In-person
P38	20–21	M	STEM	BS Physics	BSBA Management	2020	Public	Online
P39	18–19	F	STEM	BS Chemistry	BSEd Science	2022	Public	Online
P40	21–22	M	STEM	BS IT	BA Communication	2021	Private	Online

Table note. Participant IDs (P1–P40) are pseudonyms used to ensure anonymity. HS = High School; STEM = Science, Technology, Engineering and Mathematics; ABM = Accountancy, Business and Management; HUMSS = Humanities and Social Sciences. "Year of Shift" indicates the academic year when participants officially transferred to non-MSI programs.

3.3. Instrument

The primary research instrument was semi-structured interviews, chosen for their flexibility and depth. Semi-structured interviews strike a balance between guiding participants toward specific research objectives and allowing them the freedom to express personal stories, perspectives, and emotions[31]. The interview format enabled participants to share their stories openly while providing the researcher with flexibility to ask follow-up questions for richer insights. The interview guide was meticulously developed, addressing topics such as reasons for shifting courses, psychological and academic struggles in math programs, and the effects of the transition on participants' personal and educational lives. Before the main data collection phase, a pilot test of the interview guide was conducted with a small subset of participants to refine the clarity and relevance of the questions.

Table 2. Interview Guide Questions

Research Objective	Main Interview Question	Follow-Up Probes
1. To determine factors that lead to the shifting of students from Mathematics, Science, and ICT (MSI) programs to non-MSI programs.	1. What were your reasons for shifting from an MSI to a non-MSI course?	1. Can you recall a particular moment or experience that made you decide to shift? 2. Who influenced your decision most strongly? 3. How did your family or peers react to your decision?
	2. What experiences led to your final decision to shift?	1. What challenges or emotions did you experience before making the decision? 2. How did you weigh the pros and cons of staying versus leaving? 3. Did you seek advice or guidance? From whom?
	3. What mindset or perspectives changed when you shifted?	1. How do you now view your former course compared to your current one? 2. What lessons did you gain from that transition? 3. How has the shift affected your confidence or motivation?
2. To determine possible instructional and institutional interventions that may reduce course-shifting behavior from MSI to non-MSI.	1. What academic experiences contributed to your change in behavior toward MSI courses?	1. Which subjects or activities were most difficult for you? 2. How did your teachers or classmates affect your motivation? 3. Were there supports that could

Research Objective	Main Interview Question	Follow-Up Probes
		have helped you stay?
	2. What instructional strategies could sustain students' interest in MSI?	1. What types of classroom activities made you feel engaged? 2. How could lessons be made more relatable to real-life situations? 3. What would have encouraged you to continue in your MSI program?
	3. What institutional interventions could reduce course shifting?	1. What policies or programs could have prevented your shift? 2. How can universities improve career guidance and counseling? 3. What advice would you give institutions to help future MSI students?

3.4. Data gathering procedure

Participants were recruited through a combination of institutional referrals, electronic calls for participation, and peer networks. Initial contact letters were distributed to program chairs and guidance counselors in selected public and private higher-education institutions across the Philippines, requesting assistance in identifying students who had formally shifted from Mathematics, Science, and ICT (MSI) programs to non-MSI disciplines. The referral process ensured that potential participants met the inclusion criteria: (1) completion of at least one semester in the non-MSI program after officially shifting; (2) previous enrolment in an MSI-related course such as mathematics, biology, chemistry, physics, engineering, computer science, or ICT; (3) willingness to share their experiences in an interview; and (4) ability to provide informed consent for audio recording and for the use of anonymized quotations in research outputs.

Exclusion criteria included students who were only considering shifting but had not yet done so, those currently enrolled in both MSI and non-MSI courses, or those who declined to be recorded. Interested students contacted the researchers directly through institutional email or an online sign-up form. They were provided with an information sheet describing the study's objectives, confidentiality safeguards, and voluntary nature of participation.

Once eligibility was confirmed, each participant signed a digital or printed informed-consent form. Consent specifically covered: (a) permission to record the interview using audio software, (b) use of verbatim excerpts under pseudonyms (P1–P40), and (c) secure storage of recordings and transcripts for research purposes only. Participation was entirely voluntary, with the right to withdraw at any stage without penalty.

Interviews were scheduled at the participants' convenience and conducted either in person at designated campus offices or online via secure video-conferencing platforms. Each interview lasted approximately 30–60 minutes. Audio recordings were transcribed verbatim, with all personal identifiers removed prior to analysis. The resulting transcripts were coded and stored using encrypted folders accessible only to the research team.

3.5. Data analysis

The collected data were analyzed using Reflexive Thematic Analysis (RTA) as outlined by Braun and Clarke[32]. This approach was selected because it emphasizes researcher reflexivity, contextual interpretation, and the co-construction of meaning between participants and researchers. The first and second authors served

as the primary analysts, while the third author provided peer debriefing to ensure analytic rigor and credibility. All audio recordings were transcribed verbatim, and the first author carefully reviewed the transcripts multiple times to achieve immersion in the data. Using NVivo 12 Plus software, open coding was conducted inductively to identify recurring ideas, emotional cues, and experiential patterns without imposing pre-existing theoretical categories. Through several iterative rounds of coding and comparison, approximately 240 initial codes were generated and subsequently clustered into broader categories representing common experiences and psychological processes among course shifters.

These initial categories were further refined into coherent themes and subthemes through collaborative discussions among the research team. The emerging thematic map was repeatedly compared across transcripts to ensure that each theme demonstrated both internal consistency and external distinctness. Divergent cases and less frequent perspectives were deliberately retained to preserve the heterogeneity of participants' experiences. The resulting themes captured two primary dimensions of inquiry: (1) the factors influencing students' decisions to shift from Mathematics, Science, and ICT (MSI) programs to non-MSI disciplines, and (2) the instructional and institutional interventions that could mitigate course-shifting behavior. Each theme was supported with direct quotations from participants, coded using pseudonyms (e.g., P1, P20), to demonstrate analytic transparency and the link between interpretation and raw data.

Throughout the analysis, the researchers maintained reflexive memos documenting their assumptions, positionalities, and interpretive decisions, which helped minimize bias and enhance transparency. Rather than relying on numerical measures of intercoder reliability, theme validation was achieved through discussion and consensus-building consistent with the principles of RTA. Data saturation was determined when no substantially new codes or concepts emerged from the data; this point was reached after approximately 35 interviews, with the remaining five confirming thematic sufficiency. Therefore, the final sample of 40 participants was considered adequate to ensure both depth and breadth of understanding.

3.6. Ethical considerations

The study strictly followed ethical standards for research involving human participants. Before the commencement of data collection, the researchers sought formal approval from the appropriate institutional ethics review body in accordance with national and international research guidelines. All participants were thoroughly informed about the study's objectives, procedures, and their rights as respondents. Participation was entirely voluntary, and each participant signed an informed-consent form confirming their willingness to take part in the study, to allow audio recording, and to permit the use of anonymized quotations for scholarly publication. Participants were explicitly informed that they could withdraw from the study or decline to answer any question at any stage without penalty or adverse consequence[33].

To ensure confidentiality and data protection, pseudonyms (P1–P40) were used instead of participants' real names, and identifying details such as school names or personal information were omitted during transcription. The anonymized transcripts and audio recordings were securely stored in encrypted, password-protected folders accessible only to the research team. Backup copies were maintained in a secure external drive and scheduled for deletion after the completion of data analysis and publication. The study also upheld the ethical principles of autonomy, confidentiality, beneficence, and non-maleficence, ensuring that no participant was exposed to harm or discomfort as a result of their participation[34-35]. The researchers practiced reflexivity throughout the process to remain conscious of their positionality and potential biases, thereby safeguarding the integrity and trustworthiness of the findings.

4. Results

A total of forty (40) participants shared their experiences of shifting from Mathematics, Science, and ICT (MSI) programs to non-MSI disciplines. Thematic analysis generated two overarching domains: (1) factors influencing course shifting, and (2) instructional and institutional interventions to reduce course-shifting behavior. Within these domains, several major and minor themes emerged, including personal interest and passion, burnout and mental health struggles, role misalignment, and rediscovery of self-efficacy. Throughout this section, descriptive counts (e.g., "thirty-four participants") are used to indicate the number of participants who mentioned a theme. These counts serve a contextual and illustrative purpose rather than statistical measurement, consistent with qualitative research conventions that emphasize meaning and salience over frequency[32]. Participant codes (e.g., P1, P14, P32) are used to preserve anonymity while linking quotes to their respective narratives.

Research Objectives 1. To determine factors that lead to the shifting of students from Mathematics, Science, and ICT (MSI) programs to non-MSI programs.

Question No. 1. What were your reasons for shifting from an MSI to a non-MSI course?

1.1 *Personal Interest and Passion*

Thirty-three (33) participants revealed that their initial enrollment in MSI programs was primarily driven by social prestige, practicality, or family expectations rather than genuine personal interest. As they progressed, many realized that their intrinsic motivation lay elsewhere. Several participants described MSI coursework as "technically engaging but emotionally draining," emphasizing the absence of personal fulfillment.

> "I enrolled in Computer Science because everyone said ICT was the future, but coding felt lifeless. When I shifted to Communication, I finally felt that learning was something I wanted to do, not something I had to do" (P7).

> Similarly, another student explained, "I thought Biology would lead to stable career options, but it never inspired me. Literature made me feel connected and alive" (P12).

These reflections show that course shifting was not an impulsive decision but a process of reclaiming authentic interests that had been overshadowed by external pressures.

1.2 *Mismatch with Career Goals*

Twenty-eight (28) participants reported a misalignment between their MSI coursework and envisioned professional futures. They realized that although they excelled in scientific or technical subjects, their long-term ambitions leaned toward leadership, education, or creative work.

> "Physics trained me to think logically, but I wanted a career that involved working with people. Business Administration gave me that chance" (P9).

> "I was good at chemistry, but I couldn't see myself in a lab forever. Teaching allowed me to connect and inspire others" (P27).

This theme highlights career decision-making self-efficacy (CDMSE) as a dynamic process—one that strengthens as students move toward fields aligned with their perceived strengths and identities.

1.3 Burnout and Mental Health Struggles

Twenty (20) participants cited burnout as the decisive factor prompting them to leave MSI fields. They described exhaustion from long hours, heavy workloads, and constant assessments that left little room for rest or reflection. For many, burnout eroded their academic motivation and well-being.

> "Engineering drained me physically and mentally. I reached a point where I couldn't enjoy anything anymore. Shifting to Philosophy gave me back the space to think and breathe" (P5).

> "Nursing was so demanding that I forgot who I was. When I moved to Education, I started sleeping again—and smiling again" (P19).

These accounts reinforce the pattern that burnout is not simply an academic issue but a psychological survival response that motivates the search for balance and mental health.

Question No. 2. What experiences led to your final decision to shift?

2.1 *The Misfit Dreamer*

Thirty (30) participants admitted that their MSI enrollment was influenced by family and peer expectations. However, their engagement in extracurriculars or advocacy activities outside academics revealed interests in other fields. This shows how identity exploration beyond academics can act as a turning point for course shifting.

> "I originally enrolled in engineering because it was my parents' dream for me. I tried to convince myself I liked it, but deep down, I always felt disconnected. It wasn't until I joined a student organization that focused on social causes that I realized I wanted to pursue psychology" (P22).

> "Making the decision to shift courses is emotionally taxing, especially when it involves potentially disappointing family members. The fear of being seen as ungrateful or incapable can be overwhelming" (P35).

2.2 *The Burnout Survivor*

Thirty-four (34) participants, particularly those in nursing, engineering, and ICT, described how their decision to shift emerged after repeated episodes of exhaustion, stress, and declining performance. With the support of peers or mentors, they reframed shifting as a step toward personal well-being.

> "The long hours and emotional toll can cause me to feel overwhelmed. For those like me who aren't fully committed to the field, this stress can escalate, leading to mental health challenges like anxiety, depression, or burnout. After consulting with a counselor, I switched to Education because I enjoyed tutoring my siblings and friends" (P10).

> "Feeling lighter and more motivated was common among us who shifted to fields we genuinely enjoy. We often experienced improved mental health, a renewed sense of purpose, and better academic performance" (P17).

2.3 External Influences and Reevaluation

Twenty (20) participants admitted that their original MSI choice was based on its prestige or practicality. However, real-life experiences such as volunteer work, internships, or exposure to other fields forced them to reevaluate their goals.

> "As a first-generation college student, I initially chose Accountancy because it seemed practical and math-heavy courses looked impressive. But as I progressed, I realized I wasn't thriving emotionally or academically" (P29).

> "I entered my initial program thinking it was the logical choice for success. But over time, I felt disconnected from my own goals. What mattered to me most was contributing to my community" (P8).

Question No. 3. What mindset or perspectives changed when you shifted? Explain further.

3.1 *Realizing True Interests*

Twenty (20) respondents expressed that they thought they wanted to pursue medicine because of family expectations, but after starting, they realized their passion was in the arts. Shifting courses allowed them to follow their own interests, which made them happier and more motivated. When they were in the course their family chose, they felt constantly stressed and unmotivated. After they shifted, they felt a huge weight lifted off their shoulders.

> "I thought I wanted to pursue medicine because of family expectations, but after starting, I realized my passion was in the arts. Shifting courses allowed me to follow my own interests, which made me happier and more motivated" (P2).

> "It took a long time to convince my family that I was serious about my passion. I had to prove it by excelling in my new course. Shifting taught me how to stand up for what I want and explain my choices confidently" (P26).

3.2 *Overcoming Fear of Judgment*

Thirty (30) respondents expressed that at first, they were afraid of what people would think about them changing courses. But they realized their happiness and growth mattered more than pleasing others. They felt embarrassed about not succeeding in their first course, but they learned to accept that changing direction isn't a failure; it's growth.

> "I was afraid of what people would think about me changing courses. But I realized my happiness and growth mattered more than pleasing others" (P31).

> "Changing courses felt like admitting defeat, but I realized that finding the right fit is more important than sticking to the wrong path. Shifting helped me break free from that mindset" (P18).

3.3 Discovering Strengths and Weaknesses

Twenty (20) respondents expressed that their first course helped them understand what they were good at and what they struggled with. That self-awareness made their second choice feel like the right one. Shifting courses was humbling because they had to admit they weren't suited for their first path. They had to swallow their pride and acknowledge that they weren't suited for their first course. But it made them stronger and more determined to succeed in the right one.

> "Shifting courses was humbling because I had to admit I wasn't suited for my first path. But it made me stronger and more determined to succeed in the right one" (P6).

> "Looking back, my first course wasn't a waste. It helped me discover my real interests and shaped my decision-making process" (P21).

> "Engineering taught me discipline and problem-solving, even if I didn't stay. Those skills made me more confident when I shifted to Education" (P34).

Research Objectives 2. To determine possible instructional and institutional interventions that may reduce course-shifting behavior from MSI to non-MSI.

Question No. 1. What academic experiences contributed to your change in behavior toward MSI courses?

1.1 Struggling with Abstract and Highly Technical Content

Twenty-four (24) participants explained that they found MSI subjects such as calculus, advanced physics, chemistry, and programming too abstract and detached from daily life. They struggled to connect formulas and algorithms with practical meaning, which lowered motivation and confidence. These struggles illustrate that without practical connections, students perceive MSI content as inaccessible and irrelevant.

> "I could memorize formulas, but I didn't understand why we were solving them. The subjects felt too abstract, like they only existed on paper" (P15).

> "Programming was like speaking another language that I didn't know how to use in real life" (P3).

1.2 *Emotional Burnout and Academic Overload*

Thirty-one (31) participants reported that the volume of requirements—problem sets, laboratory reports, examinations, and projects—contributed to burnout. Many described MSI courses as demanding constant performance with little room for recovery. This demonstrates how MSI programs, while rigorous, may overemphasize performance at the expense of student well-being.

> "In engineering, it felt like my life revolved around deadlines. I barely had time to rest, which made me lose interest in studying" (P9).

> "The heavy workload in nursing drained me. I reached the point where I was just surviving, not learning anything at all" (P23).

1.3 *Exposure to Alternatives through Practical Experiences*

Twenty-two (22) participants said they discovered their true calling outside MSI through internships, volunteer work, and co-curricular activities. These experiences allowed them to apply their skills in social, creative, or people-centered contexts, which felt more fulfilling. This shows that external experiences often trigger career reevaluation and may pull students away from MSI when they reveal more rewarding alternatives.

> "When I joined community service projects, I realized how much I enjoyed helping people directly. It was completely different from what I felt in ICT classes" (P20).

> "Volunteering gave me purpose. I realized I could make an impact outside of the sciences" (P11).

Question No. 2. What instructional strategies could sustain students' interest in MSI? Elaborate further.

2.1 Making MSI Relevant to Real Life

Thirty-four (34) respondents emphasized that real-world applications must be integrated into MSI teaching. When abstract lessons are tied to concrete problems in healthcare, business, or technology, students

find the content more meaningful. This suggests that contextualized teaching is critical to sustaining engagement.

> "If our calculus problems were applied to real-life cases—like finance or construction—I would have been more motivated to learn" (P16).

> "In ICT, we coded exercises that didn't connect to real systems. I wish teachers showed us how programming was actually used in industries" (P4).

2.2 Promoting Collaborative and Peer-Supported Learning

Twenty-one (21) participants characterized MSI classrooms as highly competitive and isolating. They recommended collaboration-based strategies—such as group problem-solving, peer tutoring, and cooperative laboratory projects—to create a more supportive climate.

> "Working with peers helped me realize I wasn't alone in struggling with math. I gained confidence through study groups" (P14).

> "When teachers encouraged collaboration instead of competition, I felt less intimidated and more motivated" (P24).

This suggests that peer-supported learning can buffer anxiety and foster resilience, allowing students to persist longer in challenging MSI programs.

2.3 Encouraging Flexible Problem-Solving Approaches

Twenty-three (23) participants expressed frustration with the rigid and one-size-fits-all approach in MSI assessments. They wanted instructors to recognize multiple ways of solving problems, encouraging creativity rather than punishing deviations from strict methods. This theme emphasizes the importance of flexibility and learner-centered instruction in MSI.

> "In math, there was always one 'correct' way to solve things. But I discovered alternative approaches that worked. I wish teachers valued creativity more" (P28).

Question No. 3. What institutional interventions could reduce course shifting? Elaborate further.

3.1 Strengthening Foundational Skills through Bridge Programs

Thirty (30) participants admitted they struggled in MSI because their high school preparation was insufficient. They recommended remedial or bridge programs in mathematics, sciences, and ICT during the first year of college to level the playing field. This reflects the importance of early intervention to prevent academic disengagement.

> "The institution should implement remedial or bridge programs to address gaps in math skills for incoming students. Early struggles in foundational topics can lead to frustration later" (P25).

> "My high school math background was too basic. By the time college started, I was already behind" (P38).

3.2 Contextualizing MSI Programs to Real-World Careers

Twenty-seven (27) participants explained that they could not visualize the relevance of their MSI degree to actual jobs. They recommended case studies, industry immersion, and guest lectures to demonstrate the value of MSI programs. This suggests that career-contextualization is vital for future-oriented motivation.

> "We studied theory, but I never knew how it connected to real careers. Industry talks could have shown us why these skills matter" (P2).

> "Teachers should use realistic datasets to teach topics like statistics and calculus, such as analyzing climate data or healthcare trends" (P19).

3.3 Providing Career Guidance and Mentorship Opportunities

Twenty (20) participants stressed the need for systematic career counseling. Many only discovered alternative careers or realized the diversity of MSI pathways after shifting. Mentorship from alumni and professionals could guide students in making informed decisions. This underscores the role of mentorship and informed choice-making in reducing attrition.

> "If I had known that ICT had so many options—like systems analysis, data science, or cybersecurity—I might not have left" (P10).

> "Institutions should organize career talks featuring alumni from data science, robotics, and creative industries to show that math offers diverse career paths" (P33).

5. Discussion

Research Objective 1. To determine factors that lead to the shifting of students from Mathematics, Science, and ICT (MSI) programs to non-MSI programs.

The findings revealed that students' motivations to shift were primarily shaped by peer pressure and social expectations, burnout and academic overload, role strain and misalignment of expectations, and low career decision-making self-efficacy (CDMSE). Importantly, course shifting was not viewed solely as a sign of academic struggle but also as a transformative process of self-awareness and growth.

Peer Pressure and Social Expectations. Many students entered MSI programs not because of intrinsic interest but due to parental and peer influence. This is consistent with Frank et al.[15] and Greenlee et al.[16], who argued that external pressures often drive students toward STEM-related fields perceived as prestigious or practical. In the collectivist context of the Philippines, where family and community play central roles, this influence is magnified compared to individualistic cultures[36]. A unique finding of this study is that peer groups can also serve as protective agents—some students discovered their true interests in extracurricular or peer-led organizations, which helped them realize that their academic path was misaligned with their passions.

Burnout in MSI Programs. Burnout was one of the most frequently cited reasons for shifting. Students described relentless workloads, rigid grading systems, and constant pressure, echoing prior research that identifies burnout as a psychosocial hazard[37-38]. In the Philippine context, cultural pressure to endure academic stress for the sake of "prestigious" degrees intensified the problem. Students delayed shifting until burnout reached critical levels, which made the eventual decision both urgent and restorative.

Role Strain and Misalignment of Expectations. The theme of role strain revealed the psychological toll of MSI courses. Students felt trapped between academic expectations, their own abilities, and parental ambitions. Jiang et al.[39] emphasized that role strain undermines both academic performance and mental health, which was evident in participants' narratives. Unlike in some Western contexts where mentorship and counseling are more accessible, Philippine students often lacked structured support systems, leaving them to internalize the stress of conflicting roles. This exacerbated strain and accelerated the decision to realign with non-MSI courses that better suited their identities.

Career Decision-Making Self-Efficacy (CDMSE). Many participants admitted they lacked confidence in visualizing clear career trajectories within MSI programs. This aligns with Azhenov et al.[40], who noted that low CDMSE impedes decision-making and increases uncertainty. In contrast to other countries where robust career counseling services support students, Philippine institutions often provide minimal guidance, leaving students vulnerable to confusion. A unique contribution of this study is the finding that shifting itself became a way to rebuild CDMSE. By moving to fields aligned with their passions, students regained confidence in their choices and futures.

Course Shifting as Transformation. Beyond stress and disengagement, course shifting was described as a transformative experience. Echoing UNESCO[41] and Brundiers & Wiek[42], students framed shifting as an opportunity to rediscover passions, redefine success, and build resilience. Although stigmatized, shifting was not a failure—it was an act of agency, signaling the courage to realign academic paths with authentic goals.

Research Objective 2. To determine possible instructional and institutional interventions that may reduce course-shifting behavior from MSI to non-MSI.

Findings highlighted the need for instructional reforms (to make learning meaningful and flexible) and institutional interventions (to provide foundational, career, and psychological support).

Instructional Strategies. Students expressed frustration with abstract and highly technical content. This reflects the need for situated learning[43], where knowledge is tied to real-world contexts. By embedding math, science, and ICT concepts into concrete applications—such as healthcare, finance, or technology projects—institutions can make MSI more meaningful. Collaborative learning was also emphasized, consistent with Vygotsky's[44] Zone of Proximal Development, as students reported that isolation and competition in MSI courses worsened anxiety. Group projects, peer tutoring, and cooperative problem-solving could foster resilience. Finally, participants wanted instructors to embrace flexible, constructivist approaches[45], recognizing multiple problem-solving methods rather than enforcing rigid formulas. This shift would not only reduce intimidation but also nurture creativity, a critical skill in modern STEM fields.

Institutional Interventions. At the institutional level, students recommended bridge programs and remedial classes to strengthen foundational skills. This aligns with Tinto[46], who argued that academic integration in the first year is critical for retention. Participants also highlighted the need for career contextualization, including internships, alumni talks, and case studies that showcase diverse opportunities in MSI fields. Without seeing how their degree connects to real careers, many struggled to remain motivated. Finally, the call for career guidance and mentorship reflects the importance of enhancing CDMSE. Lent, Brown, and Hackett[13] demonstrated that career decision-making confidence improves when students receive structured guidance. Compared to Western institutions, Philippine universities lag in offering comprehensive career support, which exacerbates uncertainty and attrition.

These findings demonstrate that reducing course shifting is not simply a matter of "making MSI easier." Instead, it requires holistic strategies that balance academic rigor with relevance, collaboration, and psychological support. By doing so, institutions can address both the cognitive and emotional needs of MSI students, enabling them to persist and succeed.

Thus, while course shifting may be a necessary solution for some students, the findings suggest that systemic changes in MSI teaching and support systems can significantly reduce the prevalence of shifting, while still respecting students' autonomy to pursue paths aligned with their authentic passions.

However, this study has certain limitations. The reliance on self-reported data introduces potential biases, such as selective recall or social desirability, which may influence participants' narratives[47].

Furthermore, the focus on higher education students in the Philippines restricts the generalizability of the findings to other cultural or academic contexts. Future research could address these limitations by employing longitudinal designs, comparing cultural contexts, or examining the impact of institutional policies on course-shifting behaviors.

The findings of this study extend Social Cognitive Career Theory by demonstrating that the course-shifting experience functions as a process of reconstructing career decision-making self-efficacy rather than simply abandoning a chosen path. Unlike previous research that framed course shifting as a sign of academic disengagement or failure[28, 4], the present study reveals that students who left MSI programs engaged in purposeful self-assessment and re-alignment of goals—behaviors that indicate adaptive agency. The emergent themes illustrate how shifting restores students' sense of control, autonomy, and psychological well-being, suggesting that educational transitions can serve as developmental rather than disruptive events. Moreover, this study contributes region-specific insights into how cultural expectations, familial influence, and institutional structures interact with self-efficacy in career decision-making within Philippine higher education. In practical terms, the results support the integration of SCCT-based interventions—such as efficacy-building workshops, mentorship programs, and contextualized career guidance—to sustain motivation and persistence among MSI students.

6. Conclusion

This study examined the psychological and academic factors that influence students to shift from Mathematics, Science, and ICT (MSI) programs to non-MSI disciplines, while also identifying instructional and institutional measures that could help reduce course-shifting behavior. Through participants' narratives, it became clear that the decision to shift was shaped by a combination of peer and family expectations, burnout from demanding workloads, role strain from conflicting responsibilities, and low career decision-making self-efficacy (CDMSE). Shifting, however, was not merely an escape from difficulty but often a transformative process—an act of realignment that allowed students to rediscover passions, redefine success, and strengthen resilience.

At the same time, the study highlights that course shifting is not inevitable. Students emphasized the importance of reforms that could sustain engagement in MSI programs. Instructional strategies such as making lessons relevant to real-world contexts, fostering collaborative learning, and encouraging flexible approaches to problem-solving were identified as powerful tools for maintaining motivation. On the institutional level, bridge programs, career guidance, and mentorship opportunities emerged as critical in helping students build confidence, strengthen foundational skills, and see clearer pathways within MSI fields.

Taken together, these insights position course shifting as both a challenge and an opportunity. While it reveals gaps in how institutions support students, it also underscores the potential of educational reforms to reduce attrition without diminishing students' agency to pursue their authentic passions. For educators and policymakers, the findings call for the creation of learning environments that balance academic rigor with psychological support, and societal expectations with individual choice.

Looking ahead, future research should adopt longitudinal approaches to track how shifting affects students' long-term academic and career satisfaction, compare experiences across cultural contexts, and evaluate the effectiveness of institutional policies designed to prevent unnecessary attrition. By reframing course shifting not as failure but as part of the developmental journey, institutions can better support students in cultivating resilience, adaptability, and success in both academic and professional life.

Conflict of interest

The authors declare no conflict of interest

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