ENGINEERING EDUCATION

Self-Reported Legal Awareness and Professional Organization Messaging among Mechanical Engineering Students at Nueva Ecija University of Science and Technology: A Cross-Sectional Survey

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Published November 2026

Abstract

Background: Mechanical engineering students encounter regulatory information through coursework, professional student chapters, and official sources. This study describes their self-reported awareness of Republic Act No. 8495 and their experiences of professional organization messaging.

Methods: A cross-sectional survey dataset comprising 191 third- to fifth-year Mechanical Engineering students at Nueva Ecija University of Science and Technology was analyzed descriptively. Five-item sets assessed perceived legal awareness, organizational perceptions, and ethics/continuing professional development (CPD) preparedness. Internal consistency was assessed using Cronbach's alpha.

Results: All respondents reported PSME-affiliated chapter membership, and 110 (57.59%) also reported PSIM-affiliated membership. Most (190, 99.48%) reported no dedicated mechanical engineering law seminar. A total of 183 (95.81%) could not recall receiving R.A. 8495 information from a PSME-affiliated chapter; 182 (95.29%) could not recall such information from a PSIM-affiliated chapter. Official PRC/law sources were most trusted by 169 respondents (88.48%). None reported encountering inconsistent messages (183 no; eight unsure). Item-set alpha estimates were low or negative, precluding strong composite-scale interpretations.

Conclusions: Respondents expressed interest in professional participation but limited recall of chapter-specific law messaging. Findings support accessible regulatory orientation and better measurement of objective legal knowledge. The nonprobability or probability sampling status remains to be confirmed; results should not be generalized beyond the sample without justification.

Keywords: mechanical engineering education; Philippines; professional organizations; professional regulation; Republic Act No. 8495; self-reported awareness

1 Introduction

Republic Act No. 8495, the Philippine Mechanical Engineering Act of 1998, governs mechanical engineering practice in the Philippines. Its provisions address registration, professional responsibilities, and professional organization integration. Section 23 provides for an integrated and accredited organization while recognizing the possible existence of voluntary mechanical engineering organizations (Republic Act No. 8495, 1998). Distinguishing statutory requirements from communications distributed by professional organizations is therefore relevant to students preparing for licensure and professional practice.

Professional identity develops through educational experiences and interactions with professional communities (Trede et al., 2012). Engineering students may also negotiate their sense of professional membership as they progress through their programs (McCall et al., 2021). These insights motivate investigation of regulatory information channels, without presupposing rivalry or misinformation among organizations.

The present study examines NEUST Mechanical Engineering students' reported awareness of R.A. 8495, organizational affiliation, exposure to professional information, and perceived preparedness. Because the survey contains self-rating statements rather than a scored legal knowledge examination, the construct is described as self-reported legal awareness rather than demonstrated legal literacy.

1.1 Research questions

1. What are the respondents' profiles, affiliations, and sources of regulatory information?
2. How frequently do respondents recall receiving R.A. 8495 information from student chapters and faculty?
3. How do respondents rate selected statements about legal awareness, organizational perceptions, and professional preparedness?
4. Do respondents report encountering inconsistent professional or legal messages?
5. What measurement and sampling limitations qualify interpretation of these responses?

2 Related literature and conceptual basis

The Philippine Mechanical Engineering Act provides the statutory reference for examining student awareness of registration, professional responsibilities, and the status of professional organizations (Republic Act No. 8495, 1998). The distinction between a regulatory body, an accredited integrated organization, and other voluntary associations must be presented accurately; the presence of more than one organization does not itself establish contradictory messaging.

Trede et al. (2012) synthesize higher-education scholarship on professional identity development, highlighting the role of educational environments and professional socialization. McCall et al. (2021) examine professional identity negotiation among undergraduate engineering students. These studies provide a rationale for considering organizational participation as part of students' professional development, but do not establish effects of PSME or PSIM messaging at NEUST.

Self-assessed awareness is conceptually different from objectively demonstrated knowledge. The present instrument asks respondents to rate their familiarity, understanding, or willingness. Accordingly, results describe perceptions and self-reports. They cannot determine whether students correctly interpret the law. The conceptual focus is descriptive: student background and affiliations, reported exposure to messaging, and item-specific perceptions of legal awareness and professional preparedness.

3 Methods

3.1 Design and participants

This study uses a quantitative cross-sectional survey design. The supplied respondent-level workbook contains 191 records from third-, fourth-, and fifth-year NEUST Mechanical Engineering

students. The recruitment procedure, eligible population, sampling frame, response rate, and any nonresponse assessment were not documented in the supplied materials and require author confirmation. Consequently, no probability-sampling claim is made.

3.2 Survey instrument

The questionnaire includes Section A (student characteristics and affiliation), Section B (regulatory information exposure), Section C (five self-reported legal-awareness items), Section D (five organizational-perception items), and Section E (five ethics/CPD preparedness items). Sections C–E use five-point response formats. The C items concern R.A. 8495, APO mandate, PRC versus APO roles, scope/seal/penalties, and integration; the D and E items span heterogeneous organizational and professional-readiness topics. No objective legal knowledge test was present in the supplied workbook.

3.3 Data analysis

Counts and percentages were computed from respondent-level records (N = 191). Multiple-response source selections were counted against the full sample and therefore need not sum to 100%. Item means and sample standard deviations were calculated for numeric Likert responses. Cronbach's alpha was computed for each five-item set to assess internal consistency; given the mixed content of the sets, these estimates are diagnostic rather than evidence that a coherent scale exists. Inferential comparisons are not used to support substantive conclusions in this version because scale validity, sampling and prespecification remain unresolved.

4 Results

4.1 Respondent characteristics

Table 1. Respondents by year level (N = 191).

Characteristic	Count	Percent
3rd year	86	45.03%
4th year	71	37.17%
5th year	34	17.80%

All 191 respondents reported PSME-affiliated student chapter membership; 110 (57.59%) additionally reported PSIM-affiliated chapter membership. Thus, the relevant affiliation contrast is PSME-only versus dual-affiliated, not PSME versus PSIM as mutually exclusive groups. The primary-organization summary in the supplied tabulation contains compound selections, so it should not be interpreted as a single-choice variable without inspecting response coding.

4.2 Exposure and trust

Table 2. Exposure to R.A. 8495 information and trusted sources (N = 191).

Indicator	n	%
Did not attend dedicated ME law seminar	190	99.48%
Cannot recall PSME chapter R.A. 8495 information	183	95.81%

Indicator	n	%
Cannot recall PSIM chapter R.A. 8495 information	182	95.29%
Most trust PRC/official law	169	88.48%
Reported no inconsistent messages	0	0.00%

The response "cannot recall" does not mean that no message was provided. Likewise, no respondent selecting "yes" for inconsistent messages does not demonstrate that communications from organizations were objectively identical. Eight respondents (4.19%) selected "unsure."

4.3 Item-level ratings

4.3.1 *Self-reported legal awareness*

Table 3. Self-reported legal awareness items (Section C, N = 191).

Item	Mean	SD
C1 — aware RA8495 regulates me	3.83	0.99
C2 — understand APO legal mandate	3.30	1.03
C3 — distinguish PRC vs APO roles	3.21	1.15
C4 — familiar scope seal penalties	3.40	1.06
C5 — aware mandatory apo integration	3.54	0.97

Internal consistency (Cronbach's alpha): -0.007. The five items should not be presented as a validated unidimensional score.

4.3.2 *Organizational perceptions*

Table 4. Organizational perception items (Section D, N = 191).

Item	Mean	SD
D1 — PSME clarity APO pathways	3.69	0.91
D2 — PSIM career technical value	3.86	0.99
D3 — dual affiliation complementary value	3.81	0.98
D4 — chapters dependable regulatory info	3.61	0.95
D5 — trust chapter leadership governance	3.79	0.90

Internal consistency (Cronbach's alpha): 0.120. The five items should not be presented as a validated unidimensional score.

4.3.3 *Ethics and CPD preparedness*

Table 5. Ethics and CPD preparedness items (Section E, N = 191).

Item	Mean	SD
E1 — understand CPD renewal rules	3.27	0.99

Item	Mean	SD
E2 — recognize ME code of ethics	4.17	0.82
E3 — chapter prepares ethical practice	3.91	0.83
E4 — willing comply APO dues CPD	3.85	0.86
E5 — recommend joint RA8495 seminars	4.35	0.67

Internal consistency (Cronbach's alpha): -0.051. The five items should not be presented as a validated unidimensional score.

A comparatively high endorsement was recorded for recommending joint R.A. 8495 seminars (E5), whereas ratings on distinguishing PRC and APO roles (C3) were lower. These are item-level perceptions, not direct demonstrations of legal competence.

4.4 Data-quality observations

The workbook contains 10 missing responses in length of organizational involvement. The A6 primary-organization variable includes combined response categories, requiring an audit against the original form. Three pre-existing calculated-mean columns were empty and were not treated as respondent answers. These issues should be documented in a reproducible cleaning log before journal submission.

5 Discussion

The central pattern is strong organizational participation alongside limited recall of student-chapter communication specifically about R.A. 8495. This pattern is compatible with a curricular and co-curricular opportunity to make regulatory education more visible and memorable. It does not establish that either chapter failed to provide information, because recall may depend on wording, timing, and recognition of what counts as law-related messaging.

Most respondents identified official PRC or legal sources as most trustworthy, suggesting an opportunity for teaching activities that connect classroom and chapter announcements to primary regulatory materials. The results do not demonstrate conflicting messages between PSME and PSIM. On the contrary, none of the 191 respondents reported experiencing such conflict, although some were uncertain. The study therefore shifts the emphasis of the original proposal from presumed dual messaging conflict to regulatory-information exposure and students' perceptions.

Very low or negative internal consistency estimates are a substantive limitation. The C, D, and E sections cover different domains; averaging their items can conceal meaningful differences. Journal reporting should prioritize the individual items, and future studies should develop separate construct-specific scales, test content validity, and include objectively scored R.A. 8495 questions. Any causal language is inappropriate in this cross-sectional design.

6 Conclusion

In this sample of 191 NEUST Mechanical Engineering students, professional student-chapter participation was widespread, but recall of R.A. 8495-specific messaging from chapters was limited. Respondents predominantly trusted official regulatory sources and did not report direct experiences of conflicting messages. Because legal awareness was self-rated and the five-item sets showed poor

internal consistency, the findings should be interpreted as descriptive perceptions rather than evidence of legal proficiency or organizational effects.

7 Recommendations

NEUST and relevant student chapters may consider offering clearly labeled R.A. 8495 orientation sessions, linking educational materials to the current statute and PRC guidance, and evaluating these activities using an objective pre/post knowledge test. Further work should verify recruitment and response coverage, refine questionnaire wording, pilot distinct scales, and assess actual legal knowledge. The present dataset should be archived in anonymized form with a documented codebook and data-cleaning log.

8 Limitations

The study is limited to one institutional sample, with unconfirmed sampling and response-rate information; self-reported rather than objectively assessed legal knowledge; possible recall and social-desirability bias; low scale internal consistency; and unresolved questionnaire coding details. The dataset cannot support causal inference or direct comparisons with PSIM-only/nonmember groups, since all respondents reported PSME chapter affiliation.

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