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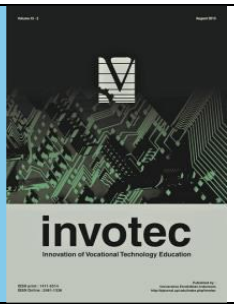

SELF-EFFICACY AND PROFESSIONAL COMPETENCE OF AUTOMOTIVE VOCATIONAL TEACHER

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ABSTRACT

This study examines the influence of self-efficacy on the professional competence of Automotive Productive Teachers in West Java Vocational Schools. Self-efficacy is an individual's belief about their ability to achieve goals, which plays an important role in teacher performance. Although previous studies have shown that teachers with high self-efficacy have better learning effectiveness, research in the context of Indonesian vocational education is limited. The study used a descriptive quantitative approach through a survey method of 48 Automotive Productive Teachers from various vocational schools in West Java with five automotive expertise programs. Data were collected through questionnaires and analyzed using Pearson correlation and simple linear regression. Results showed a strong ($r = 0.777$) and significant ($p < 0.05$) positive correlation between self-efficacy and professional competence. Regression analysis confirmed self-efficacy contributed significantly to professional competence ($F = 70.196$; $p < 0.05$). Demographic factors such as school type, age, and vocational specialization influenced the intensity of the relationship. Teachers in public schools and senior age groups showed higher self-efficacy and competence scores. The study suggests the importance of developing self-efficacy through continuous training to improve the quality of vocational education.

1. Introduction

Self-efficacy, conceptualized as an individual's belief in his or her capability to achieve specific goals, has been a central focus of many studies, including in the context of vocational education. In the realm of vocational education, where teachers' instructional quality and pedagogical competence have significant implications for learners' readiness for the world of work, an in-depth understanding of the influence of self-efficacy on instructional performance becomes even more essential. This is because self-efficacy is considered a fundamental determinant in shaping teacher performance and productivity in vocational education settings. Educators with high self-efficacy demonstrate superior capabilities in providing optimal support to learners, dealing with the complexity of challenges in a dynamic vocational education ecosystem, and implementing effective learning strategies (Na & Isa, 2024). By paying attention to self-efficacy, teachers can systematically strengthen pedagogical competencies that are the foundation of instructional practice.

According to Hoy et al. (2020), a teacher is expected to serve as a referential model, inspire learners, and contribute to the development of their character and moral values. This reality emphasizes that the practice of the teaching profession must be carried out based on relevant competencies and in line with the standards required in the educational context. According to Darling-Hammond & Oakes (2021), teacher competencies cover the spectrum of skills, knowledge and dispositions required to create effective and meaningful learning experiences for learners. Qualified educators have a deep understanding of the material substance, the ability to transform information with accessible methodologies, and the capacity to motivate learners in the learning process (König et al., 2020). This is in line with the argument that teachers must have adaptability to change, sensitivity to the diversity of learners, and capability in integrating technology (Fauzi & Ramadhan, 2024). Quality educators have a solid professional foundation, including integrity, accountability, and dedication to the holistic development of learners (Darling-Hammond et al., 2020). Comprehensively, teacher competencies represent a holistic and multifaceted spectrum of skills, thus becoming transformative agents in shaping the future of education.

The dimensions of teacher competence are manifested in four fundamental dimensions in accordance with the regulations of Law Number 14 of 2005 concerning Teachers and Lecturers. First, pedagogical competence which includes lesson planning, curriculum implementation, and evaluation of learning outcomes (Cahyana & Agustin, 2024). This involves teachers' capacity to provide substantive learning and develop instructional strategies that are responsive to learners' needs. Then, professional competence includes an understanding of ethics, professional standards, and participation in continuing professional development (Guerriero & Révai, 2018). Teachers with qualified professional competence always follow the latest developments in the world of education and continue to improve their professional capabilities. Furthermore, personality competence manifests the character and disposition of an educator, such as empathy, persistence, and self-confidence (Kim et al., 2019). Educators with a mature personality can build positive relationships with students and create a conducive learning environment. Finally, social competence includes the ability to interact with various stakeholders, such as learners, parents, and professional colleagues (Schleicher, 2020). Educators with good social competence demonstrate effective communication skills, team collaboration and positive relationship building with the school community. Collectively, the integration of these four competencies contributes to teacher effectiveness and positively impacts the learning process. Vocational High School (SMK) teachers have significant professional and moral responsibilities, in accordance with the regulation of the Regulation of the Minister of National Education of the Republic of Indonesia Number 22 of 2006. Vocational education is designed to produce graduates who have competencies and expertise that are aligned with industry needs, so as to optimize competitiveness in the job market. In addition, it is expected that SMK students also have sustainable self-development capabilities.

Therefore, although previous studies have highlighted self-efficacy and various dimensions of teacher competence, there is still a lack of research that specifically examines the influence of self-efficacy on the professional competence of automotive productive teachers in West Java vocational schools. This gap demands an in-depth investigation into how teachers' self-efficacy influences their understanding of professional ethics, engagement in continuing professional development, and application of automotive industry standards in learning practices (Guerriero & Révai, 2018; Darling-Hammond & Oakes, 2021). The impact of this study is expected to provide concrete empirical evidence on the role of self-efficacy in improving teachers' participation in continuing training, collaboration with industry, and professional accountability for learning quality. The practical implications include recommendations for education offices and SMK managers to design structured mentoring programs and industry simulation-based workshops, strengthen incentive policies for teachers who actively participate in professional certification, and develop professional development modules that focus on strengthening self-efficacy. Thus, the results of this

study are expected to strengthen the professionalism of automotive teachers, improve the relevance of the vocational curriculum to industry needs, and ultimately improve the competitiveness of SMK graduates in the labor market.

2. Method

This research implements a quantitative descriptive method, an approach used to systematically describe and analyze phenomena or characteristics of populations and samples (Creswell & Creswell, 2018). This methodology emphasizes quantitative data collection through measurement instruments such as surveys (Fraenkel et al., 2019). The research location includes several Vocational High Schools that have expertise programs in Automotive Light Vehicle Engineering (TKRO), Motorcycle Engineering and Business (TBSM), Heavy Vehicle Engineering (TKB), Automotive Body Technology (TBO), and Autotronics Technology (TOT) in several regions of West Java. The research population consisted of 48 Automotive Productive Teachers who were alumni of the Mechanical Engineering Education Study Program at the University of Education Indonesia (UPI). This study used a census approach involving all Automotive Productive Teachers from the UPI Mechanical Engineering Education Study Program of 48 people, which represented the total population (Nanjundeswaraswamy & Divakar, 2021). Data analysis uses a simple correlation coefficient test and a simple regression test with a prerequisite analysis or classical assumption test which includes normality test, linearity test, and heteroscedasticity test.

3. Results and Discussion

Based on the results of an investigation aimed at identifying the relationship and influence between self-efficacy and professional competence of vocational teachers, the empirical data collected was analyzed. The analysis was carried out on 48 Automotive Productive Teachers covering the Automotive Light Vehicle Engineering (TKRO), Motorcycle Engineering and Business (TBSM), Heavy Vehicle Engineering (TKB), Automotive Body Technology (TBO), and Autotronics Technology (TOT) skill programs. The results of the analysis and research findings are documented in Table 1 below.

Table 1: Self-efficacy and professional competence scores of teachers

No.	Responden	Age	School Origin	Major	X	Y
1	Respondent 1	25	SMK Angkasa Husein Sastranegara	TKRO	9,1	9,2
2	Respondent 2	23	SMK Angkasa Husein Sastranegara	TKRO	7,8	7,8
3	Respondent 3	22	SMK Angkasa Husein Sastranegara	TKRO	7,9	8,2
4	Respondent 4	25	SMK Angkasa Husein Sastranegara	TKRO	7,3	7,6
5	Respondent 5	44	SMK Angkasa Husein Sastranegara	TKRO	8,5	8,9
6	Respondent 6	34	SMK Angkasa Husein Sastranegara	TKRO	7,8	7,8
7	Respondent 7	45	SMK Assalaam Bandung	TKRO	7,9	7,9
8	Respondent 8	28	SMK Galuh Rahayu	TKRO	8,2	7,9
9	Respondent 9	25	SMK Galuh Rahayu	TKRO	7,8	7,7
10	Respondent 10	25	SMK Kartika XIX-1	TBSM	8,3	7,9
11	Respondent 11	24	SMK Karya Nasional Sindangwangi	TKRO	7,9	8,3
12	Respondent 12	23	SMK Medikacom	TKRO	8,3	8,6
13	Respondent 13	40	SMK Merdeka Soreang	TKRO	9,3	9,1
14	Respondent 14	25	SMK Merdeka Soreang	TKRO	7,5	8,3
15	Respondent 15	24	SMK Merdeka Soreang	TKRO	8,6	9,5

No.	Responden	Age	School Origin	Major	X	Y
16	Respondent 16	27	SMK Mitra Industri MM2100	TBSM	7,4	7,7
17	Respondent 17	23	SMK Pasundan 2 Bandung	TKRO	7,5	7,2
18	Respondent 18	25	SMK PGRI 2 Karawang	TBSM	8,2	7,8
19	Respondent 19	46	SMK PGRI Wanaraja	TBSM	7,9	7,4
20	Respondent 20	21	SMK Putra Bahari	TKRO	7,9	8,1
21	Respondent 21	48	SMK Putra Pajajaran	TKRO	9,3	9,5
22	Respondent 22	43	SMK Widya Dirgantara	TKRO	9,6	9,3
23	Respondent 23	25	SMK Widya Mukti	TBSM	7,5	7,3
24	Respondent 24	25	SMK YPPT Garut	TKRO	7,5	9,0
25	Respondent 25	46	SMKN 1 Babelan	TKRO	9,5	9,5
26	Respondent 26	30	SMKN 1 Cariu	TKRO	9,0	9,0
27	Respondent 27	56	SMKN 1 Cilegon	TKRO	8,2	6,6
28	Respondent 28	40	SMKN 1 Jamblang	TBSM	9,1	9,3
29	Respondent 29	26	SMKN 1 Kota Sukabumi	TKRO	9,5	9,4
30	Respondent 30	31	SMKN 1 Leuwimunding	TKRO	7,8	7,2
31	Respondent 31	41	SMKN 1 Majalaya	TBSM	8,3	8,2
32	Respondent 32	35	SMKN 1 Pebayuran	TOT	9,1	9,7
33	Respondent 33	37	SMKN 1 Plered	TKRO	7,3	7,5
34	Respondent 34	31	SMKN 1 Pusakanagara	TKB	7,9	8,3
35	Respondent 35	23	SMKN 2 Garut	TKRO	8,1	7,9
36	Respondent 36	49	SMKN 2 Garut	TKRO	7,9	8,7
37	Respondent 37	47	SMKN 2 Subang	TBSM	10,0	9,3
38	Respondent 38	43	SMKN 2 Subang	TKB	7,9	8,4
39	Respondent 39	46	SMKN 2 Tasikmalaya	TKRO	8,6	8,2
40	Respondent 40	60	SMKN 2 Tasikmalaya	TKRO	9,5	9,0
41	Respondent 41	29	SMKN 3 Sukatani Purwakarta	TBSM	8,0	7,5
42	Respondent 42	28	SMKN 3 Sukatani Purwakarta	TBSM	7,7	7,4
43	Respondent 43	38	SMKN 4 Kota Serang	TKRO	7,1	7,4
44	Respondent 44	38	SMKN 4 Kuningan	TBSM	7,8	7,8
45	Respondent 45	44	SMKN 6 Bandung	TKRO	8,4	8,1
46	Respondent 46	43	SMKN 6 Bandung	TKRO	9,0	9,1
47	Respondent 47	32	SMKN 7 Kabupaten Tangerang	TBSM	8,3	9,0
48	Respondent 48	44	SMKN 8 Bandung	TBO	7,9	7,5

Furthermore, the data were analyzed using Pearson correlation and simple regression techniques with ANOVA. The data interpretations that formed the basis for decision-making are listed in Table 2 and Table 3.

Table 2: Results of Data Analysis - Correlation

Pearson Correlations			
		Teacher's Self-Efficacy	Teacher's Competence
Teacher's Self-Efficacy (N=48)	Pearson Correlation	1	,777**
	Sig. (2-tailed)		,000
Teacher's Competence (N=48)	Pearson Correlation	,777**	1
	Sig. (2-tailed)	,000	
**. Correlation is significant at the 0.01 level (2-tailed).			

The observation in the efficacy column yields a significance value of 0.000, which is below the significance level of 0.05 (Table 2). This indicates a strong correlation between variable X and variable Y, indicating that self-efficacy has a significant relationship with professional competence. Furthermore, the competence column yields a significance value of 0.000, which is also below the significance level of 0.05. This confirms a strong correlation between variable Y and variable X, indicating that professional competence has a significant relationship with self-efficacy. Furthermore, the correlation value between self-efficacy and professional competence is 0.777. This value is in the interval 0.61-0.80, which indicates that the relationship between variables is at a strong correlation level (Field, 2018).

Table 3. Results of Data Analysis - Regression

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17,385	1	17,385	70,196	,000[b]
	Residual	11,392	46	,248		
	Total	28,777	47			
a. Dependent Variable: Teacher's Competence						
b. Predictors: (Constant), Teacher's Self-Efficacy						

The significance value of 0.000 <0.05 indicates a significant influence between the variables of Teacher Self-Efficacy and Teacher Professional Competence (Table 3). This is consistent with Field's (2018) argumentation which states that if the significance value is smaller than 0.05, then there is an influence of variable X on variable Y, but if the significance value is greater than 0.05, then there is no significant influence.

Next, the data is presented in demographic format to identify the mean scores of self-efficacy and professional competence based on several contextual factors.

Table 4. Average Score of Self-Efficacy and Professional Competence Based on Demographic Aspects

Demografphic Aspect	Frecuency	Average Self-Efficacy Score	Average Professional Competency Score
Type of School			
Public School	24	8,4	8,3
Private School	24	8,1	8,2
Age Gorup			
20-30 years old	22	8,0	8,1
31-40 years old	10	8,1	8,3
41-50 years old	14	8,6	8,5
51-60 years old	2	8,8	7,8
Vocational Mayor			

Demografphic Aspect	Frecuency	Average Self-Efficacy Score	Average Professional Competency Score
Light Vehicle engineering	32	8,3	8,3
Motorcycle engineering	12	8,2	8,0
Heavy Vehicle engineering	2	7,9	8,3
Automotive Body engineering	1	7,9	7,5
Autotronic Technique	1	9,1	9,7
Total Score	48	8,2	8,2

The research findings indicate that self-efficacy in aggregate has a significant effect on professional competence as reflected through teacher performance. The conceptual model built from this research illustrates the flow of influence: self-efficacy drives participation in continuous training, which then facilitates industry collaboration, and ultimately contributes to improved professional competence. The concept of self-efficacy that underpins this research is rooted in Bandura's (1997) social-cognitive theory, which defines self-efficacy as an individual's belief in his or her ability to organize and execute the actions required to achieve a particular goal.

In the context of vocational education, Bandura's theory is particularly relevant as it emphasizes four main sources of self-efficacy formation. Mastery experiences allow teachers to build confidence through practical achievements and gradual resolution of learning challenges. Observational learning (vicarious experiences) provides opportunities for teachers to learn from positive role models and adopt best practices from accomplished peers. Verbal persuasion in the form of constructive feedback and support from colleagues and supervisors helps build a supportive work environment. Meanwhile, management of physiological and affective states helps teachers manage stress, maintain emotional well-being and create an optimal work-life balance.

Analysis of demographic factors revealed interesting patterns in the distribution of self-efficacy among SMK productive teachers. The disparity between teachers in public and private schools reflects deeper structural complexities than just differences in remuneration. Teachers in public schools generally have better access to facilities, training and professional development. Civil servant status provides stronger career security, which directly affects their professional confidence. In addition, public schools tend to have more organized institutional support structures, creating an environment conducive to the development of self-efficacy.

The finding that the senior age group showed a 12% higher self-efficacy score can be understood through the perspective of teachers' professional development. Accumulated experience includes not only exposure to various learning situations, but also the development of effective pedagogical strategies and a deep understanding of learners' needs. Professional networks built up over the years allow senior teachers to establish strong industry connections, actively participate in communities of practice and even mentor junior teachers. These aspects collectively contribute to higher levels of self-efficacy.

The complexity of learning materials in automotive vocational education creates unique challenges that affect teacher self-efficacy. The fast-changing dynamics of technology demand continuous knowledge updates and adaptation to new technologies. Teachers with high self-efficacy tend to be more proactive in integrating the latest industry practices into their learning. This is supported by competency improvement strategies such as regular industrial internship programs, collaboration with automotive manufacturers, and industry needs-based curriculum development.

The practical implications of these findings encourage the development of comprehensive educational leadership programs. Instructional leadership training, structured mentoring programs and evidence-based evaluation systems are key components in supporting teachers' professional growth. Institutional support needs to be strengthened through adequate time allocation for professional development, implementation of performance-based reward systems, and provision of

facilities for collaboration and knowledge sharing. Strategies to empower teachers through effective induction programs, the establishment of professional communities of practice, and best practice sharing platforms are also essential.

A deeper theoretical reflection reveals that the integration of Bandura's self-efficacy theory with the vocational education context results in a more comprehensive understanding of continuous professional development. Self-efficacy acts as a catalyst in competence development, with experience and social support as key factors in the formation of professional beliefs (Klassen & Tze, 2014). The reciprocal relationship between self-efficacy and achievement, reinforced by positive feedback and a supportive work environment, creates a continuous cycle of professional growth. The socio-cultural context, including school culture and leadership, also plays an important role in shaping the learning climate that supports the development of collective efficacy (Tschannen-Moran & Hoy, 2007).

Although this study makes a significant contribution to the understanding of vocational teachers' self-efficacy, some areas still require further exploration. The methodological limitations of this study, including the use of self-reported data and a relatively small sample (48 teachers in West Java), point to the need for further research with longitudinal designs and mixed-methods approaches. Future research could expand the focus on the impact of specific interventions on self-efficacy, the role of technology in competency development, and contextual factors that influence collective efficacy. The development of evidence-based coaching models, strategies to enhance industry-education collaboration, and vocational education leadership development programs are also promising areas for future research.

4. Conclusion

Based on comprehensive empirical analysis, there is a significant correlation between self-efficacy and professional performance of automotive productive teachers. Subjects with superior levels of self-efficacy demonstrated more optimal instructional capabilities and productivity. Interventions in the form of continuous professional development programs and structured institutional support are imperative to strengthen this psychological construct. Consolidated self-efficacy implies educators' intrinsic belief in their competence to execute instructional processes and achieve set pedagogical objectives, thus facilitating effective learning processes and comprehensive acquisition of learners' competencies.

Improving self-efficacy can be implemented through professional capacity building, stimulation of intrinsic motivation, and strengthening pedagogical competencies. These strategies include continuous training, interprofessional collaboration, metacognitive reflection, exploration of innovative instructional methodologies and constructive feedback mechanisms. Policy implications indicate the urgency for educational institutions and stakeholders to construct a professional development framework that focuses on experiences of success and social persuasion, along with incentives and temporal allocation for participation in industry competency improvement programs and collegial mentoring, thereby strengthening educators' instructional capabilities in facilitating learners' transition to professional environments.

Conflicts of Interest

The authors declare no conflict of interest regarding the publication of the paper.

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