



# Efficacy of Usage of Social Media on Critical Thinking Disposition of Prospective Chinese Language Teachers in the Post Era of COVID-19

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**Abstract.** In the post era of COVID-19, social media, as internet-based platforms or channels that facilitate communication and exchange of information, ideas, interests, and even culture, has gradually become an important tool for e-learning research and implementation. However, few attempts have been made to explore the impact of social media on critical thinking. The objective of the study is to investigate the efficacy of the usage of social media on critical thinking disposition (CTD) of the prospective Chinese language teachers (PCLT). A cross-sectional survey was conducted among 160 PCLT participants in the Departments of Literature and Journalism of Leshan Normal University in Southwest China. The study was based on the framework composed of the seven critical thinking dispositions of Delphi consensus. Structured questionnaire was used as the tool for data collection. Descriptive statistics, ANOVA, MANOVA were used for the data analysis. The findings of this study showed that the duration of social media use has a moderate degree but statistically significant impact on PCLT' overall CTD and self-confidence, one of the sub-dimensions of CTD, but a significantly low degree impact on truth-seeking, analyticity, inquisitiveness in the dimensions of CTD. The results further revealed that with the increase of the duration of social media use, the level of truth-seeking, analyticity, inquisitiveness of students has increased significantly, but the self-confidence has decreased significantly. Accordingly, this study has shed light on the integration of information technology, particularly, the use of social media, with critical thinking teaching in college education.

**Keywords:** COVID-19 · Usage of Social Media · Efficacy · Critical Thinking Disposition · Prospective Chinese Language Teachers

## 1 Introduction

Social media, as an internet based application and social cultural platform, it has gradually become an important tool to consider in e-learning research and implementation in the post era of COVID-19 [1]. But few attempts have been made to explore the impact of social media on critical thinking which has been recognized as an important competency for teacher professional certification in China.

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Currently, critical thinking is defined as a kind of reasonable reflective thinking following the synthesis of cognitive abilities and disposition [2]. The critical thinking disposition (CTD) was described as seven attributes including truth-seeking, open-mindedness, analyticity, systematicity, self-confidence, inquisitiveness and maturity [3]. To enrich the relevant literature and expand knowledge, the objective of the study tries to investigate the efficacy of the usage of social media on critical thinking disposition (CTD) of the prospective Chinese language teachers (PCLT). A cross-sectional survey is conducted among 160 PCLT participants in the Departments of Literature and Journalism of Leshan Normal University in Southwest China. Seven critical thinking dispositions of Delphi consensus provide a framework the study based on. Structured questionnaire will be used as instrument of data collection. For the data analysis, descriptive statistics, a series ANOVA, MANOVA will be used to discover the efficacy of duration of social media use on overall critical thinking and its components. In the other words, the current study will seek the answers to the following questions:

- Q1 Does the overall critical thinking disposition of prospective Chinese language teachers differ significantly according to duration of social media use? If does, to what extent?
- Q2 Do the seven dimensions of critical thinking disposition of prospective Chinese language teachers differ significantly according to duration of social media use? If do, to what extent?

## 2 Methodology

### 2.1 Research Design

This study adopts one of the general survey models: relational survey model. The relational survey model intends to determine the presence and/or degree of co-variation between two and more variables. The rationale behind using the relational survey model is that the relationship between time duration and the critical thinking disposition of prospective Chinese language teachers was examined in the present study.

### 2.2 Participants

160 prospective Chinese language teachers studying in the departments of literature and journalism of Leshan Normal University participated in this study in southwest China during the 2021–2022 academic year, of whom 144 (90%) were female and 16 (10%) were male aged between 19 and 24 years old. There in after, the researcher prefers to use “PCLT” to refer prospective Chinese language teacher for a shorter and clearer expression.

### 2.3 Data Collection Tools

In order to obtain personal information of the prospective Chinese language teachers, a demographic information form was designed which contains questions about gender,

age of the participants. The other scale used in the present study was Critical Thinking Disposition Inventory-Chinese version (CTDI-CV). It is revised by Peng et al. [5] according to California Critical Thinking Dispositions Inventory (CCTDI). There are 70 questions, cut into seven subscales: “truth-seeking”, “open-minded”, “analyticity”, “systematicity”, “self-confidence” and “maturity”. The Likert 6-point scoring method is used to score from 1 to 6 points presenting “very agree” to “very disagree” respectively. In this study, Cronbach’s Alpha coefficient of the scale was calculated as .793 for the overall scale. Furthermore, the Cronbach’s Alpha coefficient of each sub-scale is 0.586–0.824.

## 2.4 Data Processing Analysis

Spss24.0 software is used to analyze the valid data. First, the normality of the distribution for CTD scores was examined in the data analysis process. The skewness and kurtosis coefficients of the entire questionnaire were acceptable, with the former ranging from  $-1.812$  to  $-0.997$  and the latter ranging from  $-0.641$  to  $2.396$ . There were no floor effects in the three domains. Data were in accordance with the normal distribution. Therefore, parametric tests were used in the statistical analyses.

Descriptive statistics was used to analyze the data having normal distribution. One-way analysis of variance (ANOVA), multivariate analysis of variance (MANOVA), and Post hoc comparisons test were used to determine the group that caused the difference. The .05 significance level was accepted for all tests performed. Evaluation intervals were calculated in order to make sense of averages. The effect sizes for ANOVA, MANOVA were also calculated. The effect size statistics provide information on the magnitude of the differences between groups [4].

To compare the groups, partial eta squared ( $\eta^2$ ) effect size statistics were used. The obtained eta squared values were interpreted as .01 = small effect, .06 = moderate level effect, .14 = big effect [4]. Furthermore, the relationship among time, CTD of the prospective teachers was examined by using variance analysis. ANOVA was used to determine the extent to which the overall level of the prospective Chinese language teachers’ social media use time duration predicts their CTD. Assumptions are namely extreme values, normality. The distribution of the data obtained from CTD and was recorded normal.

## 3 Research Results

### 3.1 Results Related to the First Problem

For the first question (Q1): Does the overall critical thinking disposition of prospective Chinese language teachers differ significantly according to duration of social media use? If does, to what extent? Table 1, Table 2 showed the research results as bellow:

According to Table 1, Table 2, a significant difference was diagnosed between the CTD of prospective Chinese language teachers according to time duration of social media use [ $F(3,156) = 3.759$ ,  $p = .012 < .05$ ]. To compare the groups, partial eta squared ( $\eta^2$ ) effect size statistics were calculated. The obtained eta squared values were

**Table 1.** Descriptive statistics of overall critical thinking.

Disposition (CTD) of prospective Chinese language teachers, how much time do you spend on we chat, buckle and other social media every week during your leisure time in the past year?	Mean	Std. Deviation	N
less than 1 h(A)	3.738	.446	7
1–3 h(B)	3.589	.421	42
3–5 h(C)	3.685	.321	30
more than 5 h(D)	3.843	.432	81
Total	3.742	.422	160

**Table 2.** ANOVA results related to critical thinking disposition (CTD) of prospective Chinese Language Teachers in terms of time duration of social media use.

Dependent Variable	Variance source	Sum of squares	Df	Mean square	F	p	$\eta^2$
CTD	Between groups	1.911	3	.637	3.759*	.012	.067
	Within groups	26.440	156	.169			
	Total	2269.146	160				

\* $p < .05$

interpreted as .01 = small effect, .06 = moderate effect, .14 = big effect [4]. It was observed that the effect size  $\eta^2$  was .067. Therefore, it can say that time duration of social media use has a significant moderate impact on the critical thinking disposition of prospective Chinese language teachers.

### 3.2 Results Related to the Second Problem

For the second question (Q2): Do the seven dimensions of critical thinking disposition of prospective Chinese language teachers differ significantly according to duration of social media use? If do, to what extent? Table 3, Table 4 and Table 5 showed the research results.

When Table 3 was analyzed, it was determined that the average scores for the self-confidence of prospective Chinese language teachers were the lowest among seven of CTD (mean = 3.225, Std. Deviation = .729) Moreover, it was found that as the time duration of social media use increased, so did the average scores for the dimension of CTD has increased except self-confidence.

Table 4 was result of MANOVA. Multivariate test showed the value of Roy's largest root = .124 (converted to F value = 2.691),  $P = 0.012 < .05$ , at a significant level. It indicated that the different duration of social media use was significantly different in at least one of the seven dimensions of CTD. According to a series of analysis of variance, it was revealed that open-mindedness ( $F = 1.315$ ,  $P > .05$ ), systematicity ( $F = 1.608$ ,  $P$

**Table 3.** Descriptive statistics on the seven dimensions of Critical Thinking Disposition (CTD).

CDT LEVEL VARIABLES	How much time do you spend on Wechat, buckle and other social media every week during your leisure time in the past year?	Mean	Std. Deviation	N
Truth-seeking	less than 1 h (A)	3.700	.676	7
	1–3 h(B)	3.836	.745	42
	3–5 h(C)	4.140	.510	30
	more than 5 h(D)	4.093	.559	81
	Total	4.017	.619	160
Open-mindedness	less than 1 h(A)	3.943	.709	7
	1–3 h(B)	4.026	.587	42
	3–5 h(C)	4.037	.386	30
	more than 5 h(D)	4.189	.550	81
	Total	4.107	.543	160
analyticity	less than 1 h(A)	3.443	.714	7
	1–3 h(B)	3.169	.625	42
	3–5 h(C)	3.267	.460	30
	more than 5 h(D)	3.482	.639	81
	Total	3.358	.619	160
systematicity	less than 1 h(A)	3.443	.643	7
	1–3 h(B)	3.531	.583	42
	3–5 h(C)	3.487	.599	30
	more than 5 h(D)	3.698	.532	81
	Total	3.603	.566	160
self-confidence	less than 1 h(A)	3.700	.608	7
	1–3 h(B)	2.955	.756	42
	3–5 h(C)	3.070	.749	30
	more than 5 h(D)	3.382	.663	81
	Total	3.225	.729	160
inquisitiveness	less than 1 h(A)	3.757	.870	7
	1–3 h(B)	3.174	.499	42
	3–5 h(C)	3.353	.714	30
	more than 5 h(D)	3.490	.724	81
	Total	3.393	.688	160

*(continued)*

**Table 3.** (continued)

CDT LEVEL VARIABLES	How much time do you spend on Wechat, buckle and other social media every week during your leisure time in the past year?	Mean	Std. Deviation	N
maturity	less than 1 h(A)	4.171	.415	7
	1–3 h(B)	4.433	.676	42
	3–5 h(C)	4.443	.750	30
	more than 5 h(D)	4.572	.597	81
	Total	4.494	.644	160

**Table 4.** MANOVA results related to time duration of media use impact on the seven dimensions of critical thinking disposition (CTD) of prospective Chinese language teachers.

Variance Source		Df	SSCP							Univariate F	Multivariate Roy's Largest Root
Between groups	truth-seeking	3	3.000	1.221	1.669	1.053	1.390	1.309	1.466	<b>2.690*</b>	.124*
	open-mindedness	3	1.221	1.154	1.556	1.301	1.736	1.053	1.198	1.315 n. s	
	analyticity	3	1.669	1.556	3.035	1.741	4.417	3.036	1.205	<b>2.729*</b>	
	systematicity	3	1.053	1.301	1.741	1.527	2.024	1.137	1.316	1.608 n. s.	
	self-confidence	3	1.390	1.736	4.417	2.024	7.351	5.114	.835	<b>4.961*</b>	
	inquisitiveness	3	1.309	1.053	3.036	1.137	5.114	3.757	.407	<b>2.735*</b>	
	maturity	3	1.466	1.198	1.205	1.316	.835	.407	1.448	1.167 n. s.	
Within groups	truth-seeking	156	58.004	19.560	13.235	11.298	3.313	6.339	29.791		
	open-mindedness	156	19.560	45.648	22.471	23.026	18.706	14.314	21.209		
	analyticity	156	13.235	22.471	57.836	22.920	37.203	31.937	10.423		
	systematicity	156	11.298	23.026	22.920	49.401	32.473	26.226	14.937		
	self-confidence	156	3.313	18.706	37.203	32.473	77.049	42.583	14.700		
	inquisitiveness	156	6.339	14.314	31.937	26.226	42.583	71.425	19.176		
	maturity	156	29.791	21.209	10.423	14.937	14.700	19.176	64.506		

\*  $p < .05$  n. s.  $p > .05$

$> .05$ ), maturity ( $F = 1.448$ ,  $P > .05$ ) were no significant at  $.05$  level, but truth-seeking ( $F = 2.69$ ;  $p < .05$ ), analyticity ( $F = 2.729$ ,  $p < .05$ ), self-confidence ( $F = 4.961$ ,  $p < .05$ ), inquisitiveness ( $F = 2.735$ ,  $p < .05$ ) of prospective teachers' scores for CTD were significant at  $.05$  level. These indicated that duration of media use has impact on the four dimensions of CTD among PCLT.

According to Table 5, the result of the series of and post hoc comparing the groups, partial eta squared ( $\eta^2$ ) effect size statistics were calculated. For truth-seeking,  $F = 2.690$ ;  $p < .05$ , it was observed that the effect size  $\eta^2$  was  $.049$  with mean difference  $C > B$ ,  $D > B$ . For analyticity,  $F = 2.729$ ,  $p < .05$ , it was observed that the effect size  $\eta^2$

**Table 5.** Summary of ANOVA and Post Hoc Comparison results related to time duration of media use impact on the seven dimensions of critical thinking disposition (CTD) of prospective Chinese language teachers.

Variance Source	Sub-dimension name	SS	Df	MS	F	Mean Difference	$\eta^2$
Time duration (Between groups)	truth-seeking	3.000	3	1.000	2.690*	C > B D > B	.049
	open-mindedness	1.154	3	.385	1.315 n. s.		.025
	analyticity	3.035	3	1.012	2.729*	D > B	.050
	systematicity	1.527	3	.509	1.608 n. s.		.030
	self-confidence	7.351	3	2.450	4.961*	D > B D > C	.087
	inquisitiveness	3.757	3	1.252	2.735*	A > B D > B	.050
	maturity	1.448	3	.483	1.167 n. s.		.022
Error (Within groups)	truth-seeking	58.004	156	.372			
	open-mindedness	45.648	156	.293			
	analyticity	57.836	156	.371			
	systematicity	49.401	156	.317			
	self-confidence	77.049	156	.494			
	inquisitiveness	71.425	156	.458			
	maturity	64.506	156	.413			

\*  $p < .05$  n. s.  $p > .05$

was .050 with mean difference D > B. For inquisitiveness,  $F = 2.735$ ,  $p < .05$ , mean difference were A > B, D > B, it was observed that the effect size  $\eta^2$  was .050. For self-confidence,  $F = 4.961$ ,  $p < .05$  with mean difference D > B, D > C, it was observed that the effect size  $\eta^2$  was .087.

According to Pallant that the obtained eta squared values were interpreted as .01 = small effect, .06 = moderate effect, .14 = big effect [4]. Therefore, it can be said that time duration of social media use has a significant low impact on the truth-seeking, analyticity, inquisitiveness of CTD of PCLT, and moderate effect on the self-confidence of CTD of PCLT.

According to significant mean differences among dimensions of CTD, it was observed that the more time one spent on social media, the higher level one would achieve of truth-seeking, analyticity, self-confidence, inquisitiveness of critical thinking disposition.

## 4 Research Conclusion

In this study, it was investigated that the efficacy of the usage of social media on critical thinking disposition of the prospective Chinese language teachers. A cross-sectional survey was conducted among 160 prospective Chinese language teacher participant in the Departments of Literature and Journalism of Leshan Normal University in Southwest China. Seven critical thinking dispositions of Delphi consensus formed framework the study based on. Structured questionnaire was used as instrument of data collection. For the data analysis, descriptive statistics, a series of one-way analysis of variance (ANOVA), multivariate analysis of variance (MANOVA), post hoc comparison were used. The findings of this study showed the duration of social media use has significant moderate impacts on the prospective Chinese language teachers' overall critical thinking disposition, self-confidence of sub-dimensions of critical thinking disposition, and significant low impacts on truth-seeking, analyticity, inquisitiveness in the dimensions of critical thinking disposition. The results further revealed that with the increase of the duration of social media use, the level of truth-seeking, analyticity, inquisitiveness of students has increased significantly, but the self-confidence has decreased significantly.

## 5 Suggestions

In view of the significant positive moderate effect of social media on the overall critical thinking disposition and its sub-dimension of self-confidence, educators and computer designers of online curriculum design can consciously and appropriately integrate social media into online learning to develop students' high-order thinking. Considering the research results that with the increase of the use time of social media, the students' level of truth-seeking, analyticity and inquisitiveness has been significantly improved, while their self-confidence has significantly decreased, educators and relevant information technology workers can consciously and properly control the time variables of the use of social media in online and offline learning activities.

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