Mediated-Moderation Model of Digital Education Competencies in Teaching and Learning System

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Students in today's Digital Education (DE) society are held to a higher standard of expectation and are expected to demonstrate greater levels of responsibility than their forefathers did while in school. Cognitive abilities (COA), process skills (PRS), systems skills (SYS), and social skills (SOS) are the four primary qualities of DE competencies. Therefore, we will look into the roles of COA, PRS, SYS, and SOS as the fundamental constructs required for compelling mastery of abilities in DE. This study employs a cross-sectional survey for data collection and analysis. The structural equation model (SEM) is used to define the relationship between the DE competencies. The sample consisted of 871 and 1,309 students in University of Muhammadiyah Purwokerto, Indonesia (UMP) and the University of Riau, Indonesia (UNRI). The findings revealed a significant interaction between COA and PRS, PRS and SYS. However, has no connection to COA and SOS. In a result, students who complete the DE competencies will be able to find solutions to any problems in the global challenges.

Keywords: cognitive abilities, process skills, social skills, systems skills

INTRODUCTION

Students must be equipped with the relevant abilities to participate in digital education (*DE*). It is no longer an optional criterion. Students in today's society are held to a higher standard of expectation, and they are expected to display more significant levels of responsibility than their forefathers did while they were in school. This skill is symptomatic of students' adaptability to new technological advancement (Pedro, 2019). Additionally, the potential to better oneself in DE should be considered a helpful trait that should be taken into consideration. It is because DE is a constantly evolving discipline. The explanation provided by Novita and Herman (2021) stated that the four primary qualities that constitute DE competencies are *cognitive abilities* (COA), *process skills* (PRS), *systems skills* (SYS), and *social skills* (SOS).

It has been determined according to the findings of previous studies (Krishna, 2020; Mellers et al., 2018; Paul, 2019; Schwartz, 2016). It is explained that COA, PRS, SYS, and SOS are the primary components in the attainment of students' abilities for DE to be successfully implemented. Therefore, the following research problem formulations will serve as the basis for the investigation, which will be conducted by looking at the position of COA, PRS, SYS, and SOS as the primary constructions for successful mastery of abilities in DE. Therefore, we will investigate the roles that COA, PRS, SYS, and SOS play as the fundamental constructs necessary for the compelling mastery of abilities in digital education. They are: 1) What exactly are the components of COA, PRS, and SOS on SYS in maximizing students' potential within the context of the educational field?; 2) What is the structural model of COA, PRS, SYS, and SOS in the context of mastering student capacities through digital education? and 3) Is it even remotely conceivable for the variables already present in the COA, PRS, SYS, and SOS components to provide a more holistic picture to accomplish the goal of mastering student capabilities within the context of digital education? Subsequently, in light of the problem definition, the following objectives of the study are 1) to investigate the COA, PRS, SYS, and SOS components for the successful mastery of students' abilities in DE; 2) to verify a structural model of the COA, PRS, SYS, and SOS components in mastering student abilities in DE; and 3) to provide a more holistic perspective in the pursuit of the successful mastery of students' abilities in DE.

LITERATURE REVIEW

Cognitive Abilities

According to Mashrah (2017), students need COA as their primary capacity to train and develop the functioning of the student's brain. It is because COA is a vital capacity that students need to possess. This line of thinking is consistent with another researcher's findings, who arrived at the same conclusion the first researcher did (Broekhuizen, 2016; Hawamdeh & Soykan, 2021). Therefore, it is possible to conclude students' COA based solely on the fact that they can think in the current scenario. The findings of Maharani (2018), which reveal that COA is the primary key to DE in the present day, explain the same thing previously claimed. Besides, for students to be successful in digital education, which places a premium on their COA, they need to think in a way that is both abstract and coherent when using the multiple learning tools and technological settings available to them. COA was shown to be the most significant component in determining a student's level of success in DE, as stated by Warner and Kaur (2017). According to Fadhlullah and Ahmad (2017), COA can be viewed from the perspective of the ability to think critically and creatively. This is because DE encourages students to engage in various activities that require them to think critically and creatively. With the capacity to think analytically, students must demonstrate a high level of creative thinking as one of the requirements for graduating from an educational facility of higher learning (Padget, 2017). A study conducted at the University of Corolla in the United States found that the students' levels of creative thought significantly influenced the amount of information they could acquire.

The realization of a student's COA must come first as a precondition before developing critical thinking, which is an additional challenge resulting from this precondition's presence. Luke (2016) defined critical thinking as the capacity to reason and the ability to see from various learning sources, both of which are essential. Critical thinking is defined as the capacity to maintain and the ability to see from a variety of learning sources. Critical thinking is a skill that one must have to be successful. According to Karakoc (2016) one of the essential aspects of critical thinking at the university level is the capability of transforming raw data into data with some significance. This comprises a range of various viewpoints that are gained via the interconnectedness of a variety of different multidisciplinary fields. These subjects include education, business and economics, and computer learning. This is in line with how he approaches thinking about other things. According to the outcomes of Changwong et al. (2018), it would appear that Columbia University students have developed their critical thinking abilities. These abilities include the capacity to organize various assignment tasks using mathematical function systems, business networking, and computer design. This might be seen as a continuation of the point that was brought up earlier in the discussion. The findings research enables the author to get a more in-depth understanding of the

significance of analytical thought in the modern era of digital technology as a consequence of the findings of this research, which was obtained as a result of the study conducted by Facione (2020). He discussed the sophisticated mental processes that students at the University of Cairo in Egypt use to search out solutions to difficulties that arise in DE, and he did so in detail.

Process Skills

The process of gaining an education through digital resources is not something every student in Indonesia can participate in (Sumarni et al., 2020). This presents a difficult obstacle. They struggle to overcome several challenges, including a disparity in their cognitive capacity and a lack of comprehension caused by their lack of understanding. When it comes to acquiring knowledge of digital material in a virtual environment, students face wholly unique problems. Students need to have a solid experience of the PRS, including technological pedagogical content knowledge (TPACK), to complete their education in technology (Naziri et al., 2019). Learning activities traditionally carried away from computer screens are increasingly being carried out online rather than in conventional classroom settings. According to Lisa (2020), a combined education in virtual and real systems calls for a greater level of TPACK knowledge on the part of the student. This is in contrast to the patterns of online learning that were prevalent during the epidemic that occurred the year prior (Alakrash & Razak, 2021). Fitri (2019), who presented the same point of view, stated that education in the digital era enables students to access learning resources whenever they choose, which is why they need to be proficient in TPACK. Fitri added that one of the benefits of receiving an education in today's digital era is that students can access various learning resources at any time convenient for them.

Social Skills

According to Al-Mashhadani and Al-Rawe (2018), the satisfaction of students' needs through the utilization of this one-touch finger system has two effects on students: first, students are obligated to maintain SOS to remain competitive, and second, students can pursue new opportunities in the business world. According to (Bishnoi, 2021), the world of digital technology provides students with brand-new opportunities to establish themselves in a range of new business areas. These opportunities can be found in the world of digital technology. These new business categories include highly similar professions, such as start-up analysts, content producers, graphic designers, social media influencers, and many others. These professions are grouped because they are quite similar to one another. According to Naismith et al. (2016), new business fields in the digital world still require entrepreneurial abilities; the reason for this is that every kind of business has its unique set of risks, benefits, and drawbacks. This theory supported the claim that new business fields in the digital world still require entrepreneurial abilities. This argument was put out to explain why new business categories in the digital era still demand entrepreneurial qualities (Graham, 2020). Therefore, in today's digital world, we believe it is necessary to equip students with SOS regarding entrepreneurial skills to compete in the real business world later. It is essential to educate students in this manner so that to be able to compete with one another once they reach the workforce successfully.

According to Bolat (2020), entrepreneurial skills can be categorized under social competencies. These SOS include coordinating with other students, emotional intelligence, negotiating, convincing, having a service orientation, and training and educating other students. Having these social abilities is essential for a variety of reasons. Students always looking for new opportunities and business ventures may also be more likely to succeed in their endeavors. Students consistently looking for novel chances and entrepreneurial endeavors may also possess a positive perspective on life (Sousa, 2018). In particular, educational research on entrepreneurial abilities can be found in Krishna (2020). According to the findings, there is a correlation between the use of technology in students' social contacts and increased entrepreneurial abilities. This correlation was found to exist when students used technology to communicate. Graham (2020) shared the same idea and highlighted those students could acquire entrepreneurial abilities through coursework. Graham said this was the case because students were required to complete assignments related to business economics.

Systems Skills

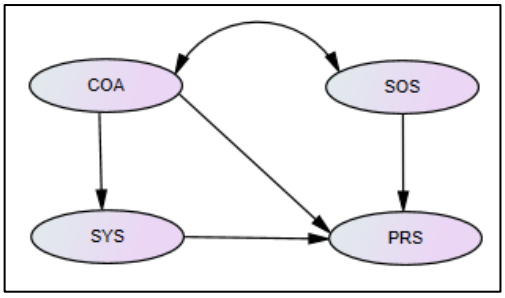
Research in Indonesia has not been able to provide evidence to back up this assumption (Silvia, 2018). Therefore, there is a need in education for a study emphasis that enhances students' entrepreneurial skills, most specifically in schooling during the digital age. This is a requirement that the rise of the internet has brought about. Besides, the capability to judge and make decisions as a method of perceiving a student's SYS is the third ability contributing to student success in DE today (Mellers et al., 2018). This skill is necessary for students' accomplishments in today's society. Through this capability, students are given a chance to consider students' beings as a component of the digital environment. Wilkins et al. (2020) concluded that one of the essential things in moving forward with students in the digital age is having the ability to make judgments and carefully consider which decisions would be the best. This was supposed to be one of the most critical factors. Students need to be able to make decisions fast while still giving them significant attention to succeed in today's digital environment. According to Mellers et al. (2018), One of these characteristics is the capacity to rapidly package data, depending on the analysis carried out in the past, to provide measurable facts in a manner that enables decision-making to be scientifically justified. It has been established that the SYS in the decision-making domain plays an essential role in the socialization of students in the digital environment (Schwartz, 2016). In this particular circumstance, interacting and looking for business opportunities in entrepreneurial skills (Ramalingam et al., 2018). As a consequence, we are in a position to draw the following conclusion: The ability to evaluate and select one course of action from a number of feasible alternatives is the deciding factor for the other four talents discussed earlier.

METHOD

Research Design

For data collection and analysis, this investigation uses a quantitative method and a survey with a cross-sectional design (Creswell, 2014). This tactic offers a more comprehensive explanation of the issue, which acts as the primary focus of the research (Chua, 2016). When gathering and analyzing data, using a quantitative technique, such as a cross-sectional survey, has its own set of advantages, which ultimately results in more reliable research (Creswell, 2014). The COA, PRS, SYS, and SOS are the components of this study. Some variables may be derived from each element. These variables include *judgment and decision-making* (JDM) for the purposing SOS, *critical thinking* (CRI) and *creative thinking* (CRE) for determining the COA, and *entrepreneurial skills* (ETR) for the SOS. Lastly, TPACK for determining the SYS. Those variables were designed as a questionnaire as the research instrument. Figure 1 expresses the interactions among the research components.

FIGURE 1
THE CONCEPTUAL OF INTERACTIONS AMONG THE COMPONENTS



By constructing an interaction model, which offers one the opportunity to do so, one can study how the four components, as mentioned above, interact with one another to accomplish the aims of DE. A structural equation model (SEM) is one of the models that can be used to investigate the interaction of more variables while preserving the same conditions. The SEM is a valuable tool for doing analyses such as this one. It is

possible to assess these competencies using the following four essential elements—COA, PRS, SYS, and SOS. In the future, SEM will investigate the correctness and consistency of the estimated values that come from the activities that students participate in within today's DE to determine whether or not these four components produce accurate and consistent results (Kline, 2017).

Population and Sample Respondents

Students from the University of Muhammadiyah Purwokerto, Indonesia (UMP) and the University of Riau, Indonesia (UNRI), volunteered to participate in this study, and their involvement was selected because they represent the demographic of interest for this study (Creswell, 2014). The sample included 871 and 1,309 students currently enrolled in both universities' faculty of education and economic business.

Data Analysis

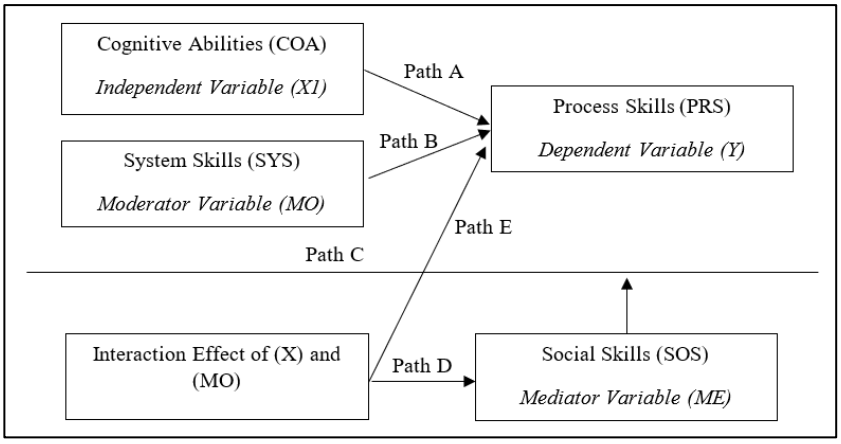
Structural Equation Model

We use the structural model to define the connection between the variables. There is a possibility that the relationship is not one of causality but rather one of correlation rather than influence (Byrne, 2019). This model is sometimes referred to as the entire model because it contains both the measurement model (factor analysis) and the confirmatory factor analysis model (Kline, 2017). In addition, we can determine the role that items play in measuring several different constructions. This model is more appealing than others because it is rather challenging to acquire model accuracy values that are sufficient due to the numerous factors that have the potential to generate faults in the model (Jackson, 2018).

Mediated-Moderation Model

The concept of mediated moderation refers to the combination of the variables of *moderation* (MO) and *mediation* (ME) (Igartua & Hayes, 2021). Based on the Bucy and Tao study (2019), the Mediated-Moderation example is depicted in Figure 2. In this case, the moderation variable, also known as size effects, needs to be established in the model first; hence, the focus of the research is typically on this aspect. Suppose there is a theoretical reason to believe that a fourth variable (DE competencies) acts as the mechanism or process that causes the relationship between COA and SYS. In that case, a search should be conducted to inject a mediated variable.

FIGURE 2
THE CONCEPTUAL OF INTERACTIONS AMONG THE COMPONENTS



The mediated moderation model assumes that the moderating effect can be produced by adding a ME variable as the fourth component. In this scenario, there is an interaction between *X* and MO, which influences ME (*Path D*), which in turn impacts *Y*. In addition, the variable that is ME also affects *Y* (*path E*). The model is therefore predominately based on a MO variable, while the ME plays a secondary role; in

the case of mediated moderation, all of the steps that Ali et al. (2018) took for mediating testing are repeated, but in this situation, the causal variable or *X* is the interaction.

Data Collection and Measurement

Adjustments are made to the GOF appropriateness in SEM based on the following categories: *the Chi-Square Statistics test*, *Adjusted Goodness of Fit Index* (AGFI), *Goodness of Fit Index* (GFI), and *Relative Mean Squared Error of Approximation* (RMSEA). A value of p-value greater than 0.05 indicates that the model is accurate. Then, the Incremental Fit, which consists of a good GFI and AGFI value greater than 0.90, suggests that the model created is appropriate and the maximum GFI or AGFI value is 1. Lastly, the Parsimonious Fit is defined as having a *Chi-square/df* value less than 3.0 (Kline, 2017). When the value of the RMSEA is less than 0.08, it is a sign that the model is near to satisfying the best model (Hair et al., 2014). In addition to validating the developed model, there is also the testing that determines whether or not the parameter is statistically significantly different from zero when compared at a significance level of 95%. SPSS-AMOS is the name of the computer software package that was utilized in this investigation to perform SEM (Byrne, 2019).

RESULT AND FINDINGS

Data Respondents

Students from UMP and UNRI made up the entirety of the study's sample population, which totaled 2.180 students and was composed entirely of students from those two universities. The proportion of students who identify as female makes up 11.11 percent of the whole student body, while the proportion of students who identify as male accounts for 88.89 percent of the total student population. A total of 2.180 students are still registered for classes; 1.030 of these students are enrolled in the fifth semester; 34.41 percent of the student body is written for the seventh semester; and 28.67 percent of the student body is registered for the third semester. If you look at the geographic distribution of the student population, you will see that 63.80 percent of students live in urban areas, while just 801 students reside in suburban areas. This information can be found by looking at the geographic distribution of the student population. This disparity can be explained by the fact that more students opt to reside in urban areas instead of rural communities. Two students have access to the internet for a period shorter than three hours per day. Whereas 865 students have access to the internet for a period between three and five hours per day; and 1.315 students have access to the internet for a period longer than five hours per day.

Structural Equation Model

The Cronbach Alpha reliability criteria can be applied as a criterion that can be used to determine the degree of dependability that the measurement model in question possesses. In addition to the requirements for determining the average variance, the requirements for determining the *Composite Reliability* (CR) must also be completed to arrive at the *Average Variance Extracted* (AVE). For the dependability rating to be calculated, the Cronbach Alpha value for each of the constructs must be more than 0.7 ($\alpha > 0.7$), the CR value must be 0.6 or greater than 0.6 ($CR > 0.6$), and the AVE value must be 0.5 or greater than 0.5 ($AVE > 0.5$). All of these requirements must be met. The following are the final decision values that were calculated for the CR values, the AVE values, and the Cronbach Alpha values after carrying out the CFA TPACK analysis.

The research determined that two components make up COA. There are five items on the CRE (IPPAKP4, 5, 6, 7, 8) and the same number on the CRI (IPPAKMI1, 3, 4, 5, 8). The SOS consists of four things (PAS 1, 3, 4, 5), but the SYS components have five. These are SAS 6, 7, 8, 9, and 10. As a result, the PRE has five sections, each of which has three items. The CK (PDIS 1, 2, 3), TCK (PSUP1, 2, 3), PCK (PAPP1, 2, 3), TPK (PPRE1, 2, 3), and the last for TPCK (PCON1, 2, 3). Subsequently, the data matched the model well, *Chi-square/df*=1.961, p =.000; CFI = 0.846, AGFI = 0.801, GFI = 0.827, TLI – 0.832, RMSEA = 0.059, after the elements with small coefficients (below 0.50) were eliminated. All of the other model variables have also been analyzed in the same way. Table 1 presents all of the information collected

regarding the final decision values of the CR, the AVE, and the Alpha Cronbach values of the research components.

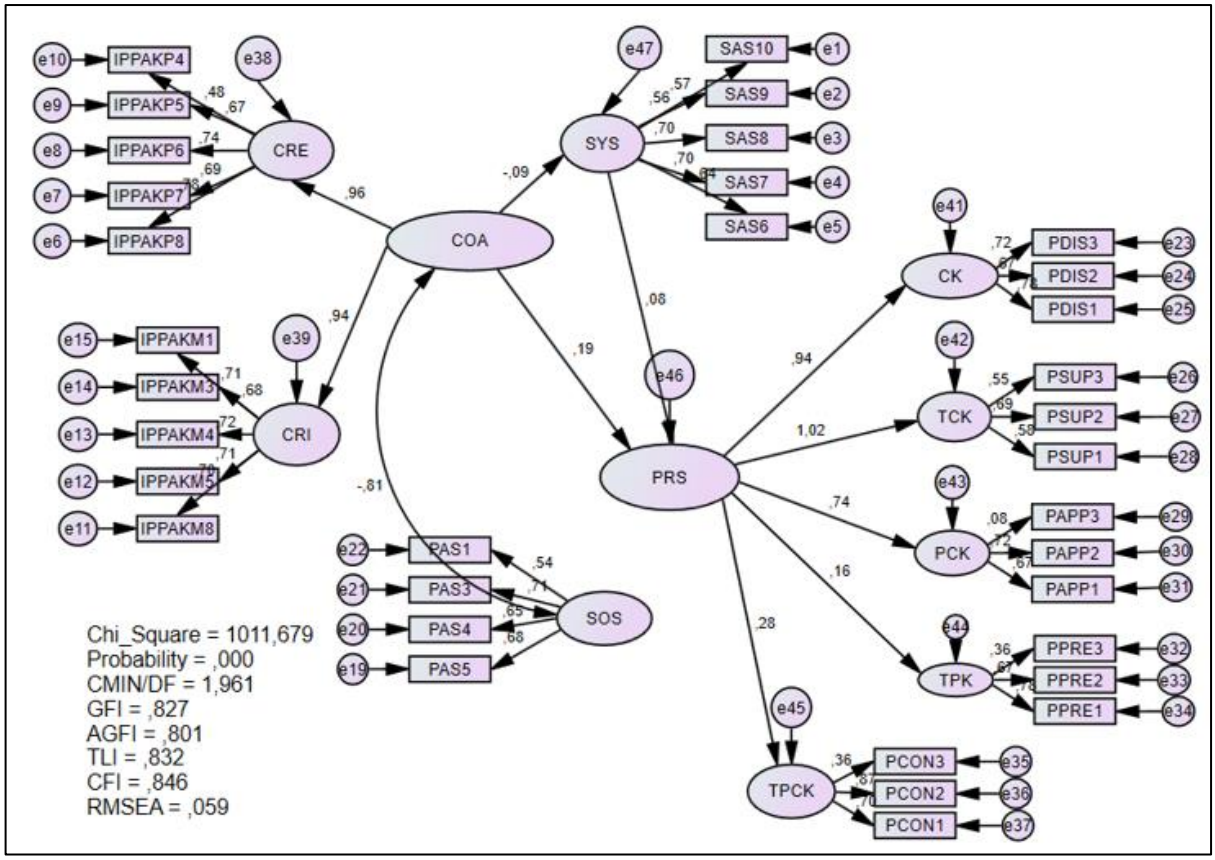
TABLE 1
THE DECISION VALUES OF CR, AVE, AND CRONBACH ALPHA

Components	Item	Factor loading	CR>0.6	AVE>0.5	Alpha Cronbach >0.70	Decision
Creative Thinking (CRE)	IPPAKP4	0.873	0.794	0.574	0.890	Achieved
	IPPAKP5	0.732				
	IPPAKP6	0.847				
	IPPAKP7	0.723				
	IPPAKP8	0.743				
Critical Thinking (CRI)	IPPAKM1	0.783	0.642	0.594	0.882	Achieved
	IPPAKM3	0.731				
	IPPAKM4	0.794				
	IPPAKM5	0.732				
	IPPAKM8	0.794				
Social Skills (SOS)	PAS1	0.732	0.642	0.544	0.891	Achieved
	PAS3	0.784				
	PAS4	0.748				
	PAS5	0.742				
System Skills	SAS6	0.732	0.788	0.592	0.744	Achieved
	SAS7	0.742				
	SAS8	0.794				
	SAS9	0.617				
	SAS10	0.725				
Content Knowledge (CK)	PDIS1	0.742	0.677	0.594	0.898	Achieved
	PDIS2	0.743				
	PDIS3	0.794				
Technological Content Knowledge (TCK)	PSUP1	0.742	0.682	0.699	0.794	Achieved
	PSUP2	0.794				
	PSUP3	0.742				
Pedagogical Content Knowledge (PCK)	PAPP1	0.774	0.699	0.682	0.744	Achieved
	PAPP2	0.742				
	PAPP3	0.694				
Technological Pedagogical Knowledge (TPK)	PPRE1	0.682	0.782	0.694	0.798	Achieved
	PPRE2	0.713				
	PPRE3	0.743				
Technological Pedagogical Content Knowledge (TPCK)	PCON1	0.737	0.732	0.690	0.794	Achieved
	PCON2	0.713				
	PCON3	0.724				

Based on the SEM model analysis findings, a second analysis was conducted to determine which of the SEM models was the most suitable. Furthermore, for the sake of this discussion, the worth of the interaction can be broken down into three stages: Stages of weak interactions are those with values less than 0.10, steps of simple interactions are those with values between 0.10 and 0.50, and sets of solid interactions are those with values larger than 0.50. Our results showed that the interaction between COA and PRS in moderate

strength (β = 0.19, moderate interaction), COA ↔ SOS (β = - 0.81, ns), and SYS → PRS (β = 0.08, weak interaction). Based on the results of the SEM analysis, we can conclude that only the COA correlation to SOS is statistically insignificant. The SEM model of DE competencies used in this analysis is shown in Figure 3.

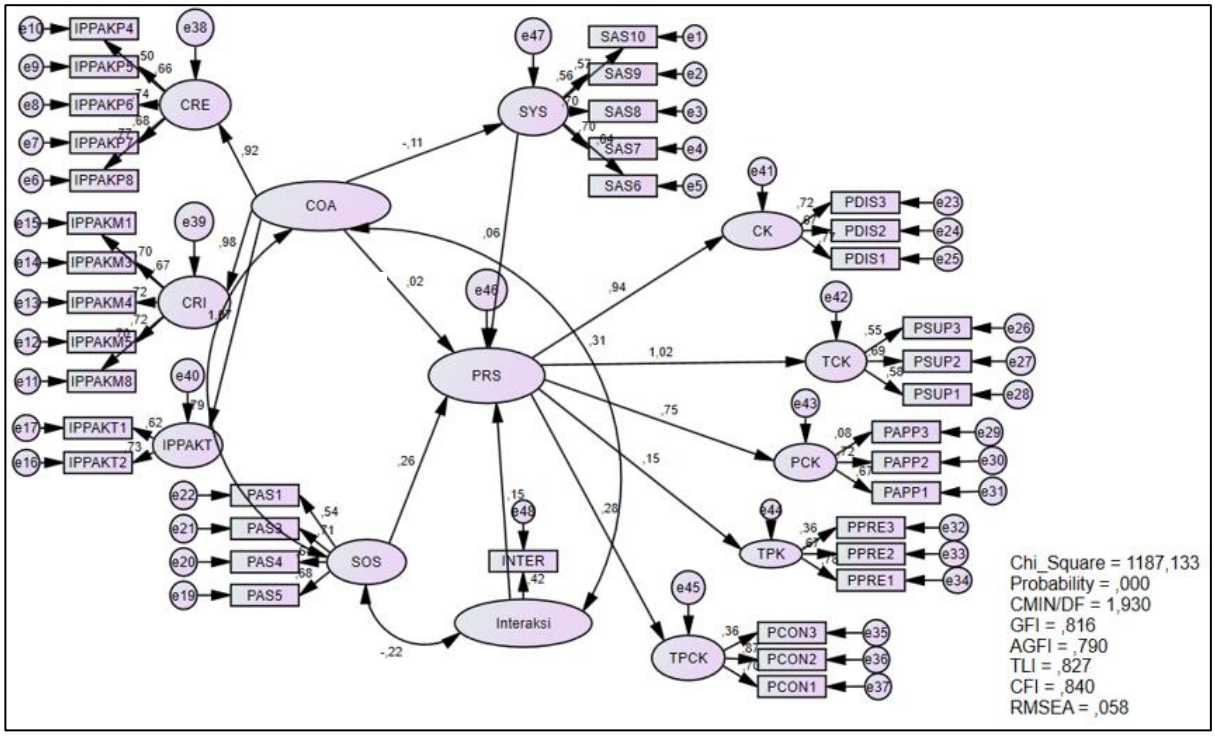
FIGURE 3
THE DE COMPETENCIES MODEL



Mediated-Moderator Model

To begin, we put time pressure to the test during the middle phase of the mediation and then switched it to the beginning of the process to see how the parties would react to the increased COA. Model 1 at PRS; acceptable fit, *chi-square/df* = 1.930, GFI = 0.816, AGFI = 0.790, TLI = 0.827, CFI = 0.840, RMSEA = 0.058. Similar to the previous models, the interaction effect was only significant during the second half of the mediation. COA to PRS (β = 0.02); SYS to PRS (β = -0.11, ns); SYS to PRS (β = 0.06), SOS to PRS (β = 0.26). The Mediated-Moderator Model analysis (figure 4) led us to conclude that only the SYS association to PRS is insignificant.

FIGURE 4
THE MEDIATED-MODERATOR MODEL



DISCUSSION

Study findings revealed a substantial but weakly correlated interaction between COA and PRS. And the reason for that is one way to improve a student's COA accomplishment is to provide that student with instruction in PRS (Ilma et al., 2020). This can be accomplished by providing that student with education. It was further explained by Yamtinah et al. (2017) that learning PRS is used to assist students in gaining an understanding of the material that is more long-term memory. Therefore, it is anticipated to be able to solve all forms of problems that may arise in daily life, particularly in the face of global challenges. The students' COA has a significant connection to the PRS they are working. The students need to have this information readily available to them. Studies have shown a significant association between students' knowledge of learning concepts and their competency in the learning procedure (Syafiq et al., 2022). Students' engagement in learning activities that promote PRS, such as practical exercises, contributes to an increase in those students' overall comprehension, which in turn enhances students' COA (Fadhlullah & Ahmad, 2017). Specifically, teachers were concerned that students who did not acquire COA would be unable to collect proper proof to answer questions. Therefore, educational activities that put students to work on real-world problems could assist students' achievements in COA and PRS. Yamtinah et al. (2017), explain why it is essential for students to develop their COA and PRS by utilizing a variety of learning methodologies. Specifically, we focus on the importance of students developing their ability to integrate their knowledge of learning concepts. Ilma et al. (2020), added that the inquiry strategy improved students' PRS and concept understanding because students were free to make observations, experiment planning, and the concept of implementation. This contributed to the inquiry strategy's success in improving students' COA and concept understanding. It was a contributing factor to the success of the inquiry technique in enhancing students' PRS as well as their COA.

Meanwhile, this study's findings also reveal the significance between the students' PRS possessed by students' SYS. In addition, the SYS indication was the sole indicator of this type of skill that was given an

acceptable rating in the stages of the examination (Daraee et al., 2018). Students can receive training in the PRS for the learning method. These skills can be taught to students using a variety of SYS: methodologies, media, and assessment tools. Students also get the opportunity to receive instruction in the PRS necessary for carrying out learning processes (Himmetoglu et al., 2021).

Teachers should, for instance, instruct students to constantly think in a learning manner and provide students with activities on PRS so that students can practice utilizing such skills (Selimović et al., 2018). According to Tadjer et al. (2018), the inquiry approach was an effective learning method that could promote PRS, and SYS. Inquiry-based learning is the strategy that has proven to be the most effective in assisting students in acquiring a deeper understanding of the PRS used in SYS. It is recommended that teachers carry out this stage for them to be able to predict significant progress in the capabilities of their students after they have practiced several different experiments.

A large study has been carried out during the past few decades on the SYS connected to PRS. Ibrahim and Wekke (2019) worked together on one of these investigations. They investigated the process of developing PRS as well as the use of SYS in ED learning. The findings of this study imply that professional development opportunities should be made available for teachers through either the public sector or private educational institutions. For instance, the ramifications of these findings suggest that educational institutions should hold seminars to boost teachers' learning method comprehension abilities. While, Voogt et al. (2020) the current state of learning process skills. Also, they aimed to determine the current situation in terms of the impediments that are currently in place. This study concluded that the best support came from teachers' confidence to teach learning PRS in the classroom. In contrast, timing presented a substantial challenge to implementing SYS at the school.

On the other hand, changes and improvements in education need to co-occur with advancements that are being made in technology, just like they do in any other field of study. This is essential to ensure that students receive the best possible education (Hasanah & Shimizu, 2020). Oral argues that SYS can influence PRS and the advancement of COA in education, which is an essential topic to consider due to their argument. Also, Amri and Ekaningsih (2019), SYS is among the characteristics of this spectrum of factors that is one of the most significant components. SYS is a tool that is not only extraordinarily beneficial but also very required in the field of education, just as it is in all other areas of PRS and COA (Darmaji, 2021). The education industry is undergoing fast alterations at a rate never seen before. Students living in today's world are not capable of memorizing these facts, and doing so is also not required in today's information societies, characterized by continuous change and the advancement of knowledge. Students who live in communities based on the information are expected to be able to obtain access to information, put the COA they currently have to use, and develop PRS on their own (Maison et al., 2019).

Subsequently, combining SYS and COA in technological capabilities with tried-and-true teaching methods is one approach to overcoming the PRS problems. When this is done, the SYS of teaching and learning can become more fruitful, and as a result, students can obtain more extensive instruction (Sunyono, 2018). It is of the utmost importance to emphasize that SYS has developed into a requirement in education. This is the case despite SYS not being a magic bullet that can fix all of the problems plaguing the educational system. To make the most of the opportunities made available by incorporating COA into the classroom, PRS for experienced teachers is an imperative necessity (Kurniawati, 2021). It has become abundantly clear that the establishment of educational institutions would benefit immensely from using SYS. Because of this, it is indispensable for teachers to integrate SYS into both the PRS settings in which they operate and the COA in which they teach (Wisnu et al., 2021).

According to Stichter et al. (2017), in this information age, when access to all information in the world is at one's fingertips, the inability to use SYS amounts to a deliberate avoidance of COA. On the other hand, Amri and Ekaningsih (2019), if one wants to pursue a career in education, it is essential to have prior experience working with computers. Several schools demand that their teachers meet this condition, which states they must possess a particular set of abilities. Teachers are required to demonstrate that they can utilize computers for PRS purposes and that they are proficient in using computers in COA (Kurniawati, 2021).

On the other hand, the process of mutual SOS contact can be segmented into COA stages for it to be completed successfully. The investigation of Spence (2020) strongly emphasized these aspects of the topic. It is essential to clarify that the COA will be evaluated with SOS. These activities are what make it possible for us to attain the objectives that we want to achieve, and they are what we should focus on doing. Therefore, the development of SOS is done with specific goals in COA. In this way, Zsolnai (2018), having competent SOS is based on the proper application (in terms of context) of the techniques of appropriate and effective SOS with other students. The fact that the various aspects of COA competence come together to form distinct social units brings us to differentiating features of SOS. A student with SOS can adapt their behavior to fit the context in which they find themselves using a variety of appropriate COA for the situation. The student's performance in their behaviors offers a basis for concluding that the student exhibits SOS talents (Soto-icaza et al., 2018). This is one of the most evident symptoms that a student is outstanding in SOS, and it is also one of the most significant COA they possess. It is possible to teach students the necessary SOS through COA instruction.

The component of SOS is students' capacity to exert COA control over their social gifts (Budyartati, 2019). This refers to students' ability to discuss with other students. Therefore, a student with poor SOS might have mastered the fundamentals of COA but might not have the SOS processes necessary to employ these fundamentals in their relationships with other students. A student with poor SOS is likelier to engage in risky and unhealthy behaviors in COA situations. A student lacking in SOS has a greater propensity to have fewer good relationships with COA (Erdley & Holleb, 2019).

CONCLUSION

The study revealed that the preceding variables have a significant impact on the research's design and conceptual theories, allowing it to develop a new theory or change the direction of previous theories. Furthermore, the inclusion of these variables and their combination opens up new avenues and abundant insights into business research and provides a solid foundation for analyzing the interaction effects of moderating and mediating variables. This function also makes designated models more comprehensive and relevant to reality, allowing researchers to solve real-world business problems and arrive at more satisfactory and complete solutions. The findings are generally consistent with education and business mediated and moderating literature. Finally, this paper focused solely on providing a conceptual analysis in this domain; empirical works in this field can unambiguously operationalize the conceptual of DE competencies model and the effects of the mediated and moderating variables, revealing the contributions of this article more clearly. Furthermore, this paper only focused on the structural model and the mediated moderating model in their interactions. The effects of "control" variables as well as "extraneous variables" can be studied alongside moderating and mediating variables.

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