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Determinant Factors of Forming Individual Tacit's Knowledge: Teachers' Experience Perspective

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ABSTRACT

This study explores the factors influencing the exchange of tacit knowledge among teachers, which supports creativity, learning, and problem-solving in education. It focuses on how individual knowledge and the sharing of tacit knowledge are interconnected. The research examines four key factors: teaching experience (including education level and attitude), length of service, socialization, and training, and attitudes toward the Freedom of Learning Curriculum. A quantitative survey method was used to collect data from 123 vocational high school teachers between June 21-23, 2023. The participants were asked to complete an online questionnaire about their background and attitudes toward curriculum changes. Descriptive and inferential statistical analyses were applied to the data. The results show that teachers' experience-based knowledge is a crucial factor in acquiring and sharing tacit knowledge, which fosters human connections and collaboration. The findings also reveal that teachers' personal experiences and interactions play a key role in the exchange of unspoken knowledge, leading to improved relationships between teachers and students and expanding their social networks.

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1. INTRODUCTION

Humans possess a type of knowledge that significantly impacts their performance, judgment, and behavior in both work and social settings. Understanding the key knowledge factors that individuals need is crucial for supporting their performance in any organization, including schools. For teachers, having the right knowledge is essential for enhancing their performance and managing their work environment effectively, particularly in designing and implementing successful learning strategies (OECD, 2021). One critical form of knowledge that teachers must possess is tacit knowledge, which plays a vital role in their professional competence (Triana & Rugaiyah, 2023).

Polanyi (1966a) stated that humans actually have the ability to recognize and know more things than humans have the ability to tell what they know. One type of knowledge that is understood by humans but cannot be expressed formally is known as tacit knowledge. Tacit knowledge is a part of design knowledge that is so intertwined with the process of creating that its importance to design education is often overlooked and taken for granted. It is undervalued as a strong source of creativity and innovation because it is seen as a mysterious skill (Von-Krogh, Ichijo, & Nonaka, 2000). The fact that Polanyi argued in 1969 that "all knowledge is either tacit or rooted in tacit knowledge" shows how important it is. His famous work on tacit knowledge has been used as a key point of reference for many similar studies in many different professional fields over the years (Gascoigne & Thornton, 2014; Polanyi, 1969).

Since the beginning of the field of knowledge management and the sciences that are related to it (sociology, psychology), tacit knowledge has been a fundamental concept. Understanding knowledge assets in organizations requires, first and foremost, a distinction to be made between explicit and tacit knowledge (Polanyi, 1969). This distinction emerged as a result of the study of sociology. The distinction between explicit information, which can be codified and explained, and tacit knowledge, which is difficult to describe and difficult to communicate, was the primary focus of Nonaka and Takeuchi (1995). The scholarship surrounding tacit knowledge reflects the opaque quality of the knowledge itself. Both its nature and origins have been the subject of research. Some studies have suggested that tacit knowledge is based more on an individual's individual experience and reflection than a group's collective experience and reflection (Hau & Evangelista, 2007). This is due to the fact that tacit knowledge is more subjective and unstructured. Alternately, to the extent that tacit knowledge can be shared with other people, individuals must also be able to acquire such knowledge through interaction (Insch, McIntyre, & Dawley, 2008). However, it is possible that individuals will not acquire tacit knowledge through as many structured mechanisms or formal training programs as they will acquire explicit knowledge.

Collis and Moonen (2009) stated that knowledge building is "a process by which new knowledge is created for the individual or group based on a generative process". Even though they do not explain the generative process in detail, they did say that active participation in generative tasks is part of constructivist pedagogy. This is also relevant with statement of Scardamalia & Bereiter (2006) knowledge building as an educational approach is that it provides a straightforward way to address the contemporary emphasis on knowledge creation and innovation and most of constructivist approaches are the heart of knowledge building. In terms of design, these could be things like coming up with ideas or fixing problems. In the same way, results like new ideas or concepts, re-framing a problem, or creating new methods or processes are signs of knowledge building. Both the planning process and the results are based on tacit knowledge. So, based on the above, a working definition of tacit knowledge building is a process in which a person is actively involved in making new and tacit outcomes.

Tacit knowledge is the cumulative abilities and know-how of a specific individual gained via personal experience (Reed & DeFillippi, 1990) and implemented by deep comprehension and action (Oliva, 2014). Apart from that, tacit knowledge is also influenced by the individual's desire to learn, both learning by doing and learning by interaction (Kucharska & Erickson, 2023). As a result, the purpose of this study is to investigate the critical antecedents to support in an individual to gain knowledge consciousness and translate leading to inventive solutions quantitatively. It experimentally integrates tacit knowledge mastery through organizational procedures by sharing, and then assesses its impact on innovativeness internally and externally to be a competitive advantageous source (Ganguly, Talukdar, & Chatterjee, 2019). The investigation is required to better comprehend tacit knowledge acquisition while motivating a broader scientific discussion and comprehension of a challenging but fundamental issue in innovation empirically (Akhavan, Shahabipour, & Hosnavi, 2018; Asher & Popper, 2021).

Generally, tacit knowledge is acquired through secondary consciousness (Tsoukas, 2011). This is the foundation through direct experience or interpersonal interaction for implicit learning, also known as "learning by doing" or "learning by interacting" (Eraut, 2000; Muñoz, Mosey, & Binks, 2015). It relies on the personal's educational background, intelligence level, or abilities (Gascoigne & Thornton, 2014), culture as the external factor (Kucharska, 2021), and the situational context. It initiates the disclosure of

tacit knowledge. It is also necessary for organizations should consider all of these conditions while concentrating on carefully creating opportunities for tacit knowledge capture in specific situations to be successful in acquiring tacit knowledge. Considering the inherent complexity in identifying tacit knowledge, it is not unexpected that there are difficulties in documenting how it is gained and communicated (Gupta & Thomas, 2019). The research on tacit knowledge has predominantly been qualitative, frequently conducted through case studies (Thomas & Gupta, 2021). It presents a challenge in terms of their extension, but they provide valuable insights into the specific characteristics and facilitation of the subject matter (Garcia-Perez et al., 2020; Thomas & Gupta, 2021). Tacit knowledge, conversely, refers to a form of individual competence that is challenging to systematize or articulate verbally. It is inherent in individuals and encompasses their expertise, ability to solve problems, and analytical capabilities. Transferring implicit knowledge can be complex, as it pertains to an individual's personal experiences and insights. One's unique experiences and skills. Nevertheless, organizations have the ability to motivate individuals to share their tacit knowledge with others, a practice that can be advantageous for future members (El-Den & Sriratanaviriyakul, 2019). Recognizing and handling specific categories of unspoken knowledge might facilitate the transfer and expression of that knowledge (El-Den & Sriratanaviriyakul, 2019). Research has emphasized the significance of transferring both explicit and tacit knowledge, underscoring the necessity of easily available routes for exchanging valuable knowledge within organizations (Duan et al., 2022; Lei et al., 2021; Park et al., 2022).

Context and location are essential components of tacit knowledge. It is typically gained by repeatedly engaging in activities related to a particular subject. People become experts in a topic when they frequently face challenging situations and are able to draw meaningful conclusions from those experiences. Therefore, they are typically able to recognize meaningful patterns faster than novices (Chi, 2006; Dreyfus, 2004), but they will be unable to verbalize this and will frequently be unconscious of it (Polanyi, 1966a, 1966b, 1969). This is because they have more experience. In particular, when confronted with an unexpected circumstance, experts will immediately know what actions should be taken; in fact, it appears as though they do not even have to think about it. They simply continue doing what has traditionally been successful, and naturally, it continues to be successful (Dreyfus, 2004). Nonetheless, the fact that they are unable, on the whole, to verbalize their 'know-how' (Björklund, 2008) indicates that they are in possession of tacit knowledge (Polanyi, 1966a, 1966b, 1969).

Because tacit information cannot be verbalized, and because teachers may not even be aware that it exists and is controlling their decisions and actions, we looked for a method that would allow us to elicit teachers' tacit non-verbal ideas about the knowledge that is required for teaching. We found a method that was suitable for this, and it was successful. George Kelly, an American psychologist who developed the theory of personal construct psychology and proposed such an approach (Kelly, 1955), was the one who offered such a method.

Asher and Popper (2021) reviewed existing methodologies for eliciting tacit organizational knowledge. In line with, El-Den and Sriratanaviriyakul (2019), Gavrilova & Andreeva (2012), Hao, Zhao, Yan, & Wang (2017), Hoffman, Shadbolt, Burton, & Klein (1995) these researchers mentioned that there are some techniques having more possibilities to support the revelation of Tacit knowledge categorized as social interactions covering; brainstorming to case studies. Moreover, Bandura (1971) , referring to the social learning theory, stated that the phase of one’s learning is obtained from his/ her social interaction.

This study has goals to advance knowledge in determinant factors on how teachers' experience can develop tacit knowledge capability. It is based on their teaching experience perspective including educational level and teacher's attitude, length of work with teacher attitude, number of socializations, training and assistance with teacher attitude, and how to get information about the teacher's attitude towards the Freedom of Learning Curriculum to continuously. Specifically, it is done to renew their specialized knowledge and stimulate its tacit knowledge. The research deeper knowledge about the extent to which proximity framework can be applied in the educational field to enhance instructional process and innovation capability. Furthermore, by proving evidence that those four factors act as a mediating mechanism, the research provides a better understanding of the strategic role of proximity in

teaching-learning experience and organizational performance. The implications are relevant to guide policy makers and managers in other educational sectors, especially during the implementation of a new curriculum called Freedom of Learning in Indonesia, to leverage their proximity to other fields to increase specific know-how and innovation capabilities.

2. METHODS

2.1. Design and Sampling

The research design used in this study is a survey research design. This survey research design is a quantitative research procedure carried out to obtain a description of the attitudes, behaviours, and characteristics of the population obtained through samples in the population (Creswell & Guetterman, 2018). The type of survey used is Cross-sectional which can examine attitudes, beliefs, opinions or current practices. This type is in accordance with the research objective to measure the relationship between the attitude possessed by the teacher and the independent variables (level of education, length of work, organizational experience, number of socializations, training and mentoring, and how to obtain information about the Freedom of Learning Curriculum).

2.2. Instruments

Questionnaires are used to collect research data from respondents by dividing it into two parts. First, regarding the identity and background of the respondent. Second, it contains a statement regarding the teacher's attitude toward curriculum changes. These statements were answered based on a 4-point Likert scale (Strongly Agree, Agree, Disagree, Strongly Disagree). Analysis of the research validity test was carried out using the SPSS Statistics version 25 computer program, by correlating the value of each question item with the total value which is the sum of the values of each question item. The validity test in this study was carried out using Pearson's Product Moment. Then, a reliability test using the Alpha Cronbach method will be conducted. In this research, there are five determining factors related to the factors of tacit knowledge of teacher. The factors are the perspective of teaching experience, including the level of education and attitudes of teachers, the length of time working with teacher attitudes, the organization experience with teacher attitudes, the amount of socialization, training and assistance with teacher attitudes, and how to obtain information about Independent Learning Curriculum with teacher attitudes. These factors are mapped in table 1 below.

Table 1. Variable Dependent and Independent (Factors Determining)

	Variable	Category
Variable Dependent	Total value of the teacher's attitude	numeric
Variable Independent	Level of education	S1; S2;
	Teaching experience	0-3; 4 - 7; 8 - 11; 12 - 15; 16 - 19; 20 - 23; 24 - 27; 28 - 31; 32 - 35; years
	Organizational experience	1. Professional organizations 2. School organization 3. Social Organization (Social foundation) 4. Religious Organizations 5. Student Organization
	Attending socializations, training, mentoring	Never; 1; 2; 3; 4; 5; >5; times
	Way to get information about Freedom of Learning	1. Listen it from colleagues, principals, and/or supervisors 2. Read documents distributed via social media

Variable	Category
	3. Find out from the news in the mass media 4. Read the documents provided through the special portal on the development of the Independent Curriculum 5. Read other people's research results published in journals

2.3 Participants

The population of this study were high school/vocational high school teachers in Bandung city who were using the Merdeka Curriculum. Random sampling is used with the condition that all selected populations have the same opportunity to be sampled. 123 SMA/SMK (Senior/ Vocational High School) equivalent teachers participated in this study. There were 66 male respondents and 57 female respondents. Based on Table 3, it can be seen that most respondents, when viewed from age 30 - 34 years, are as many as 33 people.

Table 2. Demographic information of respondent

Variable	Respondent
Gender	
Male	66
Female	57
Age	
55 - 60	8
50 – 54	12
45 – 49	11
40 – 44	16
35 – 39	15
30 – 34	33
25 – 29	20
< 25	2

2.4 Data Analysis

Data analysis was performed using descriptive statistical analysis and inferential statistical analysis. Calculations using descriptive statistics were carried out to describe the tendency of score variations between one and another. Descriptive statistical analysis was used on the personal data and background of the respondents. Calculations using inferential statistics are performed to compare two or more groups. Inferential statistical analysis uses linear regression test calculations with the help of analysis using the SPSS Statistics version 25 computer program. This linear regression test is used as a measure of the form of the relationship between the independent variable and the dependent variable (Kurniawan & Yuniarto, 2016; Montgomery, Peck, & Vining, 2021). The coefficient of determination in this test gives the percentage contribution of the independent variable to the variation (increase/decrease) of the dependent variable. The dependent variable is in the form of a scale and the independent variable in this study is in the form of a categorical one which can be seen in Table 1.

2.5 Validity and Reliability Test Results

The research was conducted by preparing a list of questionnaire questions to be used. The questionnaire used in the study consisted of six questions regarding teachers' attitudes towards curriculum changes. After testing the validity, it can be seen the questions that have met the requirements and are said to be valid. Based on Table 3, the results show that all questions have a

Pearson Correlation of more than the r-table value of 0.254 (N=60). Judging from the significance value, all questions get a significance value of less than 0.05. Therefore, all questions regarding teacher attitudes towards curriculum changes were declared valid**.** The results obtained from the research have to be supported by sufficient data. The research results and the discovery must be the answers, or the research hypothesis stated previously in the introduction part**.**

Table 1. Test the Validity of Question Items

Question	Pearson Correlation	Significance
1	0.366**	0.004
2	0.643**	0.000
3	0.584**	0.000
4	0.597**	0.000
5	0.753**	0.000
6	0.628**	0.000

After testing the validity, the next step is to test the reliability. Table 4 shows that the Cronbach Alpha value is 0.609. In this test, an instrument is said to be reliable if the Cronbach Alpha reliability coefficient is more than 0.6. It can be concluded that the question of teacher attitudes towards curriculum change is reliable or consistent and can be used in subsequent analysis.

Table 2. Question Item Reliability Test Results

Reliability Statistics	
Cronbach's Alpha	N of Items
0.609	6

3. FINDINGS AND DISCUSSION

3.1 The relationship between educational level and teacher's attitude towards the Freedom of Learning Curriculum

Teachers must continue to develop their competencies, one of the ways is by taking formal education according to their academic field. Viewed from the level of education, most high school/vocational high school teachers are bachelor graduates with a percentage of 85% of the total respondents, while the other 15% have completed master's level education. This is based on the fact that high school/vocational high school teachers and the equivalent are required to have formal educational qualifications of at least S1 (Ta`ali, Mawardi, & Yanto, 2019). By attending formal education, it is hoped that teachers can obtain the latest information in the world of education and can equip students with a clear knowledge base and understanding (Nonaka & Takeuchi, 1995; Oliva, 2014).

Table 3. Linear regression test results at educational level

Variable	Sig.	R	R-square
Educational Level	0.005	0.253	0.64

The results of the linear regression test, which can be seen in Table 5, show that the magnitude of the correlation/relationship (R) value is 0.253. From this output, the coefficient of determination (R square) is 0.64, implying that the education level's effect on teachers' attitudes towards the Independent Curriculum is 64%.

3.2 The relationship between length of working and teacher's attitude towards the Freedom of Learning Curriculum

The results of the descriptive analysis which can be seen in Table 6 show that the majority of teachers work for 4-7 years with a total of 31 teachers. In second place, there are 24 teachers who work for 12-15 years. In addition, 23 teachers have worked for 0 – 3 years with two of them having worked for less than a year. While the few respondents, namely two teachers, have worked for 28-31 years.

Table 4. Respondents' Length of Working

Working Period	Frequency
0 - 3 years	23
4 - 7 years	31
8 - 11 years	21
12 - 15 years	24
16 - 19 years	4
20 - 23 years	8
24 - 27 years	5
28 - 31 years	2
32 - 35 years	5

The results of the linear regression test, which can be seen in Table 7, show that the correlation / relationship (R) value is equal to 0.686. From this output, the coefficient of determination (R square) is 0.471 which implies that the effect of length of work on teachers' attitudes towards the Independent Curriculum is 47.1%.

Table 5. Results of linear regression test on length of work

Variable	Sig.	R	R-square
Teaching experience	0.000	0.686	0.471

3.3 The relationship between organizational experience and teachers' attitudes towards the Freedom of Learning Curriculum

Based on Table 8, it can be seen that quite a lot of teachers joined organizations, both professional organizations, school-related organizations, social organizations, religious organizations, to student organizations while in college. The majority of teachers are members of professional organizations such as the Subject Teacher Consultation, the Principal Communication Forum, the Republic of Indonesia Teachers' Association, to study program associations, especially vocational teachers. However, there are still many teachers (N=56) who have not joined existing organizations.

Table 6. Respondent's organizational experience

Organizational Experience	Frequency
Have no experience	67
Professional organizations	32
School organizations	7
Social Organizations	4
Religious Organizations	1
College Student Organization	12

The results of the linear regression test, which can be seen in Table 9, show that the magnitude of the correlation / relationship (R) value is 0.206. From this output, the coefficient of determination (R

square) is 0.043 which implies that the influence of organizational experience on teachers' attitudes towards the Independent Curriculum is 4.3%.

Table 7. Results of linear regression test on organizational experience

Variable	Sig.	R	R-square
Organizational Experience	0.022	0.206	0.043

3.4 The relationship between the number of participating in socialization, training, and mentoring with the teacher's attitude towards the Freedom of Learning Curriculum

Since 2021, since the Independent Curriculum has been piloted, many high school/vocational school teachers have taken part in outreach, training, mentoring (see Table 10). As many as 24 teachers have participated in socialization, training, and mentoring twice. In addition, as many as 8 teachers have participated in socialization, training, and mentoring more than five times. However, 30 teachers have not had the opportunity to participate in these activities.

Table 8. The number of socializations, training, and mentoring

Duration	Frequency
Never	30
1 time	31
2 times	34
3 times	13
4 times	4
5 times	3
more than 5 times	8

The results of the linear regression test, which can be seen in Table 11, show that the correlation/relationship (R) value is equal to 0.359. From this output, the coefficient of determination (R square) is 0.129, which implies that the influence of the number of socializations, training, and mentoring on the teachers' attitude towards the independent curriculum is 12.9%.

Table 9. The results of the linear regression test on the number of socialization, training, and mentoring

Variable	Sig.	R	R-square
Attending socializations, training, mentoring	0.000	0.359	0.129

3.5 The relationship between how to get information and the teacher's attitude towards the Freedom of Learning Curriculum

The questions in this section are in the form of a checkbox, where teachers can choose more than one regarding their way of obtaining information related to the independent curriculum. Based on Table 12, the majority of teachers get information about the independent curriculum from colleagues, school principals and/or supervisors. Apart from that, many teachers read the documents provided through a special portal on the development of the Independent Curriculum. However, only a handful of teachers read other people's research results published in journals, through the Freedom of Teaching

Platform. This is based on the fact that the implementation of the Freedom of Learning Curriculum has only been running for three years, so references in the form of journals are still very limited.

Table 10. Way to get information

Way to get information	Frequency
A: From School principals, another teacher, or supervisor	86
B: Document on social media	14
C: News in mass media	16
D: Document on website Freedom of Learning	27
E: Journal	5

The results of the linear regression test, which can be seen in Table 13, show that the correlation / relationship (R) value is equal to 0.526. From this output, the coefficient of determination (R square) is 0.276 which implies that the effect of how to obtain information on the teacher's attitude towards the Independent Curriculum is 27.6%.

Table 11. The results of the linear regression test on how to get information

Variable	Sig.	R	R-square
Way to get information about Freedom of Learning	0.000	0.526	0.276

Discussion

This study aims to see how influential the level of education, the teacher's length of service, the experience of teacher organizations, the number of outreaches, training, and mentoring regarding Freedom of Learning, as well as how teachers get information about the curriculum, on teachers' attitudes towards curriculum changes. The findings reveal that education level is a variable that is quite influential on teacher attitudes in dealing with curriculum changes, with a percentage of 64%. This is based on the fact that professional development by attending formal education is key in helping teachers go through the process of educational transformation (Al Salami, Makela, & de Miranda, 2017). Like the results of research conducted by Gubbins & Dooley (2021) that, there is a need to focus more on an environment where one can feel safe to interact in developing knowledge through learning. That way, teachers have more high self-confidence to deal with changes in the existing curriculum (Zwiep & Benken, 2013).

Second, the teacher's length of service influences the teacher's attitude in dealing with curriculum changes by 47.1%. Judging from the data, 80% of teachers have less than 15 years of teaching experience. Judging from one of the problems regarding curriculum change and its implementation, teachers are not sufficiently equipped with professional development programs that support curriculum implementation (Park & Sung, 2013). Thus, it is possible that there are concerns in its application which are also based on limited information about the curriculum (Byrne & Prendergast, 2020; Ha, Wong, Sum, & Chan, 2008) revealed that, with longer teaching experience tend to have a more encouraging and positive attitude towards curriculum changes. Thus, in this study, the teacher's length did not influence the teacher's attitude towards curriculum changes.

Third, the way teachers get information about Freedom of Learning gets a percentage of 27.6% in dealing with curriculum changes. Based on the data, the majority of teachers seek information about Freedom of Learning from colleagues, principals, supervisors, as well as special portals about developing Freedom of Learning. However, it is undeniable that teachers are only limited to getting information about the contents of the curriculum, not with its implementation. Meanwhile, getting

information about success in implementing the new curriculum allows teachers to gain more confidence in dealing with curriculum changes.

Teacher participation in outreach, training, and mentoring does not have a significant effect on teachers' attitudes towards curriculum changes with a percentage of 12.9%. This is because most of the new respondents attended less than 3 socialization, training and mentoring activities. In fact, 30 other respondents never got the activity. It can be seen that the socialization that has been obtained regarding the curriculum has not been carried out intensely, so self-reinforcement towards curriculum changes has not been maximized. In addition, the effect of organizational experience on teachers' attitudes on Freedom of Learning only gets a percentage of 4.3%. Based on the data obtained, 32% of teachers joined professional organizations, but 54% of teachers from the total respondents did not join organizations inside or outside school. The organizations that teachers join do not always focus on curriculum areas, so attitudes towards curriculum changes are not formed optimally.

Increased tacit knowledge occurs due to interaction within the professional community which allows the exchange of information through oral, written and observation (Shim & Roth, 2008). Thus, teacher involvement in organization and socialization should always be encouraged to support increased mastery of tacit knowledge regarding the curriculum. Although in research, teacher involvement in organizations and socialization only has an influence in the range of 4 - 13 percent on curriculum attitudes. Tacit knowledge also encourages innovation in performance and work results in accordance with the needs and goals of the organization and policies (Ahmed, Shahzad, Aslam, Bajwa, & Bahoo, 2016), including the curriculum as a policy that teachers must implement in the classroom (Wahlström, 2023). Research about tacit knowledge of teaching is very limited. Grigorenko, Sternberg, & Strauss (2006) stated in their research that tacit knowledge is one of an important aspect of teacher effectiveness in teaching and their professionalism. Tacit knowledge of teaching is about how to handle challenging situations, or even crises in the classroom and learning activity. By tacit knowledge of teaching, teachers can deal with situation and problems through their experience, nonformal interaction in the past, and principles that teachers' belief.

4. CONCLUSION

Based on the findings of the current research, one can draw the conclusion that using tacit knowledge as an advanced form of pedagogical means in the modern era can result in the provision of cultural, experimental, structural, and educational support for the instructional process, which will ultimately lead to open innovation. The idea of open innovation refers to the process of socializing, forming linkages, and benefiting from the expertise of other individuals.

Tacit knowledge construction is a self-initiated internal process and an external socialized process that is enabled through the synergies of the various aspects as the determinant factors covering; educational level and teacher's attitude, length of work with teacher attitude, number of socializations, training and assistance with teacher attitude, and how to get information about the teacher's attitude towards the Freedom of Learning Curriculum. A setting that encourages the exchange of experiences is beneficial to the individual's process of building up their store of tacit knowledge. In order to produce tacit knowledge, it is necessary to perform an in-depth critical analysis or evaluation of the experiences or concepts that have been collectively experienced. this must be done using a variety of viewpoints and aspects. These findings are presented against the backdrop of social and collaborative learning settings. According to the findings of the study, these four elements of are the platforms for building sensibility, deconstructing and reconstructing meanings, and establishing new value judgements. They serve as both articulators and builders of tacit knowledge, playing the role of interacting actors in both processes. As a result of this, it has been suggested that the personal critical approach be utilized as a form of instructional methodology for the building of tacit knowledge.

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REFERENCES

Ahmed, F., Shahzad, K., Aslam, H., Bajwa, S. U., & Bahoo, R. (2016). The role of collaborative culture in knowledge sharing and creativity among employees The Role of Collaborative Culture in Knowledge Sharing and Creativity among Employees. *Pakistan Journal of Commerce and Social Sciences*, *10*(2), 335–258.

Akhavan, P., Shahabipour, A., & Hosnavi, R. (2018). A model for assessment of uncertainty in tacit knowledge acquisition. *Journal of Knowledge Management*, *22*(2), 413–431. https://doi.org/10.1108/JKM-06-2017-0242

Al Salami, M. K., Makela, C. J., & de Miranda, M. A. (2017). Assessing changes in teachers' attitudes toward interdisciplinary STEM teaching. *International Journal of Technology and Design Education*, *27*(1), 63–88. https://doi.org/10.1007/s10798-015-9341-0

Asher, D., & Popper, M. (2021). Eliciting tacit knowledge in professions based on interpersonal interactions. *The Learning Organization*, *28*(6), 523–537. https://doi.org/10.1108/TLO-03-2021-0035

Bandura, A. (1971). *Social Learning Theory*. New York: General Learning Press.

Björklund, L. (2008). The Repertory Grid Technique: Making Tacit Knowledge Explicit: Assessing Creative Work and Problem Solving Skills. *Researching Technology Education: Methods and Techniques*, 46–69.

Byrne, C., & Prendergast, M. (2020). Investigating the concerns of secondary school teachers towards curriculum reform. *Journal of Curriculum Studies*, *52*(2), 286–306. https://doi.org/10.1080/00220272.2019.1643924

Chi, M. T. H. (2006). Two Approaches to the Study of Experts' Characteristics. In *The Cambridge Handbook of Expertise and Expert Performance* (pp. 21–30). Cambridge: Cambridge University Press. https://doi.org/10.1017/cbo9780511816796.002

Collis, B., & Moonen, J. (2009). Collaborative Learning in a Contribution-Oriented Pedagogy. In *Encyclopedia of Distance Learning* (2nd ed., pp. 327–333). IGI Global. https://doi.org/10.4018/978-1-60566-198-8

Creswell, J. W., & Guetterman, T. C. (2018). *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (6th ed.). New Jersey: Pearson.

Dreyfus, S. E. (2004). The five-stage model of adult skill acquisition. *Bulletin of Science, Technology and Society*, *24*(3), 177–181. https://doi.org/10.1177/0270467604264992

Duan, Y., Yang, M., Huang, L., Chin, T., Fiano, F., de Nuccio, E., & Zhou, L. (2022). Unveiling the impacts of explicit vs. tacit knowledge hiding on innovation quality: The moderating role of knowledge flow within a firm. *Journal of Business Research, 139*, (4) 1489-1500. https://doi.org/10.1016/j.jbusres.2021.10.068

El-Den, J., & Sriratanaviriyakul, N. (2019). The role of opinions and ideas as types of tacit knowledge. *Procedia Computer Science*, *161*, 23–31. https://doi.org/10.1016/j.procs.2019.11.095

Eraut, M. (2000). Non-formal learning and tacit knowledge in professional work. *British Journal of Educational Psychology*, *70*, 113–136. Retrieved from http://www.ingentaconnect.com/content/bpsoc/bjep/2000/00000070/00000001/art00008

Ganguly, A., Talukdar, A., & Chatterjee, D. (2019). Evaluating the role of social capital, tacit knowledge sharing, knowledge quality and reciprocity in determining innovation capability of an organization. In *Journal of Knowledge Management* (Vol. 23). https://doi.org/10.1108/JKM-03-2018-0190

Garcia-Perez, A., Ghio, A., Occhipinti, Z., & Verona, R. (2020). Knowledge management and intellectual capital in knowledge-based organisations: A review and theoretical perspectives. *Journal of Knowledge Management*, *24*(7), 1719–1754. https://doi.org/ 10.1108/JKM-12-2019-0703

Gascoigne, N., & Thornton, T. (2014). *Tacit Knowledge* (1st ed.). London: Routledge. https://doi.org/https://doi.org/10.4324/9781315729886

Gavrilova, T., & Andreeva, T. (2012). Knowledge elicitation techniques in a knowledge management context. *Journal of Knowledge Management*, *16*(4), 523–537. https://doi.org/10.1108/13673271211246112

Grigorenko, E. L., Sternberg, R. J., & Strauss, S. (2006). Practical intelligence and elementary-school teacher effectiveness in the United States and Israel : Measuring the predictive power of tacit knowledge. *Thingking Skills and Creativity*, *1*, 14–33. https://doi.org/10.1016/j.tsc.2005.03.001

Gubbins, C., & Dooley, L. (2021). Delineating the tacit knowledge-seeking phase of knowledge sharing: The influence of relational social capital components. *Human Resource Development Quarterly*, *32*(3), 319–348. https://doi.org/10.1002/hrdq.21423

Gupta, V., & Thomas, A. (2019). Fostering tacit knowledge sharing and innovative work behaviour: an integrated theoretical view. *International Journal of Managerial and Financial Accounting*, *11*(3), 320–346. https://doi.org/10.1504/IJMFA.2019.104134

Ha, A. S., Wong, A. C., Sum, R. K., & Chan, D. W. (2008). Understanding teachers' will and capacity to accomplish physical education curriculum reform: The implications for teacher development. *Sport, Education and Society*, *13*(1), 77–95. https://doi.org/10.1080/13573320701780746

Hao, J., Zhao, Q., Yan, Y., & Wang, G. (2017). A Review of Tacit Knowledge: Current Situation and the Direction to Go. *International Journal of Software Engineering and Knowledge Engineering*, *27*(5), 727–748. https://doi.org/10.1142/S0218194017500279

Hau, L. N., & Evangelista, F. (2007). Acquiring tacit and explicit marketing knowledge from foreign partners in IJVs. *Journal of Business Research*, *60*(11), 1152–1165. https://doi.org/10.1016/j.jbusres.2007.04.006

Hoffman, R. R., Shadbolt, N. R., Burton, A. M., & Klein, G. (1995). Eliciting knowledge from experts: A methodological analysis. *Organizational Behavior and Human Decision Processes*, Vol. 62, pp. 129–158. https://doi.org/10.1006/obhd.1995.1039

Insch, G. S., McIntyre, N., & Dawley, D. (2008). Tacit knowledge: A refinement and empirical test of the academic tacit knowledge scale. *Journal of Psychology: Interdisciplinary and Applied*, *142*(6), 561–580. https://doi.org/10.3200/JRLP.142.6.561-580

Kelly, G. A. (1955). *The psychology of personal constructs. Vol. 1. A theory of personality. Vol. 2. Clinical diagnosis and psychotherapy*. W. W. Norton.

Kucharska, W. (2021). Leadership, culture, intellectual capital and knowledge processes for organizational innovativeness across industries: the case of Poland. *Journal of Intellectual Capital*, *22*(7), 121–141. https://doi.org/10.1108/JIC-02-2021-0047

Kucharska, W., & Erickson, G. S. (2023). Tacit knowledge acquisition & sharing, and its influence on innovations: A Polish/US cross-country study. *International Journal of Information Management*, *71*, 1–24. https://doi.org/10.1016/j.ijinfomgt.2023.102647

Kurniawan, R., & Yuniarto, B. (2016). *Analisis Regresi: Dasar dan Penerapannya*. Jakarta: Kencana.

Lei, H., Gui, L., & Le, P. B. (2021). Linking transformational leadership and frugal innovation: The mediating role of tacit and explicit knowledge sharing. *Journal of Knowledge Management*, *25*(7), 1832-1852. https://doi.org/10.1108/JKM-04-2020-0247

Montgomery, D. C., Peck, E. A., & Vining, G. G. (2021). *Introduction to Linear Regression Analysis* (6th ed.). John Wiley & Sons.

Muñoz, C. A., Mosey, S., & Binks, M. (2015). The tacit mystery: Reconciling different approaches to tacit knowledge. *Knowledge Management Research and Practice*, *13*(3), 289–298. https://doi.org/10.1057/kmrp.2013.50

Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford: Oxford University Press. https://doi.org/10.1016/0024-6301(96)81509-3

OECD. (2021). *Teaching as a Knowledge Profession: Studying Pedagogical Knowledge across Education Systems* (H. Ulferts, Ed.). Paris: OECD Publishing. https://doi.org/https://doi.org/10.1787/e823ef6e-en

Oliva, F. L. (2014). Knowledge management barriers, practices and maturity model. *Journal of Knowledge*

Management, *18*(6), 1053–1074. https://doi.org/10.1108/JKM-03-2014-0080

Park, M., & Sung, Y. K. (2013). Teachers' perceptions of the recent curriculum reforms and their implementation: What can we learn from the case of Korean elementary teachers? *Asia Pacific Journal of Education*, *33*(1), 15–33. https://doi.org/10.1080/02188791.2012.756391

Park, C., Ghauri, P. N., Lee, J. Y., & Golmohammadi, I. (2022). Unveiling the black box of IJV innovativeness: The role of explicit and tacit knowledge transfer. *Journal of International Management*, *28*(4), Article 100956. https://doi.org/10.1016/j.intman.2022.100956

Polanyi, M. (1966a). The Logic of Tacit Inference. *The Journal of The Royal Institute*, *41*(155), 1–18. https://doi.org/https://www.jstor.org/stable/3749034

Polanyi, M. (1966b). *The Tacit Dimension*. Chichago: University of Chicago Press. Retrieved from https://monoskop.org/images/1/11/Polanyi_Michael_The_Tacit_Dimension.pdf

Polanyi, M. (1969). *Knowing and Being* (M. Grene, Ed.). Chichago: The University of Chicago Press.

Reed, R., & DeFillippi, R. J. (1990). Causal Ambiguity, Barriers to Imitation, and Sustainable Competitive Advantage. *Academy of Management Review*, *15*(1), 88–102. https://doi.org/10.5465/amr.1990.4308277

Scardamalia, M., & Bereiter, C. (2006). Knowledge Building: Theory, Pedagogy, and Technology. In R. K. Sawyer (Ed.), *Cambridge Handbook of the Learning Sciences* (pp. 97–118). New York: Cambridge University Press.

Shim, H. S., & Roth, G. L. (2008). Sharing Tacit Knowledge Among Expert Teaching Professor and Mentees: Considerations for Career and Technical Education Teacher Educators. *Journal of Industrial Teacher Education*, *44*(5), 1–24. https://doi.org/10.1017/S0376892900006251

Ta`ali, T., Mawardi, A., & Yanto, D. T. P. (2019). Pelatihan PLC dan Elektropneumatik untuk Meningkatkan Kompetensi Profesional Guru SMK Bidang Ketenagalistrikan: Pendekatan Revolusi Industri 4.0. *JTEV (Jurnal Teknik Elektro Dan Vokasional)*, *5*(2), 88. https://doi.org/10.24036/jtev.v5i2.106722

Thomas, A., & Gupta, V. (2021). Tacit knowledge in organizations: Bibliometrics and a framework-based systematic review of antecedents, outcomes, theories, methods and future directions. Advance online publication. *Journal of Knowledge Management*, *26*(4), 1014–1041. https://doi.org/10.1108/JKM-01-2021-0026

Triana, & Rugaiyah. (2023). Tacit knowledge sharing to improve teachers' performance. *Jurnal Akuntabilitas Manajemen Pendidikan*, *11*(1), 49–56. https://doi.org/10.21831/jamp.v11i1.56741

Tsoukas, H. (2011). How Should We Understand Tacit Knowledge? A Phenomenological View. In M. Easterby-Smith & M. A. Lyles (Eds.), *Handbook of Organizational Learning and Knowledge* (2nd ed., pp. 453–476). Chichester: John Wiley & Sons. https://doi.org/10.1093/oso/9780199275571.003.0007

Von-Krogh, G., Ichijo, K., & Nonaka, I. (2000). *Enabling Knowledge Creation: how to unlock the mystery of tacit knowledge and release the power of innovation*. Oxford: Oxford University Press.

Wahlström, N. (2023). Curriculum policy, teaching, and knowledge orientations. *Teachers and Teaching: Theory and Practice*, *29*(3), 259–275. https://doi.org/10.1080/13540602.2022.2159364

Zwiep, S. G., & Benken, B. M. (2013). Across Mathematics and Science Through Content- Rich Learning Experiences in a Professional. *International Journal of Science & Mathematics*, *11*, 299–325.