

Efficacy of SPOC Usage Based on Course Portal on the New Media Literacy of Future Excellent Rural Chinese Language Teachers

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Abstract: With digital transformation of education in China, a growing number of local higher education teacher training institutions are creating small private online courses, or SPOC, based on course portals to precisely prepare excellent future teachers. However, few attempts have been made to explore the educational efficacy of this new media. To this end, this study investigates the efficacy of SPOC built on the Chaoxing platform course portal on the new media literacy of student teachers. This was a cross-sectional survey of a random sample of 160 future excellent rural Chinese teachers from Leshan Normal University in Southwest China. This study explored the efficacy of SPOC usage time on new media literacy through a relational model. A structured questionnaire was used as the data collection tool. Data were analyzed using descriptive statistics, ANOVA, ANOVA, and post hoc tests. The results of this study indicated that SPOC use duration had significant moderate efficacy on the overall new media literacy and its six sub-dimensions of collective intelligence, simulation, distributed cognition, judgment, appropriation, and visualization in addition to significant small efficacy on performance and large efficacy on the play sub-dimension. Thus, this study enriches knowledge about the efficacy of new media in teacher education and has implications for people to design and make more economical use of SPOC built on course portals.


1 INTRODUCTION


At present, with the digital transformation of China's basic education and education reform based on literacy, training "excellent teachers" for rural primary and secondary schools, that is, teachers who are competent in core literacy education, has become an important task for teacher education colleges and universities. Accordingly, the dominant direction and educational goals of teacher education curriculum reform have gradually shifted from "acquiring knowledge and skills" to "mastering core competencies" (China Institute of Education Innovation of Beijing Normal University, 2021). In order to precisely cultivate rural-oriented teachers of excellence, many local teacher education colleges

and universities have begun to use the course portal of the Chaoxing platform to establish a large number of small, school-level small private online courses, or SPOC for short.

Although, SPOC has gradually become an important tool to be considered in the digital transformation of education in the post-COVID-19 era (Zhu & Hu, 2022), but few attempts have been made to investigate effects of SPOC on the development of the future excellent Chinese teachers oriented rural education. Among them, as one of the key competencies, new media literacy, which is used by excellent teachers to provide primary and middle school students with diverse and effective learning resources under the new media landscape, has also not been tested and explored in the effect of SPOC education. In this study, new media literacy refers to

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a set of social and cultural skills necessary to survive in a new media environment (Jenkins et al., 2006; Lee, 2022; Marcus, 2019; Liu, 2021).

To enrich the relevant literature and expand knowledge, this study investigated the impact of using four small private online courses on the Chaoxing platform course portal on the new media literacy (NML) of future rural Chinese language teachers of excellence.

This was a cross-sectional survey involving 160 participants in the Departments of Literature and Journalism of Leshan Normal University in Southwest China. Jenkins' 12 new media literacy skills provide a framework the study based on. Structured questionnaire will be used as instrument of data collection. For the data analysis, MANOVA will be used to discover and test effects of duration of SPOC use on overall NML and its dimensions. Structured questionnaire will be used as instrument of data collection. In the other words, the current study will seek the answers to the following questions:

·Q1 Does the overall new media literacy of the future excellent Chinese teachers oriented rural education differ significantly according to duration of SPOC use? If does, to what extent?

·Q2 Do the twelve dimensions of new media literacy of the future excellent Chinese teachers oriented rural education differ significantly according to duration of SPOC use? If do, to what extent?

2 CONCEPT DEFINITION AND THEORETICAL FRAMEWORK

2.1 Concept Definition

2.1.1 What is New Media?

According to Jenkins et al., new media refers to various socio-cultural platforms based on information technology.

2.1.2 What is a Course Portal?

A course portal is a new type of course management website with pedagogical dimensions such as time, content, and activities. As a new type of educational media, its content is usually created by the course instructor, and its website elements consist of basic functional components such as home page, activities, materials, announcements, assignments, exams, discussions, and administration.

2.1.3 What is SPOC Based on Course Portal?

SPOC means small, private and online courses. SPOC based on course portal, refers to small, private online courses created by the instructor of the course through the Chaoxing course portal. It is a new concept put forward by Harvard University after MOOC, and is called "post-MOOC". Unlike MOOC, SPOC, based on course portal, has restrictions on the number of students and conditions for enrollment, but it is still open and free.

Based on the course portal, the basic information on the home page of SPOC consists of six areas: course introduction, faculty team, teaching methods, reference materials, teaching resources, and course chapters. the activities of SPOC consist of a library of activities such as sign-in, voting, selection, quizzes, topic discussions, accompanying exercises, questionnaires, grading, and group tasks; the statistics of SPOC consist of class statistics, resource statistics, course reports, course SPOC's materials consist of course materials, question bank, assignment bank, test bank, etc. SPOC's notifications mainly consist of instructor's notifications; SPOC's assignments mainly consist of instructor's additions and assignment bank management; SPOC's management consists of instructor team management, assistant instructor management, course management, class assignment, download center, operation log, and course review.

2.1.4 What is the Use of SPOC Based on Course Portal?

In this study, evidence of course portal-based SPOC usage is presented by data on the number of course selections, lecture resources, non-video resources, course materials, course announcements, class activities, quizzes and assignments, interactive communication, assessments (tests), and cumulative page views. To simplify the survey relationship model, this study used the mean value of the weekly time spent by course-taking students using the four SPOCs as the independent variable.

2.2 Theoretical Framework

For the dependent variables, this study used Jenkins' 12 constructs of new media literacy. Jenkins et al defined the 12 sub-dimensions that constitute New Media Literacy (NML) as follows (Jenkins et al., 2006).

·Play: The competency to experiment with one's surroundings as a mean of problem-solving.

·Performance: The competency to employ alternative identities for improvisation and discovery purposes.

·Simulation: The competency to interpret and establish dynamic models of authentic world processes.

·Appropriation: The competency to meaningfully sample and remix media content.

·Multitasking: The competency to observe one's own environment and shift focus to important details as needed.

·Distributed cognition: The competency to interact meaningfully with tools that expand mental competence.

·Collective intelligence: The competency to bring knowledge together and compare notes with others toward a common goal.

·Judgment: The competency to assess the reliability and credibility of different information sources.

·Trans-media navigation: The competency to trail the flow of stories and information across multiple modalities.

·Networking: The competency to search for, synthesize, and disseminate information.

·Negotiation: The competency to pass through various communities, discerning and honoring multiple viewpoints, and grasping and following alternative norms.

·Visualization: The competency to interpret and create data representations for the purposes of expressing ideas, finding patterns, and identifying trends.

3 METHODOLOGY AND MATERIAL

3.1 Literacy Training Materials for Research

In order to better realize the digital transformation of education and train more excellent language teachers for rural education, a team of language pedagogy teachers from the Department of Literature and Journalism of Leshan Normal University has been offering four small-scale private teacher education online courses (SPOC) on the Chaoxing platform as literacy training materials since February 2020. They are "Study of Language Test Questions in Chinese and English Exams", "Secondary Language

Pedagogy", "Implementation and Evaluation of Secondary Language Classroom Teaching", and "Secondary Language Teaching Design". Over the past two years, more than 700 Chinese Language and Literature majors have taken these four SPOC courses. The teaching method is a hybrid online and offline teaching, and the teaching time is synchronized with the face-to-face teaching lectures at Leshan Normal University. The content of these SPOC courses, such as chapter content, course resources, online forums and other student-teacher interaction activities, are created and managed by the instructors. Students' learning effects and progress are intelligently managed by the Chaoxing course portal. Among them, teachers can refer to Chaoxing's intelligent management to implement precise interventions on students' learning.

3.2 Participants

In November 2021, we randomly sampled 160 students among more than 700 Chinese language and literature majors who had participated in the use of new media in education, i.e., had used four SPOC courses based on the Chaoxing course portal. Of these, 144 participants (90%) were female and 16 (10%) were male, ranging in age from 19-24.

3.3 Research Design

One of the general survey models was used in this study: the relational survey model. The relational survey model intends to determine the degree of existence and/or covariation between two and more variables. Based on this principle, this study investigated the relationship between the duration of SPOC use based on Chaoxing course portals and the new media literacy of future Chinese language teachers

3.4 Data Collection Tools

In order to obtain personal information of the future excellent Chinese teachers oriented rural education, a demographic information form was designed which contains questions about gender, age of the participants. The other scale used in the present study was new media literacy developed by Literat (Literat, 2014) according to the 12 New Media Literacy Skills (NMLS). There are 57 questions, cut into twelve sub scales: play, simulation, performance, appropriation, multitasking, distributed cognition, collective intelligence, judgment, trans-media navigation, networking, negotiation and visualization. The Likert

5-point scoring method is used to score from 1 to 5 points presenting “strongly disagree” to “strongly agree” respectively. In this study, Cronbach’s Alpha coefficient of the scale was calculated as 0.938 for the overall scale. Furthermore, The Cronbach alpha coefficient of subscales ranges from 0.885 to 0.898.

3.5 Data Processing Analysis

To compare the mean vectors of each group, we used analysis of variance to evaluate the impact of SPOC use on the overall new media literacy and its sub dimensions SPSS 24.0 software was used to analyze the valid data. Descriptive statistics was used to analyze the data having normal distribution. One-way analysis of variance (ANOVA), multivariate analysis of variance (MANOVA) 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 (Pallant, 2020).

To compare the groups, partial eta squared (η^2) effect size statistics were used. The obtained eta

squared values were interpreted as .01 = small effect, .06 = moderate level effect, .14 = big effect (Pallant, 2020). Furthermore, the relationship between time duration of SPOC use and new media literacy of the future teachers was examined by using variance analysis. ANOVA was used to determine the extent to which the overall and sub dimensions levels of the future Chinese language teachers’ SPOC use time duration predicts their new media literacy. Post Hoc Tests was used to identify which time duration groups had significant differences and what kind of difference. Assumptions are namely extreme values, normality. The distributions of the data obtained from new media literacy were recorded normal.

4 RESEARCH RESULTS

4.1 Results Related to the First Problem

For the first question (Q1): Does the overall new media literacy of future rural excellent Chinese teachers differ significantly according to duration of SPOC use? If does, to what extent? Table 1, table 2 and table 3 showed the research results as bellow:

Table 1: Between-subjects factors

		Value Label	N
How long did you spend on the SPOC every week in the last year	A	less than one hour	62
	B	1-3 hours	63
	C	3-5 hours	23
	D	more than 5 hours	12

Table 1 showed the descriptive statistics of different SPOC duration on the whole of new media literacy. For value labels, Group A (n=62) referred to the use of SPOC for less than 1 hour per week, Group B (n=63) referred to the use of SPOC for less

than 1-3 hours per week, Group C (n=23) referred to the use of SPOC for less than 3-5 hours per week, Group D (n=12) referred to the use of SPOC for less than 3-5 hours per week.

Table 2: Descriptive statistics of overall new media literacy of future excellent Chinese teachers

	N	Minimum	Maximum	Sum	Mean	Std. Deviation	Skewness	Std. Error	Kurtosis	Std. Error
NML	160	2.98	5.00	596.05	3.7253	.39309	.285	.192	-.025	.381
Valid	160									

Table 2 showed the skewness and kurtosis coefficients of the new media literacy (NML) questionnaire were acceptable with the former was .285 and the latter was -.025. And Minimum,

maximum, mean were no floor effects in overall new media literacy. In conclusion, data were in accordance with the normal distribution. Therefore, parametric tests were used in the statistical analyses.

Table 3: ANOVA results related to the overall new media literacy of future rural excellent Chinese teachers in terms of time duration of SPOC use

	Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Between Groups	2.87	3	.95	6.90	.000***	.117
Within Groups	21.69	156	.13			
Total	24.56	159				

*p < .05 **P< .01 ***P < .001

According to Table 3, a significant difference was diagnosed between the overall new media literacy (NML) of future Chinese language teachers according to time duration of SPOC use [F (3, 156) =6.90, p=.000<.05]. To compare the groups, partial eta squared (η^2) effect size statistics were calculated. The obtained eta squared values were interpreted as .01 = small effect, .06 = moderate effect, .14 = big effect (Literat, 2014). It was observed that the effect size η^2 was .117. Therefore, it can be said that time duration of SPOC use has a significant moderate efficacy on the overall media literacy of future Chinese language

teachers.

4.2 Results Related to the Second Problem

For the second question (Q2): Do the twelve dimensions of new media literacy of future excellent Chinese language teachers oriented rural education differ significantly according to duration of SPOC use? If do, to what extent? Table 4, table 5 and table 6 showed the research results as bellow:

Table 4: Descriptive statistics on the twelve dimensions of new media literacy

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Std. Error	Kurtosis	Std. Error
play	160	2.60	5.00	3.86	.56	.20	.19	-.13	.38
simulation	160	2.20	5.00	3.75	.55	.13	.19	.02	.38
performance	160	1.75	5.00	3.48	.62	.02	.19	.06	.38
appropriation	160	2.20	5.00	3.54	.58	.11	.19	-.01	.38
distributed cognition	160	2.40	5.00	3.72	.51	.22	.19	.06	.38
multitasking	160	2.40	5.00	3.58	.56	.16	.19	-.07	.38
collective intelligence	160	2.60	5.00	3.84	.50	.05	.19	-.14	.38
judgment	160	3.00	5.00	3.85	.53	.11	.19	-.31	.38
trans-media navigation	160	1.40	5.00	3.89	.63	-.40	.19	1.05	.38
networking	160	2.00	5.00	3.57	.59	.27	.19	-.06	.38
negotiation	160	2.40	5.00	3.80	.59	-.06	.19	-.27	.38
visualization	160	2.67	5.00	3.78	.56	.24	.19	-.18	.38

Table 4 showed statistics of minimum, maximum, mean were no floor effects in twelve dimensions of new media literacy (NML). The skewness and kurtosis coefficients of the entire questionnaire were acceptable with the former ranging from 0.02 to -

-0.40 and the latter ranging from 0.02 to 1.05. The data were normally distributed. Therefore, parametric tests were used in the statistical analyses of twelve dimensions of new media literacy (NML).

Table 5: MANOVA results related to time duration of media use impact on the twelve dimensions of new media literacy of future rural excellent Chinese teacher

Variance Source	Dependent Variable	Df	SSCP Matrix												F	Wilks' Lambda
Between Groups	play	3	8.29	6.03	5.16	4.74	4.48	4.08	5.81	4.45	3.55	2.60	3.15	4.43	10.28***	1.72**
	simulation	3	6.03	4.74	3.86	3.69	3.77	3.14	4.36	3.16	2.32	1.51	1.74	2.96	5.56***	
	performance	3	5.16	3.86	3.30	3.22	3.05	2.69	3.77	2.97	2.17	1.61	1.86	2.86	2.96*	
	appropriation	3	4.74	3.69	3.22	3.59	3.30	2.79	3.83	3.29	1.97	1.59	1.64	3.00	3.63*	

	distributed cognition	3	4.48	3.77	3.05	3.30	3.36	2.64	3.56	2.73	1.61	1.05	1.03	2.36	4.55**	Wilks' Lambda=1.72 Sig. p= .007
	multitasking	3	4.08	3.14	2.69	2.79	2.64	2.25	3.12	2.54	1.68	1.27	1.39	2.36	2.38n.s.p	
	collective intelligence	3	5.81	4.36	3.77	3.83	3.56	3.12	4.36	3.56	2.45	1.89	2.12	3.38	6.18***	
	judgment	3	4.45	3.16	2.97	3.29	2.73	2.54	3.56	3.32	2.10	1.90	2.06	3.18	4.15**	
	trans-media navigation	3	3.55	2.32	2.17	1.97	1.61	1.68	2.45	2.10	1.74	1.46	1.80	2.21	1.45n.s.p	
	networking	3	2.60	1.51	1.61	1.59	1.05	1.27	1.89	1.90	1.46	1.43	1.70	2.02	1.33n.s.p	
	negotiation	3	3.15	1.74	1.86	1.64	1.03	1.39	2.12	2.06	1.80	1.70	2.12	2.30	2.05n.s.p	
	visualization	3	4.43	2.96	2.86	3.00	2.36	2.36	3.38	3.18	2.21	2.02	2.30	3.17	3.44*	
	play	156	41.93	17.78	18.49	18.82	18.00	20.69	12.39	14.69	13.97	16.59	15.39	14.63		
	simulation	156	17.78	44.39	24.76	20.94	13.24	12.16	13.16	10.24	15.58	13.69	15.20	8.703		
	performance	156	18.49	24.76	58.02	26.97	10.89	19.87	8.1	9.36	14.95	16.07	15.05	12.67		
	appropriation	156	18.82	20.94	26.97	51.35	18.26	20.64	12.95	13.16	26.62	25.47	22.28	22.98		
Within Groups	distributed cognition	156	18.00	13.24	10.89	18.26	38.40	21.76	17.93	20.37	21.26	14.41	21.02	18.97		
	multitasking	156	20.69	12.16	19.87	20.64	21.76	49.31	14.39	19.29	17.82	18.51	22.02	18.53		
	collective intelligence	156	12.39	13.16	8.12	12.95	17.93	14.39	36.73	21.47	21.31	16.83	23.24	18.33		
	judgment	156	14.69	10.24	9.36	13.16	20.37	19.29	21.47	41.64	27.95	21.89	33.01	29.16		
	trans-media navigation	156	13.97	15.58	14.95	26.62	21.26	17.82	21.31	27.95	62.24	34.19	32.52	29.81		
	networking	156	16.59	13.69	16.07	25.47	14.41	18.51	16.83	21.89	34.19	55.78	31.55	21.79		
	negotiation	156	15.39	15.20	15.05	22.28	21.02	22.02	23.24	33.01	32.52	31.55	53.79	35.86		
	visualization	156	14.63	8.70	12.67	22.98	18.97	18.53	18.33	29.16	29.81	21.79	35.86	47.97		

*p < .05 **p < .01 ***p < .001 n. s. p > .05

Table 5 was results of MANOVA. Multivariate test showed the value of Wilks' Lambda=1.72, converted to F value = .67, P = 0.007 < .05 at a significant level. It implied that the different duration of SPOC use was significantly different in at least one of the twelve dimensions of new media literacy (NML). According to a series of analysis of variance, it was revealed that play (F=10.28, P=.000 < .05), simulation (F=5.56, P=.001 < .05), performance (F=2.96, P=.034 < .05), appropriation (F=3.63, P=.014 < .05), distributed cognition (F=4.55, P=.004 < .05), collective intelligence (F=6.18, P=.001 < .05), judgment (F=4.15, P=.007 < .05),

visualization (F=3.44, p=.018 < .05) was significant at .05 level. These indicated that duration of SPOC use has significant efficacy on the eight dimensions of NML among PCLT. However, it can be seen that multitasking (F=2.38; p=.072 > .05), trans-media navigation (F=1.45, p=.2 > .05), networking (F=1.33, p=.26 > .05), negotiation (F=2.05, p=.10 > .05) of future teachers' scores for NML were no significant at .05 level. These implied that duration of SPOC use has no significant efficacy on the four dimensions of NML among future excellent rural Chinese language teachers.

Table 6: Summary of ANOVA and Post Hoc Test results related to time duration of SPOC use impact on the twelve dimensions of new media literacy of future rural excellent Chinese language teachers

Variance Source	Dependent Variable	Sum of Squares (SS)	Df	Mean Square (MS)	F	Sig. P	Partial Eta Squared (η ²)	Post hoc test
(Between groups)	play	8.29	3	2.76	10.28	.000	.165	C>A C>B D>A D>B
	simulation	4.74	3	1.58	5.56	.001	.097	C>A C>B
	performance	3.30	3	1.10	2.96	.034	.054	C>A C>B D>A
	appropriation	3.59	3	1.19	3.63	.014	.065	C>A C>B D>A D>B

	distributed cognition	3.36	3	1.12	4.55	.004	.081	C>A C>B
	collective intelligence	4.36	3	1.45	6.18	.001	.106	C>A C>B
	judgment	3.32	3	1.10	4.15	.007	.074	D>A D>B
	visualization	3.17	3	1.05	3.44	.018	.062	D>A D>B
	play	41.93	156	.26				
	simulation	44.39	156	.28				
	performance	58.02	156	.37				
Error	appropriation	51.35	156	.32				
(Within groups)	distributed cognition	38.40	156	.24				
	collective intelligence	36.73	156	.23				
	judgment	41.64	156	.26				
	visualization	47.97	156	.30				

*p < .05 **P < .01 ***P < .001 n. s. p > .05

According to Table 6, the results of the series of ANOVA and Post Hoc Test, partial eta squared (η^2) effect size statistics and comparison results of mean values of different time duration variables were calculated. For play ($F=10.28$, $p<.05$), it was observed that the effect size η^2 was .165 with mean difference of groups C>A, C>B, D>A, D>B. For simulation ($F=5.56$, $p<.05$), it was observed that the effect size η^2 was .097 with mean difference C>A, C>B. For performance ($F=2.96$, $p<.05$) with mean difference of groups were C>A, C>B D>A, it was observed that the effect size η^2 was .054. For appropriation ($F=3.63$, $p<.05$) with mean difference C>A, C>B, D>A, D>B, it was observed that the effect size η^2 was .065. For distributed cognition ($F=4.55$, $p<.05$) with mean difference C>A, C>B and the effect size $\eta^2=.081$. For collective intelligence ($F=6.18$, $p<.05$) with mean difference C>A, C>B. For judgment ($F=4.15$, $p<.05$), the effect size $\eta^2=.074$ were found. For visualization ($F=3.44$, $p<.05$) with mean difference D>A, D>B.

According to Pallant that the obtained eta squared values were interpreted as .01=small effect, .06=moderate effect, .14=big effect (Pallant, 2020). Therefore, it can be said that time duration of SPOC use has a significant big efficacy on the play and significant moderate efficacy on the collective intelligence, simulation, distributed cognition, judgment, appropriation, visualization and significant small efficacy on performance of NML of FRCLTE.

According to honestly significant difference (HSD) of Post Hoc Test, it was observed that no significant difference existed between group C and group D among play, collective intelligence, simulation, distributed cognition, judgment, appropriation, visualization of new media literacy. This means that the effect of using SPOC for 3-5 hours a week is no different from that of using SPOC for more than 5 hours a week. In other words, it may be more economical to spend 3-5 hours a week on

SPOC for more than 5 hours on it.

5 RESEARCH CONCLUSION AND SUGGESTIONS

5.1 Research Conclusion

This study investigated the educational efficacy of SPOC built on course portal on future excellent teacher in the context of education digital transformation. In this study, the efficacy of the usage of SPOC built on Chaoxing course portal on new media literacy of future rural excellent Chinese language teacher was investigated. A cross-sectional survey was conducted on 160 participants coming from the Departments of Literature and Journalism of Leshan Normal University in Southwest China. Twelve new media literacy formed framework the study based on. Structured questionnaire was used as instrument of data collection. For the data analysis, analysis of variance (ANOVA), multivariate analysis of variance (MANOVA) were used. The findings of this study showed the duration of SPOC use has significant big efficacy on the sub dimensions of new media literacy called play. And it has significant big efficacy on the overall new media literacy and its six sub dimensions called collective intelligence, simulation, distributed cognition, judgment, appropriation, visualization. And it has significant small efficacy on the one sub dimension of new media literacy called performance among the future rural excellent Chinese language teachers. In addition, an interesting phenomenon was found that the SPOC built on Chaoxing course portal did not change significantly new media literacy levels in some specific period of usage time.

5.2 Implications

Given the significant positive big or moderate efficacy of SPOC on play, overall new media literacy and its sub-dimensions such as collective intelligence, simulation, distributed cognition, judgment, appropriation, and visualization, educators and course portal designers can sure that SPOC based on course portals can effectively develop student teachers' 21st century skills that would well meet the core literacy requirements of basic education, such as new media literacy. Considering that there was no significant difference between the findings of Group C and Group D, teacher educators and course portal architects should consciously and appropriately control the time variable of using SPOC in curriculum portals to more effectively foster future rural Chinese language teachers.

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