

Exploring the Impact of Proactive Personality on Social Capital through Internet Self-Efficacy and Online Interaction Quality

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Abstract. During the COVID-19 crisis, traditional learning has suddenly turned into digital learning, which ultimately poses challenges for students and teachers. During the COVID-19 pandemic, the influence of personality factors on students' social networks appears to be a neglected area of research. In this study, we aimed to explore the relationship between proactive personality and social capital through underlying mechanisms (such as internet self-efficacy and online interaction quality), particularly to obtain data during the peak of the COVID-19 pandemic. In addition, this study also aims to examine the moderating role of perceived social support in the relationship between proactive personality and internet self-efficacy and the relationship between proactive personality and online interaction quality. Similarly, the moderating effect of perceived social support also investigated the mediating effect of Internet self-efficacy & online interaction quality. This study used a survey tool to collect data from 332 respondents, including students and teachers from Wonosobo, an area in Central Java. In this study, we found that students' proactive personalities strengthened their social capital through the quality of online interactions during the COVID-19 pandemic. Similarly, perceived social support amplifies the mediating effect of online interaction quality in the relationship between proactive personality and social capital during the COVID-19 pandemic. Furthermore, the implications and directions of future research are also discussed.

Key words: Effect of the COVID 19 Pandemic; Digitalization of Higher Education; Proactive Personality; Social Capital; Internet Self-Efficacy

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INTRODUCTION

The Corona Virus (COVID-19) was declared a pandemic by the World Health Organization on March 11, 2020 (Cucinotta & Vanelli, 2020). As a result, many countries around the world are instructing their citizens to stay at home, avoid very close physical contact, and take social or physical distancing measures. Similar instructions were issued to all educational institutions and these institutions were ordered to organize online classes.

Therefore, virtual learning becomes the only option for students and teachers to communicate with each other. The COVID-19 pandemic also has an impact on the personality and mental health of students (Bao et al., 2020). In a recent survey, it was reported that during the COVID-19 crisis, 8.1% of the general population in China was under moderate to severe stress (Guan, et al., 2020). Some experts have found that the intensity of stress can vary from person to person, depending on their personality characteristics (Linn & Zeppa, 1984). Personality is one of the factors that influence the assessment and stress response.

Particularly in pandemic situations, different

personality traits (such as proactiveness, conscientiousness, and extroversion) are closely related to stress (Afshar, et al., 2015). Students are greatly affected by this pandemic in different ways; on the one hand the pandemic is life-threatening, on the other hand the closure of educational institutions disrupts their studies. In these difficult times, virtual learning platforms have been encouraged by educational institutions around the world. In developed countries, virtual learning is considered a very effective alternative to traditional learning (Sife, Lwoga, & Sanga, 2007).

In developing countries, digital learning remains a challenge due to the limited coverage of Internet services and related technologies. Many scholars have conducted investigations and pointed out the poor Internet infrastructure, acceptance of smartphones in education (Jurkovic, 2019), and inhospitable digital classroom environment (Cao, Khan, & Khan, 2019) during the COVID-19 pandemic. In the context of a pandemic, there is little literature to examine the impact of personality factors on social capital in virtual settings. In this study, we try to bridge the academic gap by studying the

underlying mechanisms influencing the relationship between proactive personality and student social capital, especially in the COVID-19 crisis.

Social capital is an emerging concept in the digital education literature, which provides the basis for describing various relationships in social networks (Rice, et al., 2020). Social capital refers to the relationship between parents and children, and this relationship can drive their children's academic success. Many scholars have studied different personality traits and social networks and found that personalities make up social networks. For example, openness and extroversion were significantly related to instrumental social capital, while agreeableness and extroversion were significantly related to expressive social capital (Tulin, Lancee, & Volker, 2018). In the online learning experience, a significant focus is not only on the formation of social capital but also on determining the role of personality traits in the formation of social capital. In challenging situations (such as COVID-19), people with strong personalities are in a better position to deal with stress and challenges. People with proactive personalities show initiative, seek opportunities, take action instead of waiting and reacting, and persist until change is achieved. Similarly, proactiveness is an influencing factor that affects students' proactive learning behavior in uncertain circumstances (Kim & Park, 2017). Students with proactive personalities are believed to be able to adopt digital fashion in college by forming online learning communities and social networks (Spitzmuller, Sin, Howe, & Fatimah, 2015). Experts believe that personality factors have an important impact on online education, and also express different views when describing

personality traits and online learning tools. The COVID-19 pandemic has sparked the need for further investigation to explore potential mechanisms (such as internet self-efficacy and online interaction quality) that could link proactive personality to social capital in digital higher education. Several previous studies have argued that the impact of internet self-efficacy is significant on student participation in online learning (Zhu, Kuang, Kennedy, & Mok, 2018).

Self-efficacy can help students interact online and are expected to succeed in exams. On the other hand, the impact of online interaction quality on social capital and found that online interaction quality significantly affects social capital gains. However, the impact of proactive personality on social capital is indirect (Wellman, Haase, Witte, & Hampton, 2001).

Therefore, the first objective of this study was to explore the direct influence of students' proactive personality and social capital as well as the indirect influence through indirect self-efficacy and online interaction quality. The second objective was to examine the effect of perceived social support contingent on the influence of active personality on Internet self-efficacy and online interaction quality. The third objective was to explore the moderating effect of perceived social support on mediators (network self-efficacy and online interaction quality) in the relationship between positive personality and social capital (see figure 1). Perceived social support from peers and teachers has encouraged proactive students to benefit from social capital through online interactions. Perceived social support positively influences personality traits that help strengthen psychological well-being in challenging situations (such as the COVID-19 pandemic) (Major, et al., 1990).

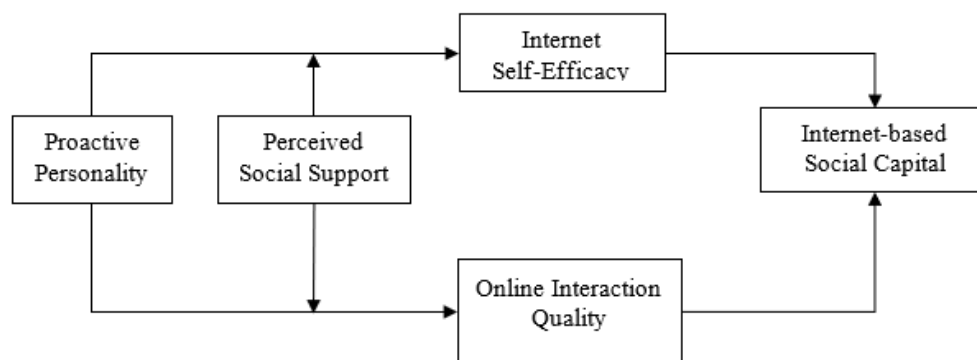


Figure 1. Hypothetical Study Model (Zheng, Khan, & Hussain, 2020)

METHODS

1. Data Collection Procedure

The sample of this research includes students and students in various fields in Wonosobo. In the COVID-19 pandemic, Wonosobo was chosen as the location of this study because it is included in the geographical area studied. The survey was conducted during the peak period of the COVID-19 pandemic from April 2020 to July 2020. During the COVID-19 pandemic, it was difficult to have physical contact with students, so we collected data from online participant surveys.

For this purpose, we designed a questionnaire using a software called google docs. Prior to distributing the questionnaire online, we recruited student volunteers. Most of the volunteers were also members of different social media groups formed by homeroom teachers. This social media group is not an official group. The purpose of these groups is to share class information, course materials, class updates, and maintain regular contact with students. Teachers use different social media platforms (such as Facebook, WhatsApp, Zoom) to form online groups for educational activities. With the group administrator's permission, we use these groups which are formed on various social media platforms and sent links to online questionnaires for students through our student volunteers. The

online questionnaire was developed in English, and respondents' responses were measured using a five-point Likert scale (ranging from 1 'strongly disagree to 5' strongly agree).

In this study, we used a time lag approach (Salkind, 2010), where data were collected in two time waves, and the time interval between the two waves was two months. In the first wave of data collection, questionnaires were sent to 510, and 372 student responses were received. In the first wave, data on proactive personality, internet self-efficacy, perceived social support, and demographics were obtained from students. Two months later, we collected data for the second wave of surveys. We collected data from students who recorded their responses in the first wave survey. We collected data on online media, interaction quality of students and matched data on social capital of each teacher. In the second round of data collection, 172 students and 164 teachers recorded their responses, and a total of 336 matching responses were received. After deleting missing and unmatched answers, the final sample was 332 respondents. The response rate is around 65%, most of the respondents are women (67%), and most of the respondents (37.5%) are between 21-25 years old.

Table 1. Demographics Data

Variable	N	Percentage	Variables	N	Percentage
Gender			Qualification		
Female	223	67.27	Under Graduate	69	20.78
Male	109	32.83	Graduate	97	29.22
Age			Postgraduate	166	50.00
Up to 20	6	01.81			
Up to 21-25	124	37.35			
Up to 26-31	97	29.22			
Above 31	105	31.62			

2. Measurement

2.1 Proactive personality: In this study, we used a shortened version of the self-reported, 10 item proactive personality scale to measure active personality (Seibert, Crant, & Kraimer, 1999). Considering the context of the COVID-19 pandemic, we have made slight changes to the statements of each item of this scale. The sample is '*Despite the COVID-19 Pandemic, I excel at identifying opportunities*'.

2.2 Internet self-efficacy: To measure self-efficacy, we used seven follow-up items. The internet self-efficacy scale (Kao, Wu, & Tsai, 2011). Sophisticated Internet self-efficacy can

meet the educational and social needs of users associated with Internet use. The sample item is "I feel confident to talk to other people one-on-one in online chat rooms."

2.3 Quality of Online Interaction: To measure the quality of online interaction, we used the 12 item Cognitive Presence Scale (Arbaugh, et al., 2008). In the context of the COVID-19 Pandemic, we made minor changes to the scale items. An example of an item is "During the COVID-19 crisis, online interactions with classmates provided me with multiple sources of information to explore the issues raised in this course".

2.4 Perceived social support: To measure perceived social support, we used six items: the

scale (Vayre & Vonthron, 2017). This scale emphasizes support from classmates, teachers and family members. The scale items were slightly modified in the context of the COVID-19 pandemic. The sample item is "During the COVID-19 crisis, I get the help and emotional support I need from my family."

2.5 Internet-based social capital: To measure Internet-based social capital, we use a ten-item scale (Ellison, Steinfield, & Lampe, 2011). In this scale, the teacher assesses the appropriate student social capital. In the context of the COVID-19 pandemic, this scale has changed slightly. The sample item is "Despite using social distancing measures, students are skilled in collaborating with other students to diagnose and solve learning problems."

3. Hypothesis

H1: Proactive personality increases internet self-efficacy

H2: Proactive personality increases online interaction quality

H3: Internet self-efficacy mediates the association between proactive personality and social capital

H4: Online interaction quality mediates the association between proactive personality and social capital

H5: Perceived social support moderates the association between proactive personality and internet self-efficacy in this way that this

association becomes stronger by increasing perceived social support and vice versa.

H6: Perceived social support moderates the association between proactive personality and online interaction quality in this way that this association becomes stronger by increasing perceived social support and vice versa.

H7: Perceived social support moderates the mediating effect of internet self-efficacy in the association between proactive personality and social capital in this way that this mediating effect becomes stronger by increasing perceived social support and vice versa.

H8: Perceived social support moderates the mediating effect of online interaction quality in the association between proactive personality and social capital in this way that this mediating effect becomes stronger by increasing perceived social support and vice versa.

RESULTS AND DISCUSSION

First, the study calculated the reliability, mean, and standard deviation of each scale and Cronbach's alpha, as shown in Table 2. If the correlation coefficient in the regression analysis is usually above 0.70, the probability of multicollinearity increases (Tabachnick & Fidell, 1996). The results of the current study indicate that the correlation coefficient is lower than the standard benchmark, which means that all current measures can be included in the research analysis.

Table 2. Descriptive Statistics, Alpha, and Correlation Matrix

Construct	Mean	SD	SC	ISE	PP	OIQ	PSS
SC	3.39	0.94	(0.97)				
ISE	3.48	1.06	0.405**	(0.96)			
PP	3.59	0.93	0.318**	0.392**	(0.97)		
OIQ	3.69	1.06	0.512**	0.469**	0.508**	(0.90)	
PSS	3.65	1.10	0.439**	0.122**	0.036**	0.149*	(0.93)

Note (1) SC = Social Capital, ISE= Internet Self Efficacy, PP= Proactive Personality, IOIQ= Online Interaction Quality, PSS= Perceived Social Support, (2) Correlation is significant at the 0.01 level (3) Cronbach α values appear in parentheses on the diagonal.

1. Measurement Model

In the time lag method, the data come from different periods and different respondents, thereby reducing the bias of the general method (Podsakoff, MacKenzie, & Lee, 2003). In this study, we collected data in two time waves, so there is no serious problem of bias of the general method. In addition, we performed a series of confirmatory factor analysis (CFA) tests on the data set using statistical solutions to reduce the risk of general method bias, and we also

calculated fit to understand the fit model in our data set (Hair, Black, Babin, Anderson, & Tatham, 2009).

To calculate a good model fit, the value of χ^2/df must be less than 2.5, the comparative fit index (CFI) and the Tuck-Lewis index (TLI) must be greater than 0.9. Furthermore, to obtain a good model fit, the root mean square error of the approximation (RMSEA) must be less than 0.08 (Hu & Bentler, 1998). In the full-model CFA test, all items are loaded with their latent factors

(Anderson & Gerbing, 1988). As shown in Table 3, the psychometric characteristics of the measurement model are good. To test for general method bias, we used single factor test to consider CFA, in which all study variables were allowed to load into one factor, so the research model showed a lack of fit. According to the single factor results, there was no significant difference in the data of this study (Alfes, Shantz, Truss, & Soane, 2013). The novelty of the research

variables was tested by applying a series of nested model comparisons. This study compares the full measurement of all latent variables with a range of alternative models as shown in Table 3. The results of the difference test show that the five different variables mentioned in the research model make the model more reasonable than the other models. Therefore, these results provide concrete evidence that the research model with these five variables is different and appropriate.

Table 3. Results of Confirmatory Factor Analysis

Models	χ^2 (df)	χ^2_{diff} (df _{diff})	χ^2/df	TLI	CFI	RMSEA
Five Factors Model	2523 (960)	-	2.63	0.930	0.935	0.069
Four Factors Model 1 PP and ISE combined	5622 (964)	3099 (4***)	5.83	0.774	0.806	0.12
Four Factors Model 2 PP and OIQ combined	6054 (964)	3531 (4***)	6.28	0.773	0.787	0.13
Three Factors Model PP, OIQ and ISE combined	7873 (967)	5350 (7***)	8.14	0.692	0.711	0.15
Two Factors Model PP, PSS, OIQ and ISE combined	8672 (969)	6149 (9***)	8.94	0.656	0.678	0.16
Single Factor Model	11219 (970)	8696 (10***)	11.57	0.543	0.572	0.18

Note: ISE= Internet Self Efficacy, PP= Proactive Personality, OIQ= Online Interaction Quality, PSS= Perceived Social Support; TLI Tucker-Lewis index; CFI Comparative fit index; RMSEA Root-mean-square error of approximation.

2. Hypothesis Testing

This study uses hierarchical multiple regression to test the hypothesis from H1 to H4. Meanwhile, hierarchical moderation regression was used to test the hypothesis from H5 to H8. To test moderated mediation, this study followed the steps recommended (Preacher, Rucker, & Hayes, 2007). To perform the interaction test, the independent variable (eg proactive personality) was standardized in all analyzes while the dependent variable (eg social capital) was not

standardized to reduce the possibility of multicollinearity that might affect study results (Aiken & West, 1991).

To examine the effect of mediation, this study used the approach of (Baron & Kenny, 1986). The study results showed that there was an insignificant relationship between proactive personality and Internet self-efficacy ($\beta = .39$, $p .001$, Model 1, Table 4), and between proactive personality and online interaction quality ($\beta = .50$, $p .001$, Model 1, Table 5). Thus H1 and H2 are

accepted. From the perspective of the above relationship between proactive personality and mediating conditions, there is a significant social capital as shown in Column M4 of Table 4.

Table 4. Mediating role of Internet Self-Efficacy and Moderating Role of Perceived Social Support

Predictors	Dependent Variables					
	Internet Self-Efficacy			Social Capital		
	M1	M2	M3	M4	M5	M6
Age	0.09	0.10	0.11	0.06	0.01	0.02
Gender	0.04	0.02	0.01	0.07	0.06	0.05
Education	-0.1	0.01	0.02	-0.10	-0.11	-0.12
Experience	0.10	0.11	0.12*	0.01	-0.05	-0.06
Proactive Personality (PP)	0.39***	0.38***	0.37***	0.31***		0.18***
Perceived Social Support (PSS)		0.11*	0.13**			
PP x PSS			0.11			
Internet Sel Efficacy					0.41***	0.34***
R2	0.18***	0.19*	0.20	0.16***	0.22***	0.25***
Δ R2	0.18***	0.01*	0.01	0.16***	0.06***	0.03***
F	59.24***	4.75*	3.94	12.28***	19.07***	40.76***

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

The first condition of (Baron & Kenny, 1986) approach is met. There is a significant relationship between internet self-efficacy and social capital as shown in M5 in Table 4 and also a significant relationship between online interaction quality and social capital as shown in M5 in Table 5. Three mediation conditions have been met. In the final condition, when we included independent variables along with mediators such as internet self-efficacy and

online interaction into the model simultaneously, the independent variables such as proactive personality remained significant as shown in M6 of Table 4, which means that H3 is not supported, while the variable H3 is not supported. independent personality such as proactive personality becomes insignificant as shown in M6 Table 5 which means that there is a quality of online interaction that has mediation. Thus, H4 is supported.

Table 5. Mediating role of Online Interaction Quality and Moderating Role of Perceived Social Support

Predictors	Dependent Variables					
	Online Interaction Quality			Social Capital		
	M1	M2	M3	M4	M5	M6
Age	0.01	0.01	0.02	0.10	0.10	0.10
Gender	-0.01	-0.03	-0.04	-0.06	-0.04	-0.05
Education	-0.11	-0.10	-0.11	-0.11	-0.06	-0.07
Experience	0.03	0.02	0.04	-0.10	-0.12	-0.12
Proactive Personality (PP)	0.50***	0.51***	0.45***	0.13***		0.01
Perceived Social Support (PSS)		0.12*	0.17**			
PP x PSS			0.38***			

Omlime					0.28***	0.29***
Interaction						
Quality						
R2	0.27***	0.28*	0.43***	0.05*	0.11***	0.12***
Δ R2	0.27***	0.01*	0.15***	0.05*	0.11***	0.07***
F	24.91***	5.85*	78.69***	2.84*	6.869***	19.025***

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

3. Moderation Analysis

To analyze the moderating impact of perceived social support on the relationship between proactive personality and internet self-efficacy, M3 results from Table 4 show that the interaction between proactive personality and perceived social support on internet self-efficacy is not significant. Thus, H5 is supported.

On the other hand, the interaction of perceived social support on the relationship between

proactive personality and online interaction quality is shown in M3 Table 5. The results show that this perceived social support interaction is significant with online interaction quality. This means that perceived social support moderates the relationship between proactive personality and online interaction quality, thus accepting H6. As shown in Figure 2, we used the procedure recommended by (Aiken & West, 1991) for plotting to assess these interaction effects.

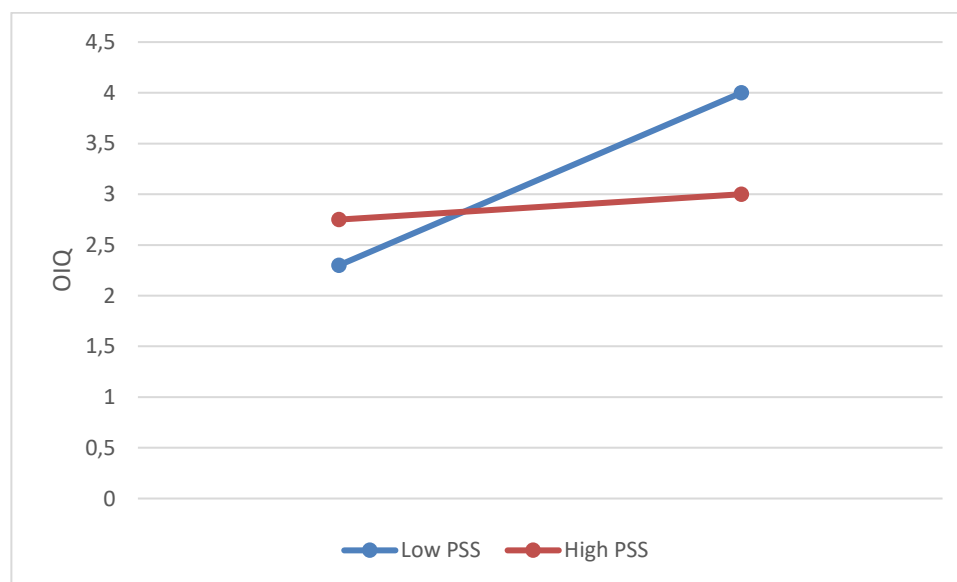


Figure 2. Interaction effects of Perceived Social Support (PSS) with Proactive Personality (PP) on Online Interaction Quality (OIQ)

Figure 2 shows that the interaction pattern and it specifies that proactive personality has a positive relationship with online interaction quality when perceived social support status was high ($r = .50$, $p \leq .001$), while the relationship of proactive personality was negative and significant with online interaction quality when perceived social support was low ($r = -.14$, $p \leq .01$).

4. Moderated Influence of Perceived Social Support on Mediation Effect

To analyze moderated mediation analysis, this study used the process macro method proposed by (Preacher, Rucker, & Hayes, 2007). In indirect relationships, the bootstrapping method can be

used to test the influence of the moderator on different levels of mediations. This method facilitates to adjust normality to distribute the mediation effect through confidence interval depends on bootstrapping. Moreover, predicting effects on outcome variables can be produced through this testing technique. Similarly, the moderator can test the indirect influence between the predictor variable and the outcome variable (through mediator). This study produced 95% bootstrap of confidence intervals (CIs) for indirect effects conditioned by perceived social support depending on 5000 bootstrapping samples. Results in Table 6 shows that confidence intervals for bootstrapping test on the values of perceived social support include 1 SD below

mean, mean, and 1 SD above the mean. If the value between low CI and high CIs do not include zero, the effect is significant. It has been already mentioned that the mediation effect of internet

self-efficacy was insignificant. Therefore, this study did not test the moderation of this insignificant mediation. Thus, H7 is not supported.

Table 6. Moderated Mediation Results for OIQ Across Levels of PSS on SC

Perceived Social Support	Boot Indirect Effects	Boot SE	Boot Lower Limit 95% CI	Boot Upper Limit 95% CI
-1 SD	0.47	0.0402	0.0192	0.1426
Mean	0.216	0.0474	0.1333	0.3209
+1 SD	0.395	0.0770	0.2458	0.5479

Note : CI = Confidence Interval; Bootstrap sample size = 5000.

As shown in Table 6, the moderator (perceived social support) affects the mediating effect of online interaction quality in this way the values of the perceived social support are 1 SD above mean (.2458 to .5479) mean (.1333 to .3209) and 1 SD below the mean (.0192 to .1426); lower and upper CIs values do not have zero. Thus, H8 is supported

CONCLUSION

In this study, we tested eight hypotheses to examine the moderated mediation model between student proactive personality and internet-based social capital by collecting data during the peak of the COVID-19 pandemic. Among the eight hypotheses, our findings did not support three hypotheses. Our study shows that students' proactive personality has a significant impact on internet self-efficacy and online interaction quality. Similarly, our study results supported that online interaction quality significantly mediated the connection between students' proactive personality and social capital. Our results validate the previous findings by arguing that higher social capital depends on proactiveness and a higher sense of social responsibility, but it is well known that areas with higher social capital have higher social participation, vitality, and close ties (Nannicini, Stella, Tabellini, & Troiano, 2010). However, we have obtained some distinctive results in our analysis, especially as a mediating role of self-efficacy. This different finding may be due to our choice of an advanced internet self-efficacy scale rather than the common self-efficacy scale (Kim & Beehr, 2017). Similarly, our results may also differ from previous studies due to the COVID pandemic situation and the arrangement of online learning by ensuring social distancing.

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