

The effect of external learning on vocational high school performance with mediating role of instructional agility and product innovation efficacy in Indonesia

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CHRONICLE

Article history:

Received: June 30, 2020

Received in revised format:

June 30 2020

Accepted: July 12, 2020

Available online:

July 12, 2020

Keywords:

External Learning

Instructional Agility

Product Innovation Efficacy

VHS performance

Structural Equation Modelling

(SEM)

Vocational High School (VHS)

ABSTRACT

Involving industry in the implementation of Vocational High School (VHS) policy not only provides knowledge into business needs, but also allows industries to affect strategies and programs for learning and teaching across the VHS overall. This study suggests that external learning contributes to the instructional agility, and product innovation efficacy, resulting in VHS performance. The research examines the analysis of structural equation modelling (SEM) based on empirical data gathered from 129 Vocational High Schools in Bali Province, Indonesia. The research attempts to focus specifically on how instructional agility, and product innovation efficacy mediates the influence of external learning on VHS performance in Indonesia. The study shows that external learning has no impact on VHS performance, while it indirectly improves the VHS performance through all of instructional agility, and product innovation efficacy.

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1. Introduction

A nation's existence could be viewed from the progress of its economy and welfare of individuals who are strongly affected by the quality of vocational education as an effort to foster the employability of skilled worker in the workplace (Grosch, 2017). Vocational school belongs to a formal education system that is specifically linked to the preparation of students for both paid and unpaid jobs, or to further preparation for occupations that do not need a bachelor's degree (Bamalli, 2014). As the industry grows more competitive and technological developments, company needs graduates who are skilled and knowledgeable to contribute in a technical way to the market how, where and when business transactions are conducted. Hence, it becomes more challenging for Vocational High School (VHS) how best to better prepare ready graduates from the industry. In Indonesia, Vocational High School (VHS) addresses the concerns and demands of highly complex labour skills requiring the workforce to be able to perform effectively and to provide job skills in alignment with the preferences of today's workforce. To deal with this challenge, the relationship between external parties can direct the design of more applicable educational materials which, in addition to specific knowledge acquisition, enhance skills and competencies development. Following Revans (1982), practice-based learning extends outside of solving problem to obtaining new knowledge and insights and improving essential analytical problem-solving and utilization skills which lead to new the curriculum. This can be facilitated by the use of dynamic activities and tasks that have a workplace environment. Moreover, there are many barriers to implement the external learning between educational institutions and industries. For instance, the implementation of external learning has no effect to improve the institution's performance because there is a failure to achieve closer alignment of the skills and competences graduates exhibit, and to enrich the learning experience through practical insight (Hoang & Rothaermel, 2010;

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Bresman, 2010; AlMulhim, 2020; Paladino et al., 2016; Tse et al., 2016; Plewa et al., 2015). Whereas many research studies showed that external learning improve organization's performance (Hu, 2014; Aragón-Correa et al., 2007; Jiménez-Jiménez & Sanz-Valle, 2011; Bierly & Daly, 2007). Therefore, this in conclusion effort to fill this research gap by analyzing the impact of external learning on vocational high school performance in Bali Province, Indonesia.

Subsequently, the knowledge-based view (KBV) theory seeks to classify the conditions which can lead an individual to acquire and establish organizational knowledge (Nonaka, 1994). The KBV suggests a collaborative curriculum development and implementation to ensure colleges are able to produce students with the expertise and skills needed for the workforce (Ssebuwufu et al., 2012). Industries can play a key role in product innovation efficacy such as curriculum design and instructional agility such as curriculum delivery, tend to range from insight to systematic technical aspects in procedure performed, measuring structures and concept principals or informal methodologies, and engagement in ad hoc activities, often depending on individual relationships (Siegel et al., 2004). To fulfill this gap, this study examines how external learning affect the instructional agility, and product innovation efficacy and the resulting VHS performance. Collaboration in the product innovation from curriculum design and implementation of instructional agility are the capacity to improve education (Forsyth et al., 2009). The impact of college-industry collaboration on education involves design of curriculum development at all levels of college programs, courses and related on the content (Healy et al., 2014) that is reflected to product innovation efficacy. Whereas the distribution of curriculum content in this sense for responding market demand is known as the delivery of services, courses, and material to students across a wide variety of methods, such as workshops, development projects, and trainings (Davey et al., 2011) that is a part of the instructional agility. Involving with academic institutions in curriculum design and delivery not only enables industries to affect future workforce vocational training but also encouraging with potential future workers throughout their educational experience. Therefore, to create the kind of graduate that is flexible and able to meet the requirements educational institutions will take a more innovative and externally oriented approach to curriculum product of design and implementation, with varied and quickest-changing demands of the industry. Furthermore, in order to initiate such empirical research, this study aims to make the following contributions: First, a VHS acquires market expertise and experience that will enhance the curriculum that meets industry needs. Second, a VHS prepares graduates for future employment challenges in industry through increasing practical knowledge and experience based on market demands. Third, a VHS provides an understanding of industry needs by teaching curriculum design and implementation based on real issue. In this paper, the researchers will examine how external learning significantly influence the VHS performance, and further examine how instructional agility and product innovation efficacy bridges the relationship between external learning and VHS performance.

2. Literature Review

2.1 Relationship between External Learning and Vocational School Performance

Knowledge-based literature stresses the important value of organizational knowledge (Grant & BadenFuller, 1995; Huang et al., 2008). Knowledge-based view theory aims to identify the factors that can lead an entity to obtain and create knowledge of organization (Nonaka, 1994; Huang et al., 2008). Based on the theory of knowledge-based views, external learning can be described as knowledge obtainment and development through cross-institutional learning through collaborative customer and industry problem solving (Huang et al., 2008). External learning occurs as new information arrives from outside the organization and is then transmitted within the organization; it is primarily due to the organization's ability to acquire, recognize, adapt and leverage environmental knowledge (Cohen and Levinthal, 1990). A strong partnership with associates of industry can provide a basis for transmitting tacit knowledge with the company (Linderman et al., 2004). Thus, the tacit knowledge obtained through external learning can be adopted as the firm's explicit knowledge (Nonaka, 1994). The external learning may prosper from a long-term partnership with the manufacturers. External learning arises from firms in several ways, such as daily participation of firms in the latest customize of product or of process and enhancement of output quality (Schroeder et al., 2002). Organizations also recognize within inter-organizational networks (Knight, 2002; Lane & Lubat-kin, 1998). Distinct node industries capture information and knowledge to ensure that organisations match a variety of information and knowledge requirements (Uzzi, 1997). Activities concerning contextual learning (such as attempting out to find out about trends in customers and what industries are doing) allowing organizations to analyse their task environment and how it changes. The implementation of this expert knowledge will give organisations adapt to new conditions and take advantage of new opportunities to improve performance (Bresman, 2010; Jiménez-Jiménez & Sanz-Valle, 2011). Based on these arguments, the proposed hypothesis is:

H₁: External Learning has a positive impact on Performance.

2.2 Relationship between External Learning and Product Innovation Efficacy

External learning enables the organization to produce innovation-enhancing abilities and innovation that has a positive impact on performance (Baker & Sinkula, 2002). Innovation involves people to acquire existing knowledge and to share that knowledge within the organization (Cohen & Levinthal, 1990; Coombs & Hull, 1998). The knowledge acquired from outside the organization depending on the organization's ability to absorb new ideas, i.e. the ability of the organization to understand, assimilate and apply new external knowledge for business purposes (Cohen and Levinthal, 1990). Innovation also needs to

evolve and expand the current knowledge that provides information and knowledge sharing by the employees. Innovation occurs when individuals share their knowledge with the organization and new and common insights are derived by this shared knowledge (Nonaka, 1994). Chesbrough (2006) suggests that the acquisition and use of external knowledge is especially essential in order to create innovation. In addition, the acquisition and utilization of external knowledge is closely related to internal Research and development activities. The blending of external professional skill and internal basic research contributes to innovation efforts being successful (Freeman, 1991).

Yli-Renko et al., (2001) and Jiménez-Jiménez & Sanz-Valle (2011) find a positive relationship between knowledge transfer and product innovation. Weerawardena et al., (2006) and Alegre & Chiva (2008) indicate that three kinds of learning affect the efficacy of innovation such as product replacements being phased out. Finally, Chang and Cho (2008) conclude that exchanging memory, using external information and using formal knowledge retention procedures improve innovation. Therefore, the following is the proposed hypothesis:

H₂: External learning is positively related to product innovation efficacy.

2.3 Relationship between Product Innovation Efficacy and Performance

By constructing an improved brand image that reflects competitive advantage and superior performance, innovation has a significant impact on organization performance (Walker, 2004). Product innovation are those which present new or significantly improved goods and/or services in terms of their capabilities, user friendliness, elements or sub-systems (Martínez-Ros, 2019). Studies of Li and Atuagene-Gima (2001) and Shashi et al. (2019) have positive impact between product innovation and performance that product innovation also appears as a critical driver of innovative performance. Gunday et al. (2011) states that investing more in innovative capabilities and support new attempts introduce innovative performance. Innovative performance could play a vital role in this system as it acts as a gateway in which positive effects of types of innovation are collected and then transmitted to production, market and financial performance. Organizations require creativity to enhance real-life performance organisation conditions change existence (Aragón-Correa et al., 2007). Based on these arguments, the proposed hypothesis is:

H₃: Product innovation efficacy is positively related to VHS performance.

2.4 Relationship between External Learning and Instructional Agility

The instructional agility idea is identified through adopted as for wider and multidimensional existence of organizational agility (Swafford et al., 2006). Hence, the sense of "agility" must be explained before continuing to concentrate on the education context. Agility is seen as the holistic collaboration of all aspects and the competitive foundations of an organization, such as acceleration, flexibility, creativity, efficiency and competitiveness (Yusuf et al., 1999). Agility is an organizational way to generate an efficient, low-cost, high-quality, detailed product range based on individual customer's requirements (Fliedner & Vokuraka, 1997). From the perspective of school education, This dynamism is important not only through terms of content or information, but also in terms of teaching methods, including all relevant aspects of pedagogy. The education agility is to blend the 'educational wealth enhancing' capabilities of recent technical developments and the 'educational scope enhancing' opportunities provided by social networking (Gupta & Bharadwaj, 2013). The ability to obtain the appropriate level of achieve and wealth capabilities to standardized and address the problems and opportunities afforded by the dynamic and ever-changing business industry to school education (Gupta & Bharadwaj, 2013). It allows education schools not only to feel and react, but also to take lessons from their past and present behaviour so that they can evaluate alternative possible trends and be even more agile in effect. This agility, which fundamentally embraces the nature of an successful vocational school education and is provided to students in vocational schools – training them to become skilled workers.

An agile organization should adjust to the competitive and unpredictable market demand. A organization that constantly learns and then accumulates customer experience and expertise from its industry partners can help lead to an agile (Gligor & Holcomb, 2012). According to Day (1994b), an organization has a better way to discover and to respond on marketplace dynamics and disruptions by learning about the customers, competitors and the market situation. The viewpoint of learning from industry partners enable the organisation to be better prepared to adopt improvements in a satisfactory way, with the latest insight of procedures, methods, capabilities and quality assurance (Ngai et al., 2011). Thus, external learning could be assumed to enhance an organisation's responsiveness, such as consumer expectations and demand response, that are also characteristics of agility. Therefore, the following is the proposed hypothesis:

H₄: External learning is positively related to the instructional agility.

2.5 Relationship between Instructional Agility and Performance

The Agile Higher Education thesis sets out four fundamental principles for the extension Agile principles for education: (a) teachers and students over administration and infrastructure; (b) knowledge and cooperation over compliance and competition; (c) career development and marketability over syllabuses and marks; and (d) mindset and learning skills over competences and degrees (Kamat, 2012). Educators encourage instructional agility practices, particularly those based on Scrum, and believe that experimenting students with agile methods is an effective solution to qualify them for real job obstacles (Scott et

al., 2014). Collaborative and organizational processes of learning according to agile principles is known as instructional agility. It involves learners create content and develop skills in the same way as teachers in a technologically controlled, communicative and sustainable conditions (Royle & Nikolic, 2013). The teacher's position is based from an educated perspective on facilitation and project direction. The students become lifelong learners who are self-directed, team-oriented, and individually resilient. The agile learning approaches have evidently encouraged the creation of social management and organizational skills in students at the highest level (Noguera et al., 2018). Instructional agility is the competitive requirement of an organization, going to rely on various skills to respond quickly, and adapt to industry changes and the needs of customers such as competence of graduates (Noguera et al., 2018; Tse et al., 2016; Ramsay et al., 2019). Based on these arguments, the proposed hypothesis is:

H₅: The instructional agility is positively related to the performance.

2.6 The role of Instructional Agility in mediating the impacts of External Learning on Performance

By gaining knowledge about customers, competitors and regulators, can understand industry trends better and result in impressive performance (Slater & Narver, 1995). In addition, the knowledge obtained from external learning can evolve as ability of an organization (e.g. instructional agility), and then establish the greater performance of the organisation. For example, knowledge learning from customer (such as exchange information on product quality) has improved the performance of bottled drinking industries by strong partnership that are more receptive to customer needs (Ariadi et al., 2020). Thus, the following hypothesis is set as follow:

H_A: The instructional agility mediates the relationship between external learning and VHS performance.

2.7 The role of product innovation efficacy in mediating the impacts of External Learning on Performance

According to Koufteros & Marcoulides (2006), efforts attempt and external learning influences higher product innovation and improving operational speed and quality. Learning from partners and the ability to access previous experience are influenced not only by the types of partners but also by the knowledge transferred within an exploratory partnership (Hoang & Rothaermel, 2010). A collaborative partnership with industry is primarily aimed at translating cutting-edge technical developments into a new product or method. In general, this process involves the exchange of elaborate and tacit expertise-how among partners.

Mansury and Love (2008) identifies that the presence and extent of innovation in service has a positive effect on an organization's growth. Successful product innovation increases sales and market share, contributing significantly to existing customer satisfaction and new customer acquisition (Wang & Wei, 2005). Wright et al., (2005) finds that product innovation has a positive impact on performance in challenging situations. Thus, the following hypothesis is set as follow:

H_B: The product innovation efficacy mediates the relationship between external learning and VHS performance.

2.8 Conceptual Design

Based on the literature review, it is found that the external learning enhances the performance with instructional agility and product innovation efficacy as the mediating role. The proposed conceptual model is presented in Fig. 1.

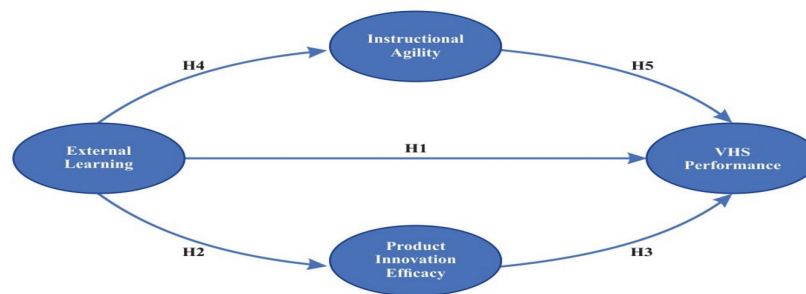


Fig. 1. Conceptual Model of the Study

3. Methodology

3.1 Data Collection and Sample

Data for the main study were received from the Vocational High School (VHS) in Bali Province, Indonesia. The sampling framework consisted vocational high school which are listed on Department of Education in Youth and Sports Bali Province. These schools are spread in 9 different regencies. The participating schools for this study were chosen using a simple random

sampling method. A random sample of 9 regencies was chosen, consisting of 175 Vocational High Schools, and this analysis was aimed at principals, and vice of principals who have authority to involve industry in curriculum plan and design, and the level to which the resulting curriculum meets the industry needs. In collecting the data, e-mailing questionnaire was distributed to gather the responses from Vocational High Schools. There are about 175 schools participating in this study. For this report, 129 usable answers were obtained from the manufacturing companies. The researchers faced some difficulties in collection the data including access barriers, principals related to their busy schedules, and incomplete responses, which decreased the response rate. Resulting data were gathered from 129 principals and vice of principals' combinations that represented 129 Vocational High Schools.

3.2 Instrument Development

Based on the literature review, the researcher has observed three variables (external learning, instructional agility, product innovation efficacy) contributing to performance. For example, respondents were requested to indicate the meaning of external learning to achieve their VHS performance, using a five-point scale with endpoints "Strongly disagree" (1) and "strongly agree" (5). External learning has been determined by six items that represent acquiring of product development knowledge from industry partners, acquiring of manufacturing process knowledge from industry partners, obtaining of market knowledge from industry partners, maintaining close communication with industry partners about quality product, maintaining close communication with industry partners about design changes, giving feedback on quality from industry partners (Hu, 2014; Hynes et al., 2011; Tse et al., 2016). Product innovation efficacy was measured by six items including curriculum product replacement phased out, extension of curriculum product range within main product field through new products/services, development of friendly curriculum products, developing new curriculum products with components and materials totally differing from the current ones, extension of curriculum product range outside main product field, increasing quality of current curriculum products in components and materials (Calisir et al., 2013; Plewa et al., 2015; Shashi et al., 2019). Instructional agility was measured by five items representing that are practicing strategy able to enhance the competencies of partners to respond to market demands, teaching strategy to be capable of responding to real market demand, focusing customized learning outcomes rather than standardized, increasing level of customization, joint planning with industry partners in learning process (Noguera et al., 2018; Plewa et al., 2015; Tse et al., 2016; Ramsay et al., 2019). VHS performance was measured by four items. They are graduate competencies, graduate employability, curriculum meets industry requires, learning outcomes (Noguera et al., 2018; Plewa et al., 2015). To deliver a deeper understanding of principal VHS, each VHS performance indicator listed above was measured on the VHS's major competitors over a span of three years. The questionnaire was based on previous studies with validated measurement scales in the present study which analyzed the constructs in a query.

4. Results

A statistical SmartPLS software package for PLS-SEM (Partial Least Square Structure Equation Modeling) data analysis was used to understand the direct and indirect effect of external learning on VHS Performance with mediating influence of instructional agility and product innovation efficacy at VHS in Bali Province, Indonesia.

4.1 Convergent Validity

The convergent validity of the test is usually determined by evaluating the loadings, the average extracted variance (AVE) and the composite reliability (Rahman et al., 2015). All loadings were higher than 0.708, the composite reliability was higher than 0.7 and the AVE of all constructs was higher than 0.5 as shown in the literature (see Table 1).

Table 1
Convergent Validity

Constructs	Items	Loadings Factor	Cronbach	Rho A	Composite Reliability	AVE
External Learning (EX)	EX1	0.945	0.974	0.975	0.979	0.887
	EX2	0.953				
	EX3	0.922				
	EX4	0.929				
	EX5	0.940				
	EX6	0.961				
Instructional Agility (IA)	IA1	0.966	0.972	0.973	0.978	0.900
	IA2	0.959				
	IA3	0.977				
	IA4	0.904				
	IA5	0.936				
Product Innovation Efficacy (PIE)	PIE1	0.913	0.964	0.964	0.971	0.846
	PIE2	0.931				
	PIE3	0.897				
	PIE4	0.925				
	PIE5	0.923				
	PIE6	0.927				
VHS Performance (VP)	VP1	0.932	0.944	0.950	0.960	0.857
	VP2	0.941				
	VP3	0.949				
	VP4	0.879				

Table 1 above exhibits that both Composite Reliability (0.7) and Convergent Validity techniques were used and shows that the Average Variance Extracted values (0.5) for both constructs are higher than the standard level. It supports the constructs' Composite Reliability and convergent validity.

4.2 Discriminant Validity

A latest suggested method was also used in the form of the Heterotrait-Monotrait correlation ratio to test the discriminant validity, and the findings are shown in Table 2. Unless the HTMT 0.90 reached the value of 0.90 (Gold et al., 2001), otherwise there is an issue with the validity discriminant. Since all the values are below the HTMT 0.90 (Gold et al., 2001) shown in Table 2 that the discriminant validity has been defined.

Table 2

Discriminant Validity (HTMT Ratio)

	EX	IA	PIE	VP
EX				
IA	0.613			
PIE	0.569	0.443		
VP	0.653	0.663	0.585	

4.3 Hypothesis Testing Results

The fit model was first tested prior to testing the hypothesis using two suitable parameters: Standardized Root Mean Square Residual (SRMR) and the Normed Fit Index (NFI). The SRMR is defined as the difference between the observed correlation and the model-implied association matrix, whereas values below 0.08 (Hu & Bentler, 1998) are recognized a good fit. Henseler et al. (2015) implemented the SRMR as a fit test for PLS-SEM which can be used to avoid model inaccuracies. The second fit index is a Normed Fit Index (NFI), an accumulative fit metric that measures the Chi-square value of the proposed model and links that value to a meaningful parameter (Bentler and Bonett, 1980). NFI values above 0.9 generally contain acceptable fit. The model's data fits are acceptable, since the SRMR value was 0.041 (< 0.08) and the NFI was 0.912 (> 0.90). The analysis shown in Table 3 describes standardized study model path coefficients (beta coefficients in which the findings are interpreted from a regression analysis). Table 3 and Figure 2 describe that the path coefficients from External Learning (EX) to VHS Performance (VP) was positive but non-significant (Standardized coefficient = 0.266; $p > 0.05$), the path coefficients from External Learning (EX) to Product Innovation Efficacy (PIE) was also positive and significant (Standardized coefficient = 0.553; $p < 0.01$). Thus, H1 is rejected but H2 is supported. The path coefficient from Product Innovation Efficacy to VHS Performance (VP) was positive and significant (Standardized coefficient = 0.257; $p < 0.01$), and the path coefficient from External Learning (EX) to Instructional Agility (IA) was positive and significant (Standardized coefficient = 0.598; $p < 0.01$). Therefore, there is enough evidence to support H3 and H4. The path coefficient from Instructional Agility to VHS Performance was positive and significant (Standardized coefficient = 0.367; $p < 0.01$) that the result supports H5. The indirect effects of External Learning (EX) on VHS Performance (VP) through Instructional Agility (IA) as full mediator was also positive and significant (indirect standardized coefficient = 0.220; $p < 0.01$; *Sobel Test* $Z=5.022$), that H_A is supported and full mediation. Then, the indirect effects of External Learning (EX) on VHS Performance (VP) through Product Innovation Efficacy (PIE) as full mediator was also positive and significant (indirect standardized coefficient = 0.142; $p < 0.01$; *Sobel Test* $Z=3.406$), that state H_B is supported and full mediation. Therefore, the results supported all hypothesis except H1 rejected.

Table 3

Results of the Hypothesis Testing

Hypothesis	Relationship	Standard Coefficients	Test Result
H_1	External Learning \rightarrow VHS Performance	0,266 **	Non-Significant
H_2	External Learning \rightarrow Product Innovation Efficacy	0,553 *	Significant
H_3	Product Innovation Efficacy \rightarrow VHS Performance	0,257 *	Significant
H_4	External Learning \rightarrow Instructional Agility	0,598 *	Significant
H_5	Instructional Agility \rightarrow VHS Performance	0,367 *	Significant
H_A	External Learning \rightarrow Instructional Agility \rightarrow VHS Performance	0,220 *	Significant
H_B	External Learning \rightarrow Product Innovation Efficacy \rightarrow VHS Performance	0,142 *	Significant

Note: * $p < 0,01$; ** $p > 0,05$

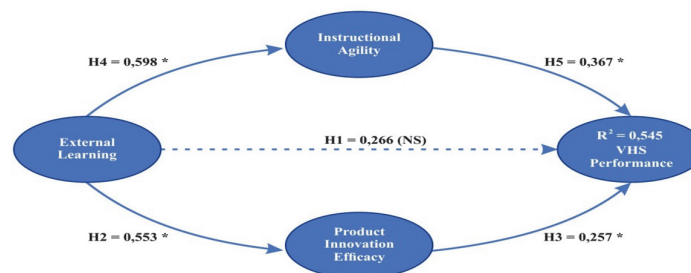


Fig. 2. Result of Path Analysis

Fig. 2 Displays the coefficient of determination (R^2) (the portion of the variance in the dependent variable which is predictable from the independent variable ranges from 0 to 1 the stronger). Values R^2 which are presented in Figure 2 show that the External Learning, Instructional Agility and Product Innovation Efficacy accounts for 54.5 percent of variance in VHS Performance.

5. Discussion

The findings from this study posit that the External Learning (EX) has not a significant influence on the performance of Vocational High School in Bali Province. Knowledge acquired by external learning from industry partners with joint problem-solving does not simply turn directly into organizational performance because of limited human resources and dynamic competencies work. The insignificant result of direct effect of external learning on performance, is consistent with the previous studies in the field (Hoang & Rothaermel, 2010; AlMulhim, 2020; Paladino et al., 2016; Tse et al., 2016). The results of this study confirm the findings of Calisir et al., (2013); Aragón-Correa et al., (2007); Jiménez-Jiménez & Sanz-Valle, (2011); Alegre & Chiva, (2008); Bierly & Daly, (2007); Wang & Ellinger, (2011) which reveals that implementing EX improves product innovation efficacy by acquiring of manufacturing process knowledge from industry partners. Learning from expertise and other institutions have become a vital necessity in organizations are challenged to become strategic business partners who can have an impact on learning and growth in order to increase product efficiency and enhance organization performance in a fast-changing market environment. Whereas product innovation efficacy has leveraged VHS performance that the present study is consistent with the findings of Aragón-Correa et al., (2007); Gunday et al., (2011); Shashi et al., (2019); Plewa et al., (2015). Product innovation efficacy such as curriculum meets business needs also acts as a primary catalyst for performance, which also serves as a bridge adding positive impacts to involve of businesses across different programs, courses and classes. A strong alignment of the curriculum with business requirements would reflect the reality business engagement on the board, making use of the strengths and perspectives of VHS and industry for the shared benefit of all concerned parties. Participating industry in VHS policy implementation not only provides insight into business needs, but also allows industries to influence learning and teaching strategies and policies across the VHS overall. Based from these arguments, product innovation efficacy bridges relationship between the external learning and VHS performance that fulfills the research gap. These results show that the instructional agility is a mediator between the external learning and VHS performance. The attempt to achieve the adequate understanding of intellect and wealth capabilities to integrate and address the real problems and knowledge provided to school education by the dynamic and ever-changing business sector (Gupta & Bharadwaj, 2013). Moreover, we argue that product development knowledge from industry partners and acquiring of manufacturing process knowledge from industry partners, are transferred to capacity (e.g. agility of learning). Thus, instructional agility is a joint planning with industry partners in learning process and teaching strategy to be capable of responding to real market demand, that will rely on specific skills to respond rapidly real market demand and will adjust to market changes and industry needs such as graduated competence (Noguera et al., 2018; Tse et al., 2016; Ramsay et al., 2019). Giving autonomy in learning will improve teacher performance that is a part of responding market demand through helps the principals for increasing VHS performance (Hartinah et al., 2020). For example, VHS may be able to acquire industry partners' expertise to respond to market needs through teachers should be able to build a learning atmosphere to provide students with industrial learning experiences (Wahyuni et al., 2020), which in turn may contribute to superior organizational performance such as graduates employability. Regarded from these arguments, the instructional agility bridges relationship between the external learning and VHS performance that fulfills the research gap.

6. Main Implications

Theoretically, this study supports the theory of knowledge-based view that extends an integrated model by improving new construct, which is the instructional agility. The instructional agility and product innovation efficacy is positioned as a mediator, this becomes the construct of the new model fulfils the research gap of the relationship between the external learning on VHS performance. The present study shows that the instructional agility has more impactful for indirect relationship between external learning and VHS performance rather than product innovation efficacy as mediator.

The research also has some substantial practical implications to principals of VHS when environments are becoming more dynamic as complexity levels, and change expand. Virtual High Schools can develop students, whom are already qualified with skills and capabilities not only for today's business issues but also for the business uncertainties of tomorrow. This research suggests that principals of VHS should acquire product development of knowledge, and get feedback from industry partners to achieve learning agility. For example, by engaging industry partners in curriculum design, principals can acquire knowledge externally; then that gain them allow to knowledge about the latest market need and partner competency. Instructional agility will enable VHS graduates to build successful organizations. It will enable the VHS graduates to contribute their competences for industry partners. They would be able to implement existing and potential strategic purpose efficiently, with the overall result being attained advantage and success. Whereas improvement of product innovation can be obtained by the acquisition of new knowledge, for example development of environment-friendly products based on industries need that encourages creative ideas and creative thinking within the organization.

7. Conclusions

The research findings have provided some significantly beneficial evidence of the importance of the instructional agility and product innovation efficacy as mediator in enhancing performance in VHS, Bali Province even though there is insignificant result between the external learning and performance. Thus, the study suggests that approaching of instructional agility has stronger influence than product innovation efficacy to achieve the performance.

The present study has limitations which indicate some future directions for research. This research applies a cross-sectional design, then a longitudinal study can be applied to the next research that will also contribute to analysing the effects of external learning on instructional agility and product innovation efficacy, which also improves performance. Lastly, the analysis is generated from vocational high school, and it is highly advantageous to collect data from other general high school to provide additional proof of outcomes.

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