

Online Participation, Civic Engagement and Identity of Ethnic Minority Students in Hong Kong¹

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Abstract

Understanding Hong Kong ethnic minority (EM) students' perceptions of their online participation, civic engagement and civic identity is important for enriching the lives of EM students in Hong Kong. This study explored the relationship between online participation, civic engagement and identity in selected Hong Kong EM schools using validated measures such as perception of online participation, online participation through online social media platform, civic awareness through online participation, civic identity of Hong Kong first, civic identity of emotional attachment to Hong Kong, civic engagement at school, and civic engagement in the community. The questionnaire survey was conducted in five Hong Kong secondary schools which have EM students. Hong Kong EM students is defined as a group of students who belong to different ethnic groups which form a small proportion of population in Hong Kong. The target population is EM and students in the Form 1 to Form 6 classes of selected secondary schools in Hong Kong. The purposeful stratified method has been applied as sampling strategy to collect data from the schools. A total of 748 students participated in the study. EM students score higher on the measures of online participation based on survey results, which suggests that online participation is strongly related to their civic engagement and identity. The results suggest that EM students reported civic engagement and identity limited to their cultural group and expressed more confidence in online participation. This research has demonstrated a link between online participation, civic identity and civic engagement. In particular, the important role of civic identity has been highlighted for EM students and this has implications for both policy and practice. The conclusion has policy implications for designing school citizenship education curriculum to promote civic engagement of EM student in Hong Kong.

Keywords

civic engagement, civic identity; ethnicity; online participation

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I. Introduction

In this age of technological innovation, understanding the transformation of democracy and citizenship is essential for strong democracies and the development of good future citizens. Citizenship that has been clearly defined by Marshall (1950) as the right and ability to participate in a society where individuals navigate democracy and its values. Yet democracy has not always been easy to define especially where ethnic minority identities become embedded in the fabric of societies. Democracy then becomes a collection of movements, practices and institutions (Simon *et al.*, 2017). For Hong Kong's ethnic minorities (EM), who are not local citizens, negotiating local institutions is complex leading them to experience difficulties with participation, identity and institutional oppression stemming from the racism that is embedded in the local dominant culture. The way EM 'navigate' Hong Kong's institutional contexts, therefore, is an issue of major importance for them personally and for Hong Kong society as a whole.

Nowadays, online social media has become a popular platform for EM to navigate individually in Hong Kong society. Exposure to digital devices begins at a very young age in Hong Kong, which has become well known for being inhabited by netizens. Hong Kong's internet culture, based on using online social media amongst young people, has given rise to "keyboard warriors" (Ma, 2014). Yet little is known about how online participation (OP), as a form of civic engagement, impacts on young people's civic identity (CI) and civic engagement (CE). Therefore, this study that is focused on Hong Kong's EM students examines the relationship between CI, OP and CE among a sample of such students. EM includes both Hong Kong born and new arrivals such as Indians, Pakistanis, and Nepalese. It will address citizenship issues related to EM students in the new online environment, and how these are related to developments in contemporary democracies. The results of this study will have implications for theory, policy and practice in connection with EM, their citizenship, identity and the role of online social media in influencing these. The "keyboard warrior" culture is an emerging one in Hong Kong: whether it applies to EM, in what ways, with what effect and for what reasons are unexplored issues and for this reason they will be addressed by the current study.

The study will explore the relationship between online participation, civic identity and civic engagement of EM students in Hong Kong. While there is an emerging literature on youth online participation in the Hong Kong context (Chan, 2013, Dong *et al.*, 2017)) the focus is on local Chinese youth rather than EM students. However, it has been shown that civic identity issues for EM students are complex since their citizenship, by law, resides in a home country even though their residence is in Hong Kong (Bhowmik, Kennedy & Hue, 2017). This will be the first study that focuses specifically on the role and impact of online participation on EM civic identity and civic engagement.

In addition, Kennedy (2016) and Ng, Kennedy and Hue (2017) have indicated that many young Hong Kong EM students see themselves as "Hongkongers" who

show little interest in China or their home countries. But there is very limited research that explores how their civic identity develops and how online participation might facilitate this phenomenon. What is more, Cheung & Chou (2017) have shown that Pakistani students are more likely to live in poverty whereas Indian students are relatively wealthy in Hong Kong. This raises the issues of a potential digital divide between different groups of EM students and whether this issue impacts on EM students' online participation. Therefore, it will be interesting to investigate this issue.

II. Literature Review

Based on a literature review, the following background evidence is provided for (i) the relationship of online participation and civic engagement, (ii) the relationship of online participation and civic identity, (iii) the effect of online participation on civic engagement, (iv) the effect of online participation on civic identity, (iv) effect of demography and civic identity on civic engagement, and (v) the necessity for tackling 'digital divide' issues ethnic minority students. Although there is currently no predetermined definition of what "online social media" that should be applied for evaluating the relationship of CI, OP and CE for EM students, the study will propose to restrict the "online social media" platform for the EM students who access the Internet and other online resources via a range of technologies such as personal and laptop computers, tablets, mobile and smart phones, digital television and media players, etc. The online social media make possible many kinds of online participation including consumption, production, sharing and mixing of text-based photographic, video, audio content in "online social media" platform, and role-playing via virtual worlds/online social communities, gaming, video, and online phone/video communications, etc.

A. Relationship of online participation and civic engagement

The rapid rise of online social media in the past decade appears to have strengthened civic participation, particularly among students in Hong Kong (Ng, Kennedy and Hui, 2019). Since it has been argued that as Hongkongers become more educated, general interest in politics is bound to increase and spur individuals to intensify their civic activities (Chan, 2013). Furthermore, studies show the positive role of social media in building social capital, particularly among the youth (Ahn, 2011; Ellison *et al.*, 2011), it maybe that CE is being reinvented with the help of these technological innovations (Syvertsen *et al.*, 2011). Hence, it will be interesting to consider how different the reinvention is between the EM and other local HK students.

The use of online social media by student activists to organize the 'Umbrella Revolution' and the Occupy Central Movement drew tremendous attention from across the world (Bowyer & Kahne, 2016). Kaiman (2014) claimed that the

'Umbrella Movement' may be the best-documented social movement in the history of Hong Kong on account of the extensive use of social media. In a modern city like Hong Kong, with high levels of personal freedom, social media have few constraints and were a vibrant factor in sustaining the protest movement. Protesters and their supporters could access more passionately supportive reports in social media. Voluntary reporting on Facebook-based news outlets quickly attracted 100,000 subscribers (Kaiman, 2014). Such media could also be used to bring supporters quickly to the streets.

Another popular Web forum used by protest participants was HKGolden.com that was boosted to 2.9 million pages views per day after the police used tear gas in the initial stages of the 'Umbrella revolution' (Siu, 2014). The site was used to provide participant updates on the occupy movement, share tactics, and encourage participation. That the police were monitoring messages being passed around among the protesters was evident from the arrest of a young man. After such an arrest the site host encouraged users not to post calls for people to join the protest because they risked being charged with incitement to unlawful assembly or criminal use of a computer (Siu, 2014). Protesters would still try to code their calls for support with words like "going hiking" or, after the Chief Executive called for people to support merchants in the cleared protest areas, by inviting people to "go shopping". Among these "shoppers" the Chief Executive is often referred to as "689" based on the number of votes by which he was elected in the Election Committee in 2012 (Siu, 2014).

Therefore, the impact of online social media has provided new opportunities for civic participation in Hong Kong. It has been acknowledged internationally that social media's transformation from an electronic network designed to connect pages, documents and files, to one increasingly linking people, ethnic groups and communities, has undoubtedly spurred a new wave of interest in this topic of quest for civic rights in the digital age (Kahne *et al.*, 2013). Furthermore, with its widespread diffusion and maturation as a medium, the online social media platform has become a vital component of the technological infrastructure that enables civic life in ethnic communities. Yet little is known about the role of online social media in promoting or eroding OP and CE specifically amongst Hong Kong's EM and this will be a focus of the current study.

B. Relationship of online participation and civic identity

As online social media have evolved, there has been much interest in the relationship between civic identity (CI) formation and online participation (OP) (Gitelman, 2006). The study of its relationship is highly contested and is often conceptualized as determined by online social media with the view that online participation produces change in individuals (Turkle, 2011). Lievrouw and

Livingstone (2006) suggested online social media platform can best be understood as “infrastructures” in which online participation becomes possible.

What are specific contexts that transform the civic identity of Hong Kong EM students through online participation? In Hong Kong, civic activism via online social media has attracted considerable attention in recent years. The world watched as student activists used online social platform to organize protests during the Hong Kong’s Umbrella Movement and Occupy Central Movement (Bowyer & Kahne, 2016; Chan, 2013). Hence, Hong Kong is a suitable site for research examining the relationship between OP, CI and CE among EM students. In order to understand the role of OP in the creation and maintenance of CI and the process of CE of EM students in Hong Kong, it is important to go beyond measures such as ‘hours of use’ (Shah *et al.*, 2001) or even ‘intensity of use’ (Ellison *et al.*, 2007) and focus on EM students’ specific uses of keyboard for OP that mediates the relationships between CI and CE.

The developmental process of EM students’ CE, CI and OP during this online era can be distinguished into the school and the individual levels which “proceed over time in a mutually interdependent way” (Valsiner, 1989) and change can be promoted by their transaction. Valsiner’s perspective views civic development as a dynamic process that involves multiple levels of bidirectional transactions between students and the multiple heterogenous contexts of schools in which they study. Valsiner (2000) points out that it is necessary to examine the complex phenomena in order to understand how CE, CI and OP have come to be developed in their present forms and how they may be developed in the future.

EM student’s OP is assumed to have impact on his/her development of CI. In addition, EM student who attends school, his/her educational worlds are even more complex (Arat *et al.*, 2016). Valsiner (2000) referred to education as having a double function. The first function is to foster the acquisition of skills and knowledge, and the second is to provide indirect guidance towards socially expected ways of acting, thinking and feeling towards the others. For EM students who attend schools, it could be argued that OP is a similar process which directs them in the direction by guiding them towards cultural ways of acting, thinking and feeling digitally towards the others. In this sense, OP can be expected to have the effect of bringing EM students closer to their cultural contexts and reinforcing the development of their CI in accordance with values and ways of thinking relevant to their expectation of CE. This would be the outcome of the bonding of students’ CI and CE to the goals of citizenship education in schools.

The IEA Octagon model indicates that civic engagement unfolds within societal discourses that imply construction of CI (Torney-Purta *et al.*, 2001). However, there is an ecological system of human civic development that is multilevel in nature and has been proposed by Urie Bronfenbrenner to describe how students relate with their multicultural contexts (Bronfenbrenner, 1979). Ratner (1991) argued that although Bronfenbrenner’s model has been widely valued for

including many societal influences or layers in relation to individual student, it gives the misleading impression that these social layers are outside the student and not related to each other. Thus, he proposed a modified depiction of Bronfenbrenner's basic point in which the layers are pictured as interpenetrating and illustrated how the macrosystem passes through an individual student's mesosystems and microsystems and how the impacts of all these systems influence the CI development of an individual student (see **Figure 1**).

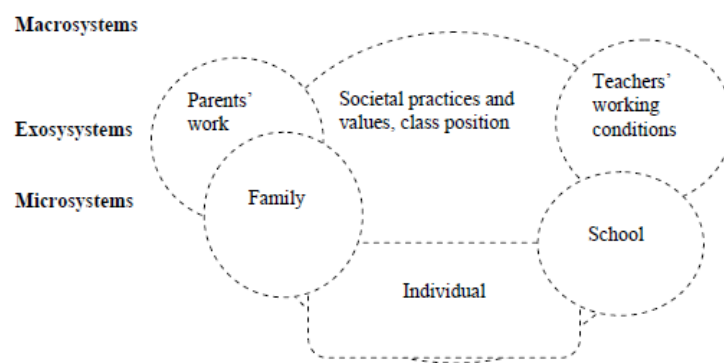


Figure 1. Diagram depicting social relations of individual (Ratner, 1991)

In a similar vein, Ferdman (2000) argued that the construction of CI should be studied in a framework of specific multicultural realities. In effect, ethnic minorities create unique civic identities (Banks, 2008). Ferdman defined the task as not only asking “who am I?” but also “why am I who I am”? This point is important because it helps to clarify how EM students make sense of themselves in the way they do. In other words, why did they come to have the CI that they do? In what ways do those students' place in a school influence the way they make sense of their CI?

As noted throughout the literature review, the technological innovation of online social media platform has the potential to make a significant contribution to social activism. Addressing the limits of what could and should be expected from technology can also help to better understand why and how cyberspace and cyberactivism may, under specific circumstances of Hong Kong, be seen as an important source of civic engagement and collective consciousness of civic identity. It is abundantly clear that online participation has changed and is changing Hong Kong as it has altered the world's social and political landscape. Such contexts demonstrate that despite the fact digital media have not replaced face-to-face interaction, they have opened up new opportunities for much more direct and robust communication.

Therefore, modern online social media has profoundly altered the social contexts of Hong Kong, allowing newer movements to penetrate deeply into the social fabric and mobilize new actors to become involved in social movements. On the other hand, there is little available evidence to suggest that the growing use of social media in Hong Kong has influenced ethnic minorities. By providing effective

tools for reaching large numbers of people including ethnic minorities, online social media has amplified the impact of connectedness, fostering social movement of staggering magnitude throughout the territories in Hong Kong.

III. Aims of the Study

After reviewing the literatures, the study aims to investigate whether EM students form part of the “keyboard warrior” culture for citizenship participation in Hong Kong. Although there are a number of literatures relating to local Chinese students, there is limited research that has been done to explore the relationships between online participation, civic identity and civic engagement of EM students in Hong Kong. Hence, there is important research gap about these relationships for Hong Kong EM students. Therefore, the following research hypotheses and questions were conceptualized to explore Hong Kong ethnic minority students’ civic identity (CI), online participation (OP) and citizenship engagement (CE). The research questions are:

H1: There are positive mediating effects of minoritized students’ online participation on their relationship between civic identity and engagement;
and

H2: There are positive mediating effects of minoritized students’ civic identity on their relationship between online participation and civic engagement

IV. Methods

The study used quantitative method to study the relationship between OP, CI and CE of Hong Kong EM students’ in the secondary schools. Quantitative method had been applied to examine the ways of EM students’ views about the OP, CI and CE.

A. Participants and Sampling

The target population will be EM students in the Form 1 to 6 classes of selected secondary schools in Hong Kong. Hong Kong EM students are defined as a group of students who belong to different ethnic groups which form a small proportion of population in Hong Kong. The purposeful stratified method was applied as sampling strategy to collect data from secondary school with high proportion of EM students. For sampling at least 500 students for a target sample size, schools in different districts had be recruited for sampling EM students. The letter of consent had been sent to all participating schools before the main questionnaire survey began.

B. Measures

The questions of OP, CI and CE are designed for Hong Kong's context. Likert scale of five-point with the range of 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree are adopted to measure all dimensions. The validated measures of OP, CI and CE are indicated as follows:

Online Participation:

EM student's "Perception of OP" is measured by (i) I think online participation is an effective way to make a change to something I believe to be unfair or unjust; (ii) I think online participation is an effective way to engage with civic issues; (iii) I think online participation promotes offline civic engagement; (iv) I am more civically engaged when I am online than offline; (v) I use the internet in order to participate in social movement or protest; (vi) I express my opinions online with regard to civic issues; (vii) I participate in the discussion of civic issues in social networking sites/apps (Cronbach's $\alpha = .86$).

"OP through online social media platform" is assessed by (i) I can be very effective using social network sites/apps like Snapchat QQ, Wechat, Whatsapp, Twitter, or Facebook to connect and communicate with others; (ii) I enjoy communicating with others online; (iii) I enjoy collaborating with others online more than I do offline; (iv) I post original messages, audio, pictures, or videos to express my feelings/thoughts/ ideas/ opinions on the Internet (Cronbach's $\alpha = .88$).

"Civic awareness through OP" is measured by (i) I can use the Internet to search information I need; (ii) I can use the Internet to find and download applications (apps) that are useful to me; (iii) I am more informed with regard to civic issues through the Internet; (iv) I am more aware of civic issues through the Internet; (v) I think I am given to rethink my beliefs regarding a particular civic issue/topic when I use the Internet; (vi) I agree the freedom of using internet and social networks should be supported in schools; (vii) I believe that internet can enhance democracy (Cronbach's $\alpha = .93$).

For further addressing the research questions of CI and CE through OP for EM students, a subset of some items are taken from the International Civic and Citizenship Education Study (ICCS) (Schulz *et al.*, 2010) and adapted for the current study. These measures are consisted of thirteen items on CI and twelve items on CE.

Civic Identity:

EM student's CI of "Hong Kong First" is assessed using seven items indicated in Appendix B. In addition, EM student's CI of "Emotional Attachment to Hong Kong" is assessed using six questions shown in Appendix I. Reliability test showed that Cronbach's α of these two dimensions was .82 and .72 respectively).

Civic Engagement:

CE is measured using items of “CE at School” and “CE in the Community”. Respondents are asked to rate the extent of their agreement for “CE at School” with six statements indicated in Appendix B. For “CE in the Community”, EM students are also asked to rate the extent of their agreement with six statements shown in Appendix I. Reliability test indicates that Cronbach’s α of these two dimensions is .78 and .83 respectively.

Demography:

These measures including gender, age, education, ethnicity, identity, and use of computer/mobile phone/internet are used to assess different demographic backgrounds and digital divide of EM students (Appendix I). Thus, the measures of survey instrument are validated for the research to examine how OP constructs relate to other variables of CI and CE. Then, the validated questionnaire for assessing OP, CI and CE constructs across the EM schools will be applied for data collection in the main study (Appendix II).

C. Analysis

Firstly, the correlation coefficient between the dimensions was firstly analyzed to understand the relationship between the variables. Secondly, Confirmatory Factor Analysis (CFA) will also be conducted to analyze the data in order to know the goodness of fit and internal consistency of the questionnaire. Thirdly, mediation structural equation models (SEM) were estimated for the latent variables and their interaction in order to understand the complex relationship between OP, CI, and CE. The mediation SEM of CE on CI and OP is specified in Figure 2.

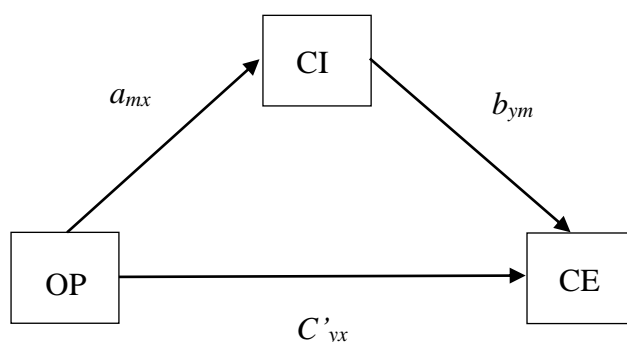


Figure 2. Pathway of mediation

For identifying the model’s parameters, the following common notations were applied with regression coefficients to indicate the relationship. The subscripts, a_{mx} is 1st path in a mediation relationship of OP and CI; b_{ym} is 2nd path in a mediation relationship of CI and CE; c'_{yx} is total effect of OP on CE by controlling

for CI . The subscripts were also used to indicate the OP , CI and CE associated with regression coefficients. The mediation effect of CI on “ OP and CE ” was shown in equations as follows:

$$CI_i = V_m + a_{mx}OP_i + \epsilon_{m,i} \quad (\text{eq 1})$$

$$CE_i = V_y + b_{ym}CI_i + C'_{yx}OP_i + \epsilon_{y,i} \quad (\text{eq 2})$$

When eq 1 was substituted into eq 2, the indirect effect of CI was shown as below:

$$CE_i = V_y + b_{ym}(V_m + a_{mx}OP_i + \epsilon_{m,i}) + C'_{yx}OP_i + \epsilon_{y,i} \quad (\text{eq 3})$$

Then, eq 3 was regrouped to follow the structure of regression equation:

$$CE_i = (V_y + b_{ym}V_m) + (a_{mx}b_{ym} + C'_{yx})OP_i + b_{ym}\epsilon_{m,i} + \epsilon_{y,i} \quad (\text{eq 4})$$

where:

- (i) $(V_y + b_{ym}V_m)$ - intercept
- (ii) $(a_{mx}b_{ym} + C'_{yx})$ - total effect of OP_i
- (iii) $a_{mx}b_{ym}$ - indirect effect of OP_i
- (iv) C'_{yx} - direct effect of OP_i
- (v) $b_{ym}\epsilon_{m,i}$ - direct effect of CI_i

The statistical significance of $a_{mx}b_{ym}$ was examined to test for mediation effect (Baron & Kenny, 1986). Before undertaking statistical data analyses, Bayesian plausible values (PVs) were computed for the data to avoid any uncertainty arising from the interactions between latent (*i.e.* exogenous) variables that depend on the observed (*i.e.* endogenous) variables of online participation, civic engagement and identity. Five sets of plausible values ($K=5$) were imputed for each response. Therefore, the parameter will be estimated five times when all of the five set of plausible values are used (Asparouhov and Muthen, 2010).

VI. Results

Since there were 748 students participating in the study that included 315 local students from the secondary schools, 14 EM students from the community centres, and 419 EM students from the secondary schools. The sample of 419 EM

students (229 male and 188 female, 2 gender unreported) with different religious backgrounds was selected to be analyzed in the study. Less than half (40.8%) of the students reported studying at non-religious schools and the other 59.2% reported studying at religious schools. More than half of the participants (54.9%) were boys and less than half (45.1%) were girls. Less than two-third (61.5%) and more than one-third (38.5%) of the respondents were in the age range of 11-15 and 16-20 respectively. About half (51.1%) were studying in Form 1-3, and the other half (48.9%) were in Form 4-6.

The students reported different ethnic minority backgrounds consisting of Indian/Nepalese/Pakistan (60.9%) and Filipino/Indonesian/Other Asian/White/Mixed (39.1%). Less than one-third of the participants identified themselves as ethnic minority (28.7%), more than one-third self-rated them as Hong Kong ethnic minority (38.4%) and the remaining one-third classified themselves as Hong Kong people (32.9%). They also reported their years of using Internet in the timeframe of below 5 years (34.1%), 5-10 years (36.6%) and over 10 years (29.3) (See **Table 1**).

Table 1. Sample Characteristics

Categories	Frequency	Valid Percent	Mean	S.D.
School Background			0.590	0.492
Non-religious	171	40.8		
Religious	248	59.2		
Gender			0.450	0.498
Boy	229	54.9		
Girl	188	45.1		
Age Group			0.390	0.487
11-15	236	61.5		
16-20	148	38.5		
Level of Education			0.490	0.500
Form 1 to 3	214	51.1		
Form 4 to 6	205	48.9		
Ethnicity			0.390	0.489
Indian/Nepalese/Pakistan	255	60.9		
Filipino/Indonesian/ Other Asian/White/Mixed	164	39.1		
Identity			1.04	0.785
Ethnic Minority	104	28.7		
Hong Kong Ethnic Minority	139	38.4		
Hong Kong People	119	32.9		
Years Using Internet			0.95	0.796
Below 5 years	141	34.1		
5-10 years	151	36.6		
Over 10 years	121	29.3		

Descriptive statistics and bivariate correlations between all latent variables of online participation, civic identity and engagement are reported in **Table 2**. Mean

and standard deviation (SD) reported for latent variables are estimated using “raw scale scores”. The respondents reported slightly higher positive self-efficacy for online participation (M = 3.915; SD = 0.612) and perception of Hong Kong environment (M = 3.710; SD = 3.710). They also reported positively on civic awareness of online participation (M = 3.312; SD = 0.628), perception of Hong Kong people (M = 3.150; SD = 0.690), and civic engagement in school (M = 3.130; SD = 0.765). The civic activism of online participation (M = 2.961; SD = 0.913) and civic engagement in community (M = 2.971; SD = 0.767) were reported to be somewhere in between slightly disagree and slightly agree.

Table 2

Descriptive Statistics and Correlations for Latent Constructs

Latent Variables	Mean	SD	n	op1	op2	op3	ci1	ci2	ce1
Civic Awareness of OP (op1)	3.312	0.628	380	1					
Civic Activism of OP (op2)	2.961	0.913	407	.857**	1				
Perceived self-efficacy of OP (op3)	3.915	0.612	401	.766**	.476**	1			
Perception of Hong Kong (ci1)	3.710	0.797	392	.431**	.355**	.467**	1		
Perception of Hong Kong People (ci2)	3.150	0.690	391	.595**	.618**	.335**	.794**	1	
Civic Engagement in Community (ce1)	2.971	0.767	399	.773**	.907**	.337**	.405**	.694**	1
Civic Engagement in School (ce2)	3.130	0.765	386	.802**	.759**	.501**	.396**	.599**	.881**

Note: Mean and SD reported for latent variables are estimated using “Raw Scale Scores”.

Correlation between latent variables reported is Pearson correlation using PVs (n = 419); **p < 0.001 level (2-tailed).

Correlation between latent variables reported is Pearson correlation using PVs. Overall, all those dimensions were positively interrelated. Regarding online participation (OP) dimensions, civic awareness of OP was highly positive correlated to dimension of civic engagement in community (r = .773, p < 0.001), civic engagement in school (r = .802, p < 0.001), and perception of Hong Kong people (r = .595, p < 0.001). In addition, civic activism of OP was also highly positive correlated to dimension of civic engagement in community (r = .907, p < 0.001), civic engagement in school (r = .759, p < 0.001), and perception of Hong Kong people (r = .618, p < 0.001). Regarding the relations between civic engagement and civic identity, correlations show that there was a slightly higher significant relation between perception of Hong Kong people and civic engagement in community (r = .694, p < 0.001) and in school (r = .599, p < 0.001) This meant the correlations were higher for online participation and civic engagement.

The measurement model was analyzed by confirmatory factor analysis (CFA) to investigate construct validity by testing the fit for whether the observed variables $u_1, u_2, \dots, u_{42}, u_{43}$ behave as hypothesized in relation to the latent variables $OP_{1,\dots}, CI_{1,\dots}, CE_1$ and the degree of measurement error in each observed variable. At the same time, CFA permits a diagnosis of the level of correlation between different latent factors by taking measurement error into account, and attempt to reduce the number of observed variables into latent factors. **Figure 3** illustrates

the fitted fundamental measurement model in which rectangles represent directly measured (i.e. observed) variables $u_3, u_8, \dots, u_{33}, u_{43}$ and circles indicating latent (i.e. unobserved) variables $OP_1, \dots, CI_1, \dots, CE_1$ that are defined by observed variables. Theoretically, the fitted measurement model can be expressed as a system of equations with statistical notation indicated as follows:

$$u_3 = \lambda_1 OP_1 + \delta_1$$

$$u_8 = \lambda_2 OP_1 + \delta_2$$

...

$$u_4 = \lambda_{18} CI_1 + \varphi_1$$

$$u_{10} = \lambda_{19} CI_1 + \varphi_2$$

...

$$u_{33} = \lambda_{39} CE_1 + \varepsilon_2$$

$$u_{43} = \lambda_{40} CE_1 + \varepsilon_3$$

where:

(i) $u_3, u_8, \dots, u_4, u_{10}, \dots, u_{33}, u_{43}$ are observed variables

(ii) $OP_1, \dots, CI_1, \dots, CE_1$ are latent variables

(iii) $\lambda_1, \lambda_2, \dots, \lambda_{18}, \lambda_{19}, \dots, \lambda_{39}, \lambda_{40}$ are factor loadings

(iv) $\delta_1, \delta_2, \dots, \varphi_1, \varphi_2, \dots, \varepsilon_2, \varepsilon_3$ are error terms

As shown in above equations, the relationships between the observed variables $u_3, u_8, \dots, u_{33}, u_{43}$ and latent variables $OP_1, \dots, CI_1, \dots, CE_1$, and the correlation between the latent variables can be estimated by CFA. In **Figure 3**, the arrows point to the observed variables $u_3, u_8, \dots, u_{33}, \dots, u_{43}$ which are considered as dependent variables. Moreover, in order to identify the measurement model with latent and observed variables on the same statistical scale, the factor loadings for $\lambda_1, \lambda_2, \dots, \lambda_{39}, \lambda_{40}$ and the error terms $\delta_1, \delta_2, \dots, \varepsilon_2, \varepsilon_3$ for the latent variable are set to 1. The fundamental model can be written in matrix form:

$$\mathbf{x} = \mathbf{\Lambda}_x OP_1 + \boldsymbol{\delta}$$

...

$$\mathbf{y} = \mathbf{\Lambda}_y CI_1 + \boldsymbol{\varphi}$$

...

$$\mathbf{z} = \mathbf{\Lambda}_z CE_1 +$$

...

where:

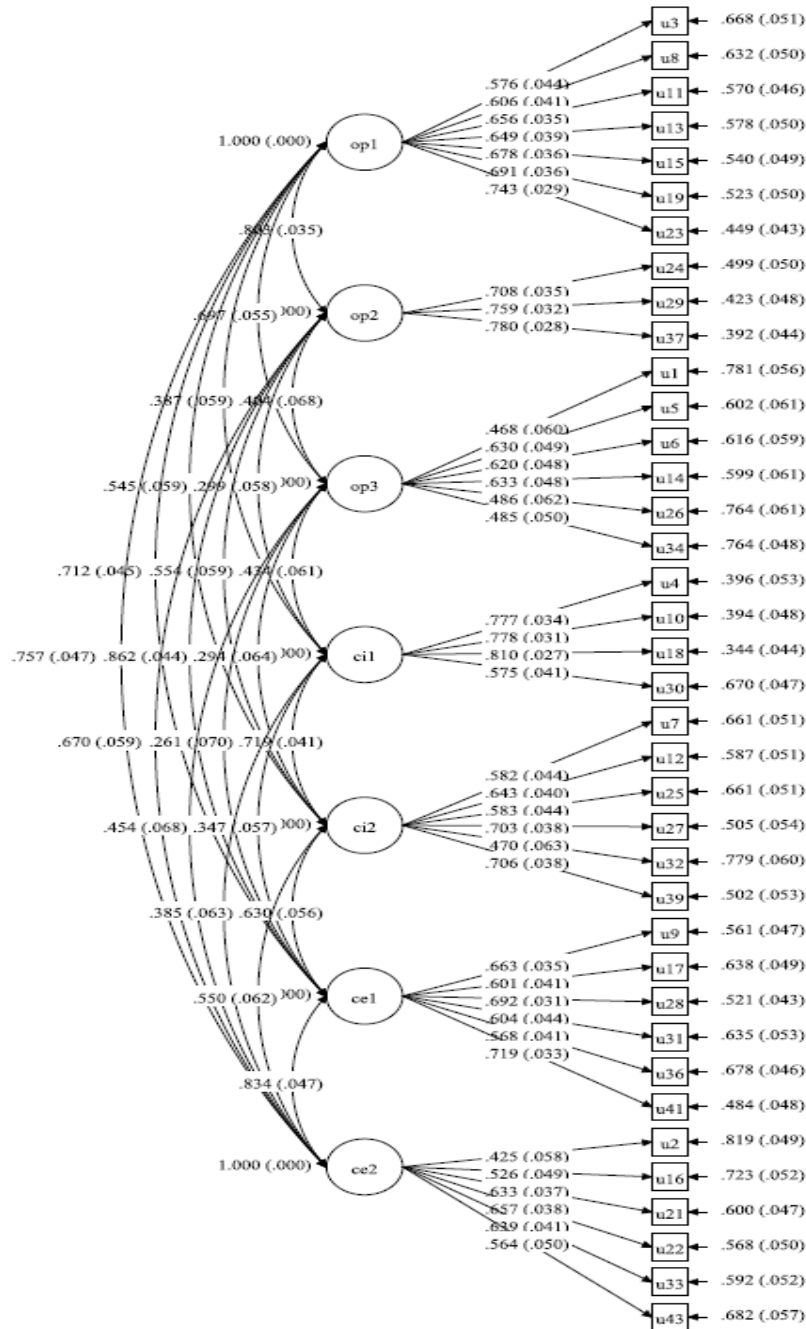
(i) $\mathbf{x}, \dots, \mathbf{z}$ is the matrix of observed variable

(ii) $\mathbf{\Lambda}_x, \dots, \mathbf{\Lambda}_z$ is the matrix of factor loading of latent variable

(iii) $\boldsymbol{\delta}, \dots, \boldsymbol{\varepsilon}$ is the matrix of error terms

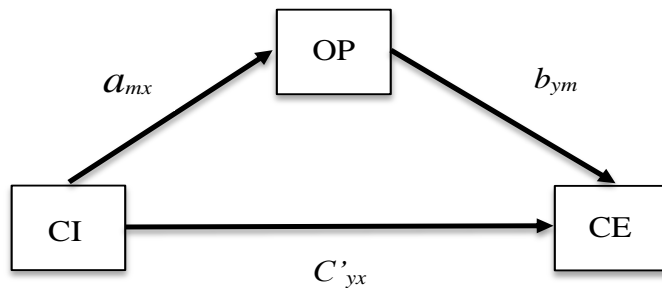
The CFA results showed that the seven-factor model assuming seven correlated latent variables, representing $OP_{1,..}, CI_{1,..}, CE_{1,..}$, had good overall model fit statistic ($\chi^2 = 1357.046, df = 681, p > 0.05$) and satisfactory parsimonious indices (RMSEA = .049). Standardized factor loadings in the seven-factor model ranged from .467 to .810 (all factor loadings are shown in **Figure 3**). These results indicated that the measurement model had good construct validity with satisfactory goodness-of-fit and parsimonious indices.

Figure 3. The Fitted Measurement Model



$[\chi^2 = 1357.046, df = 681, p > 0.05; RMSEA = 0.49]$

In order to test the H1 and H2 hypothesis, the mediation SEM is the first structural model to be built for model selection. Using *Mplus* 8.3, there are 12 mediation models being fitted using a mediation pathway for each dimension $OP_{1,..}, CI_{1,..}, CE_{1}$ (Figure 4).



Model	Indirect Effect	Direct Effect
1	CI1→OP1→CE1	CI1→CE1
2	CI1→OP1→CE2	CI1→CE2
3	CI1→OP2→CE1	CI1→CE1
4	CI1→OP2→CE2	CI1→CE2
5	CI1→OP3→CE1	CI1→CE1
6	CI1→OP3→CE2	CI1→CE2
7	CI2→OP1→CE1	CI2→CE1
8	CI2→OP1→CE2	CI2→CE2
9	CI2→OP2→CE1	CI2→CE1
10	CI2→OP2→CE2	CI2→CE2
11	CI2→OP3→CE1	CI2→CE1
12	CI2→OP3→CE2	CI2→CE2

Figure 4. Mediation Model 1-12 (OP is mediator between CI and CE, and CI is the confounder of OP and CE)

Within the path mediation model, a_{mx} is the 1st pathway existing among mediation relation between CI and OP, and b_{ym} is the 2nd pathway in a mediation relation of CE and OP. The product term of $a_{mx} \times b_{ym}$ is the indirect effect of CI on CE via OP, and c'_{yx} is direct effect of CI on CE without controlling for CE. The standardized regression coefficients of the fitted models 1-12 are indicated in **Table 3** and **4**.

The mediation model fit involves latent variables' interaction between predictor and mediator. The robust maximum likelihood (MLR) is applied to correct for non-normality of errors and heteroscedasticity due to small sample size (Nevitt & Hancock, 2004; Yuan & Bentler, 2000). Actually, MLR parameter estimates are the same as *maximum likelihood* (ML) using bootstrap that influences only standard

errors (SEs). Hence, the typical fit indices such as the χ^2 statistics, TLI, CFI and RMSEA based on normal probability distribution theory may not be sufficient for model evaluation of non-normal sampling distributions, such as for indirect effects and variances, particularly for such small samples (n=419).

Akaike Information Criterion (AIC)² and Bayesian Information Criterion (BIC)³ are more appropriate for evaluation of mediation models with latent variable interaction (Akaike, 1974; Findley, 1991). As per the criteria of model evaluation, the AIC is better than the BIC for assessing mediation (Vandenberg & Grelle, 2009). The smaller the AIC, the less information is lost by inclusion of the interaction terms (Burnham & Anderson, 2002). As shown in **Table 3-6**, Models 8, 12, 20 and 24 were relatively complex mediation models with inclusion of more parameters fitted for testing the hypothesis. By assessing the criteria of the AIC, BIC, the models were ranked in order of Model 3 > 4 > 9 > 10 > 5 > 1 > 6 > 2 > 11 > 7 > 12 > 8. Finally, Model 2, 4, 6, 7, 9, 16, 18, 19, 21, and 22 were selected for constructing mediation SEM models and further statistical data analysis was conducted according to the fitted indices.

In addition, there are eight “complementary mediations” including **Model 2, 4, 6, 7-10, and 12** in which the indirect effect $a_{mx} b_{ym}$ and direct effect C'_{yx} both exist and point to the same direction suggesting the test results are sufficient. In addition, there are two “Indirect-only mediations” such as Model 1 and 3 that the indirect effect $a_{mx} b_{ym}$ exists, but no direct effect, which is usually not hypothesized. Also, there are two “direct-only non-mediation” such as Model 5 and 11 with only direct effect C'_{yx} existing, but no indirect effect that indicates lack of mediation (Zhao et al., 2010). Hypothesis H1 predicted that EM students’ online participation is a mediator reinforcing a positive relationship between civic identity and engagement. Based on the results, H1 is supported by complementary mediation models 2, 8, 9, and 10, and indirect-only mediation models 1 and 3. The results of mediation **Model 2** showed, “OP1: Civic awareness through online participation” is significantly related to “CE2: Civic engagement at school” ($b_{ym} = .714$, $SE = .059$, $p < .001$), and in turn is positively influenced by “CI1: Perception and sense towards Hong Kong” ($a_{mx} = .387$, $SE = .059$, $p < .001$). The indirect effect of CI1 on CE2 ($a_{mx} b_{ym} = 0.276$, $p < .001$) is relatively stronger than its direct effect ($C'_{yx} = 0.115$, $p < .001$) which support H1.

² AIC = $-2 \ln f(y|\theta^{\wedge}) + 2k$, where “2k” is model complexity

³ BIC = $-2 \ln f(y|\theta^{\wedge}) + k \ln(n)$, where “k ln(n)” is model complexity that is heavier penalty term to penalize the model than AIC.

Table 3. Mediation Models 1-6 (OP is the mediator reinforcing the relationship between CI and CE)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Chi-square	236.211	223.062	143.042	129.966	260.746	221.700
Degree of freedom	116	116	62	62	101	101
p-value	>.05	>.05	>.05	>.05	>.05	>.05
Log likelihood	-8666.622	-8938.792	-6880.073	-7228.357	-8521.036	-8784.296
Estimated paths ⁽ⁱ⁾	54	54	42	42	51	51
RMSEA	0.050	0.047	0.056	0.051	0.061	0.053
CFI	0.940	0.942	0.949	0.948	0.897	0.911
TLI	0.929	0.932	0.935	0.935	0.877	0.894
SRMR	0.049	0.048	0.053	0.051	0.065	0.054
AIC ⁽ⁱⁱ⁾	17441.243 ⁶	17985.584 ⁸	13844.146 ¹	14540.715 ²	17144.072 ⁵	17670.591 ⁷
BIC ⁽ⁱⁱⁱ⁾	17659.288 ⁶	18203.629 ⁸	14013.736 ¹	14710.305 ²	17350.004 ⁵	17876.523 ⁷
CI1→OP1 (a_{mx})	0.388***	0.387***				
CI1→OP2 (a_{mx})			0.343***	0.304***		
CI1→OP3 (a_{mx})					0.435***	0.436***
OP1→CE1 (b_{ym})	0.681***					
OP1→CE2 (b_{ym})		0.714***				
OP2→CE1 (b_{ym})			0.865***			
OP2→CE2 (b_{ym})				0.610***		
OP3→CE1 (b_{ym})					0.128(ns)	
OP3→CE2 (b_{ym})						0.353***
CI1→CE1 (C'_{yx})	0.083 (ns)		0.004(ns)		0.295***	
CI1→CE2 (C'_{yx})		0.115***		0.206**		0.244***
R ² on OP	0.151**	0.150**	0.118**	0.092**	0.189***	0.190***
R ² on CE	0.515***	0.586***	0.751***	0.491***	0.136**	0.260***
Ind Effect ($a_{mx} b_{ym}$)	0.264***	0.276***	0.297***	0.185***	0.056(ns)	0.154***
Dir Effect (C'_{yx})	0.083(ns)	0.115***	0.004(ns)	0.206**	0.295***	0.244***
Total Effect	0.347***	0.391***	0.301***	0.391***	0.351***	0.398***

Note: $n = 419$. (i) Estimated paths is equivalent to model's no. of free parameters; (ii) Akaike information criterion is ranked in order; (iii) Bayesian information criterion is ranked in order; All the coefficients are standardized; ns = non-significant; *** $p < .001$, ** $p < .01$, * $p < .05$

Thereafter, H1 is justified by **Model 9** where “OP1: Civic awareness through online participation” played a highly significant mediating role between “CI2: Perception towards Hong Kong people” ($a_{mx} = .561$, SE = .058, $p < .001$) and “CE1: Civic engagement in the community” ($b_{ym} = .748$, SE = .069, $p < .001$) because the indirect effect of CI2 on CE1 ($a_{mx} b_{ym} = 0.420$, $p < .001$) is stronger than its direct effect ($C'_{yx} = 0.211$, $p < .001$). H1, however, is confirmed in the mediation path of models 4, 6, and 7. In **Model 4**, the mediation results indicated that “OP2: Civic activism of online participation” (such as using the Internet to join in protest or social movement, express their opinions about civic issues online, and discuss civic issues in social networking apps/sites) positively mediated the relationship between “CI1: Perception and sense towards Hong Kong” ($a_{mx} = .304$, SE = .058, $p < .001$) and “CE2: Civic engagement at school” ($b_{ym} = .610$, SE = .067, $p < .001$). But, the indirect effect of CI1 on CE2 ($a_{mx} b_{ym} = 0.185$, $p < .001$) was less than its direct effect ($C'_{yx} = 0.206$, $p < .01$).

Table 4. Mediation Models 7-12 (OP is the mediator reinforcing the relationship between CI and CE)

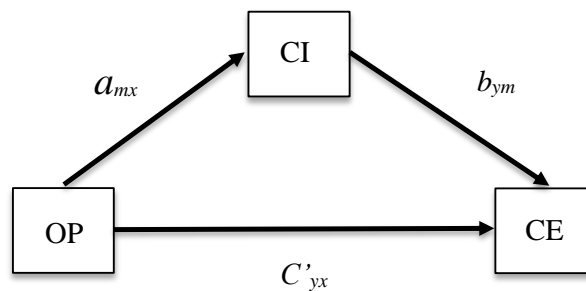
	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Chi-square	317.138	304.155	204.195	193.308	304.920	281.312
Degree of freedom	149	149	87	87	132	132
p-value	>.05	>.05	>.05	>.05	>.05	>.05
Log likelihood	-9809.874	-10099.036	-8020.356	-8379.979	-9681.057	-9966.488
Estimated paths ⁽ⁱ⁾	60	60	48	48	57	57
RMSEA	0.052	0.050	0.057	0.054	0.056	0.052
CFI	0.917	0.916	0.925	0.920	0.888	0.890
TLI	0.904	0.904	0.910	0.903	0.870	0.872
SRMR	0.052	0.052	0.052	0.052	0.064	0.056
AIC ⁽ⁱⁱ⁾	19739.747 ^{1c}	20318.071 ^{1c}	16136.713 ³	16855.958 ⁴	19476.114 ⁹	20046.977 ¹
BIC ⁽ⁱⁱⁱ⁾	19982.019 ^{1c}	20560.344 ¹	16330.531 ³	17049.776 ⁴	19706.273 ⁵	20277.135 ¹¹
CI2→OP1 (a_{mx})	0.546***	0.546***				
CI2→OP2 (a_{mx})			0.561***	0.561***		
CI2→OP3 (a_{mx})					0.287***	0.289***
OP1→CE1 (b_{ym})	0.526***					
OP1→CE2 (b_{ym})		0.657***				
OP2→CE1 (b_{ym})			0.748***			
OP2→CE2 (b_{ym})				0.532***		
OP3→CE1 (b_{ym})					0.087(ns)	
OP3→CE2 (b_{ym})						0.326***
CI2→CE1 (C'_{yx})	0.346***		0.211***		0.609***	
CI2→CE2 (C'_{yx})		0.187*		0.253**		0.452***
R ² on OP	0.298***	0.298***	0.315***	0.315***	0.083***	0.083***
R ² on CE	0.594***	0.601***	0.781***	0.498***	0.410***	0.396***
Ind Effect ($a_{mx}b_{ym}$)	0.287***	0.359***	0.420***	0.298***	0.175(ns)	0.094***
Dir Effect (C'_{yx})	0.346***	0.187***	0.211***	0.253***	0.609***	0.452***
Total Effect	0.633***	0.546***	0.631***	0.551***	0.784***	0.546***

Note: $n = 419$. (i) Estimated paths is equivalent to model's no. of free parameters; (ii) Akaike information criterion is ranked in order; (iii) Bayesian information criterion is ranked in order; All the coefficients are standardizes; ns = non- significant; *** $p < .001$, ** $p < .01$, * $p < .05$

Moreover, H1 is supported by **Model 6** where “OP3: Perceived self-efficacy of online participation” to look for information, search/download useful apps to connect and communicate with others, and to express opinions/ideas/ thoughts/ feelings online positively mediated the relationship between “CI1: Perception and sense towards Hong Kong” ($a_{mx} = .436$, $SE = .060$, $p < .001$) and “CE2: Civic engagement at school” ($b_{ym} = .353$, $SE = .084$, $p < .001$) although the indirect effect of CI1 on CE2 ($a_{mx}b_{ym} = 0.154$, $p < .001$) was weaker than its direct effect ($C'_{yx} = 0.244$, $p < .001$). H1 is also affirmed by the mediation results of **Model 7** that indicated “OP1: Civic awareness through online participation” is positively associated with “CE1: Civic engagement in community” ($b_{ym} = .526$, $SE = .068$, $p < .001$), and is successively affected by “CI2: Perception and identification towards Hong Kong people” ($a_{mx} = .546$, $SE = .060$, $p < .001$) with the indirect effect of CI2 on CE1 ($a_{mx}b_{ym} = 0.287$, $p < .001$).

In essence, H1 is confirmed by four “complementary mediation” models 2, 8, 9 and 10, and two “indirect-only mediation” models 1 and 3 that the EM students' civic

awareness and activism through online participation has played a mediating role to support their existing interest in civic events and reinforces their civic identity and engagement. *Civic awareness through online participation* reinforces the relationship between their *perception and sense towards Hong Kong* and *civic engagement at school*. Civic activism through online participation also reinforces the relationship between their *perception and identification towards Hong Kong people* and their *civic engagement in community*. Conversely, H1 is supported by four “complementary mediation” models 4, 6, 7 and 12 although the indirect effect is *weaker* than the direct effects that the EM students’ online participation is considered to have *weak mediating effect* for shaping their civic identity and engagement. Lastly, H1 is rejected by two “direct-only non-mediation” models 5 and 11. Another theoretical focus of this research is on civic identity, with the expectation that identity is a pre-requisite condition of online participation and civic engagement. This study, therefore, explored the roles of online participation as both reinforcing and stimulating civic identity and engagement. Against this background, Hypothesis H2 predicted that civic identity mediates the relationship between online participation and civic engagement. Hence, this study also explored whether EM students’ perception and sense towards Hong Kong, and their impression and feeling towards Hong Kong people mediates their online participation and civic engagement. Models 13-24 are another set of mediation models built for testing H2 in order to compare it with H1 (Figure 4.7).



Model	Indirect Effect	Direct Effect
13	OP ₁ → CI ₁ → CE ₁	OP ₁ → CE ₁
14	OP ₁ → CI ₁ → CE ₂	OP ₁ → CE ₂
15	OP ₂ → CI ₁ → CE ₁	OP ₂ → CE ₁
16	OP ₂ → CI ₁ → CE ₂	OP ₂ → CE ₂
17	OP ₃ → CI ₁ → CE ₁	OP ₃ → CE ₁
18	OP ₃ → CI ₁ → CE ₂	OP ₃ → CE ₂
19	OP ₁ → CI ₂ → CE ₁	OP ₁ → CE ₁
20	OP ₁ → CI ₂ → CE ₂	OP ₁ → CE ₂
21	OP ₂ → CI ₂ → CE ₁	OP ₂ → CE ₁
22	OP ₂ → CI ₂ → CE ₂	OP ₂ → CE ₂
23	OP ₃ → CI ₂ → CE ₁	OP ₃ → CE ₁
24	OP ₃ → CI ₂ → CE ₂	OP ₃ → CE ₂

Figure 4.7. Mediation Model 13-24 (CI is mediator reinforcing the relationship between CI and CE, and OP is the “stimulator” of CI and CE)

Within the pathway of mediation model, a_{mx} is 1st pathway existing in the mediation relation between OP and CE, and b_{ym} is 2nd pathway in the mediation relation between OP and CE. The product term of $a_{mx} \times b_{ym}$ is the indirect effect of OP on CE via CI, and c'_{yx} is direct effect of OP on CE without controlling for CI. The standardized regression coefficients of the fitted models 13-24 are indicated in **Table 5** and **Table 6**. Through evaluation of the AIC and BIC criteria, the mediation SEM models were put in the order of Model 15 > 16 > 21 > 22 > 17 > 13 > 18 > 14 > 23 > 19 > 24 > 20. As demonstrated in **Table 5** and **6**, there are seven “complementary mediations” including Model 16, 18, 19, 20, 21, 22, and 24 that both indirect effect $a_{mx} b_{ym}$ and direct effect C'_{yx} exist. In addition, the indirect effect is *weaker* than the direct effect. This suggests that the addition of civic identity as a mediator *slightly* increase the predictive power of online participation on civic engagement.

Table 5. Mediation Models 13-18(CI is the mediator reinforcing the relationship between OP and CE)

	Model 13	Model 14	Model 15	Model 16	Model 17	Model 18
Chi-square	236.211	223.062	143.042	129.966	260.746	221.700
Degree of freedom	116	116	62	62	101	101
p-value	>.05	>.05	>.05	>.05	>.05	>.05
Log likelihood	-8666.622	-8938.792	-6880.073	-7228.357	-8521.036	-8784.296
Estimated paths ⁽ⁱ⁾	54	54	42	42	51	51
RMSEA	0.050	0.047	0.056	0.051	0.061	0.053
CFI	0.940	0.942	0.949	0.948	0.897	0.911
TLI	0.929	0.932	0.935	0.935	0.877	0.894
SRMR	0.049	0.048	0.053	0.051	0.065	0.054
AIC ⁽ⁱⁱ⁾	17441.243 ⁶	17985.584 ^ξ	13844.146 ¹	14540.715 ²	17144.072 ⁵	17670.591 ⁷
BIC ⁽ⁱⁱⁱ⁾	17659.288 ^ξ	18203.629 ^ξ	14013.736 ¹	14710.305 ²	17350.004 ⁵	17876.523 ⁷
OP1→CI1 (a_{mx})	0.388***	0.387***				
OP2→CI1 (a_{mx})			0.343***	0.304***		
OP3→CI1 (a_{mx})					0.435***	0.436***
CI1→CE1 (C'_{yx})	0.083 (ns)		0.004(ns)		0.295***	
CI1→CE2 (C'_{yx})		0.115(ns)		0.206**		0.244**
OP1→CE1 (b_{ym})	0.681***					
OP1→CE2 (b_{ym})		0.714***				
OP2→CE1 (b_{ym})			0.865***			
OP2→CE2 (b_{ym})				0.610***		
OP3→CE1 (b_{ym})					0.128(ns)	
OP3→CE2 (b_{ym})						0.353***
R-square (CI)	0.151**	0.150**	0.118**	0.092**	0.189***	0.190***
R-square (CE)	0.515***	0.586***	0.751***	0.491***	0.136**	0.260***
Ind Effect ($a_{mx} b_{ym}$)	0.032(ns)	0.045(ns)	0.001(ns)	0.063***	0.128**	0.106***
Dir Effect (C'_{yx})	0.681***	0.714***	0.865***	0.610***	0.128(ns)	0.353***
Total Effect	0.713***	0.759***	0.866***	0.673***	0.256**	0.459***

Note: $n = 419$. (i) Estimated paths is equivalent to model's no. of free parameters; (ii) Akaike information criterion is ranked in order; (iii) Bayesian information criterion is ranked in order; All the coefficients are standardized; ns = non-significant; *** $p < .001$, ** $p < .01$, * $p < .05$

Table 6. Mediation Models 19-24(CI is the mediator reinforcing the relationship between OP and CE)

	Model 19	Model 20	Model 21	Model 22	Model 23	Model 24
Chi-square	317.138	304.155	204.195	193.308	304.920	281.312
Degree of freedom	149	149	87	87	132	132
p-value	>.05	>.05	>.05	>.05	>.05	>.05
Log likelihood	-9809.874	-10099.036	-8020.356	-8379.979	-9681.057	-9966.488
Estimated paths ⁽ⁱ⁾	60	60	48	48	57	57
RMSEA	0.052	0.050	0.057	0.054	0.056	0.052
CFI	0.917	0.916	0.925	0.920	0.888	0.890
TLI	0.904	0.904	0.910	0.903	0.870	0.872
SRMR	0.052	0.052	0.052	0.052	0.064	0.056
AIC ⁽ⁱⁱ⁾	19739.747 ¹ⁱ	20318.071 ¹ⁱ	16136.713 ³	16855.958 ⁴	19476.114 ⁹	20046.977 ¹
BIC ⁽ⁱⁱⁱ⁾	19982.019 ¹ⁱ	20560.344 ¹	16330.531 ³	17049.776 ⁴	19706.273 ⁵	20277.135 ¹¹
OP1→CI2 (a_{mx})	0.546***	0.546***				
OP2→CI2 (a_{mx})			0.561***	0.561***		
OP3→CI2 (a_{mx})					0.287***	0.289***
CI2→CE1 (C'_{yx})	0.346***		0.211**		0.609***	
CI2→CE2 (C'_{yx})		0.187*		0.253**		0.452***
OP1→CE1 (b_{ym})	0.526***					
OP1→CE2 (b_{ym})		0.657***				
OP2→CE1 (b_{ym})			0.748***			
OP2→CE2 (b_{ym})				0.532***		
OP3→CE1 (b_{ym})					0.087(ns)	
OP3→CE2 (b_{ym})						0.326***
R ² on CI	0.298***	0.298***	0.315***	0.315***	0.083*	0.083*
R ² on CE	0.594***	0.601***	0.781***	0.498***	0.410***	0.396***
Ind Effect ($a_{mx} b_{ym}$)	0.189***	0.102***	0.118***	0.142***	0.175***	0.131***
Dir Effect (C'_{yx})	0.526***	0.657***	0.748***	0.532***	0.087(ns)	0.326***
Total Effect	0.715***	0.759***	0.866***	0.674***	0.262***	0.457***

Note: n = 419. (i) Estimated paths is equivalent to model's no. of free parameters; (ii) Akaike information criterion is ranked in order; (iii) Bayesian information criterion is ranked in order; All the coefficients are standardized; ns = non- significant; *** p < .001, ** p < .01, * p < .05 (two-tailed)

On the other hand, there are two “indirect-only mediations” such as **Model 17** and **23** in which only the indirect effect $a_{mx} b_{ym}$ is significant. Moreover, there are three “direct-only non-mediation” such as **Model 13, 14** and **15** in which only the direct effect C'_{yx} is significant implying a lack of mediation (Zhao et al., 2010). The hypothesis H2 predicted that EM students’ civic identity is a mediator reinforcing a positive relationship between online participation and civic engagement. This relationship is reflected in the complementary mediation models. The results showed that H2 is significantly supported by these models as a result of mediation effect in which the direct effect of online participation was stronger than the indirect effect of civic identity.

H2 is confirmed in the mediation path of **Model 16**. The mediation results indicated that “CI1: Perception and sense towards Hong Kong” positively mediated the relationship between “OP2: Civic activism of online participation” such as using the Internet to join in protest or social movement, express their opinions about

civic issues online, and discuss civic issues in social networking apps/sites ($a_{mx} = .304$, $SE = .058$, $p < .001$) and “CE2: Civic engagement at school” ($b_{ym} = .206$, $SE = .063$, $p < .001$) although the indirect effect of OP2 on CE2 ($a_{mx} b_{ym} = 0.063$, $p < .001$) was weaker than its direct effect ($C'_{yx} = 0.610$, $p < .001$).

H2 is supported by **Model 18** where “CI1: Perception and sense towards Hong Kong” positively mediated the relationship between “OP3: Perceived self-efficacy of online participation” to look for information, search/download useful apps to connect and communicate with others, and to express opinions/ideas/ thoughts/ feelings online” ($a_{mx} = .436$, $SE = .060$, $p < .001$) and “CE2: Civic engagement at school” ($b_{ym} = .244$, $SE = .083$, $p < .001$) even though the indirect effect of OP3 on CE2 ($a_{mx} b_{ym} = 0.353$, $p < .001$) was smaller than its direct effect ($C'_{yx} = 0.106$, $p < .001$). In addition, H2 is also supported by the mediation results of **Model 19** which indicated “CI2: Perception and identification towards Hong Kong people” is positively associated with “CE1: Civic engagement in community” ($b_{ym} = .346$, $SE = .075$, $p < .001$), and is successively affected by “OP1: Civic awareness through online participation” ($a_{mx} = .546$, $SE = .060$, $p < .001$) since the indirect effect of OP1 on CE1 ($a_{mx} b_{ym} = 0.189$, $p < .001$) is less than its direct effect ($C'_{yx} = 0.526$, $p < .001$).

Furthermore, H2 is justified by **Model 21** in which “CI2: Perception and identification towards Hong Kong people” played a positive mediating role between “OP2: Civic activism of online participation” such as using the Internet to join in protest or social movement, express their opinions about civic issues online, and discuss civic issues in social networking apps/sites ($a_{mx} = .561$, $SE = .058$, $p < .001$) and “CE1: Civic engagement in the community” ($b_{ym} = .211$, $SE = .069$, $p < .001$) although its direct effect ($C'_{yx} = 0.748$, $p < .001$) is larger than the indirect effect ($a_{mx} b_{ym} = 0.118$, $p < .001$).

Likewise, H2 is then justified by **Model 22** in which CI2 is significantly related to “CE2: Civic engagement at school” ($b_{ym} = .253$, $SE = .083$, $p < .001$), and in turn is positively influenced by OP2 ($a_{mx} = .561$, $SE = .058$, $p < .001$). However, the indirect effect of CI1 on CE2 ($a_{mx} b_{ym} = 0.142$, $p < .001$) is still less than its direct effect ($C'_{yx} = 0.532$, $p < .001$). Therefore, the results showed that H2 is confirmed by two “indirect-only mediation” Models 17 and 23. H2 is supported by all “complementary mediation” Models 16, 18-22 and 24. H2 is just rejected by three “direct-only non-mediation” Models 13, 14 and 15.

In sum, Hypothesis H2 is consistently supported by seven “complementary mediation” models and two “indirect-only mediation” models for a positive relationship between OP and CE through CI although the mediating effect of CI is weak. On the contrary, hypothesis H1 is not sufficiently supported, and only confirmed by four “complementary mediation” models and two “indirect-only mediation” models for a positive relationship between CI and CE through OP. Hence, the H2 models are better than H1 models, and suggested that a moderation analysis can be used to explore the moderating effects of socio-demographic background variables on the relationship between its latent variables.

VII. Discussion

Hypothesis H1 examined a three variables' mediation model where the influence of EM students' civic identity (X) are assumed to be directly related to their civic engagement (Y) or indirectly related to their civic engagement (Y) via online participation (M). This addresses RQ1. The models 1-12 of hypothesis H1 proposed that online participation can *reinforce* the civic identity of inactive EM students to engage in civic activities. By noting the important role of civic identity in shaping EM students' civic engagement (Chan, 2013; Chor, 2019; Gitelman, 2006), hypothesis H1 focused on the mediating effects of online participation and provided empirical evidence whether or not EM students' civic identity has a positive impact on their civic engagement via their online participation.

As revealed by the results, hypothesis H1 was only justified by *four* complementary mediation models with *strong* indirect effects, and by another *four* complementary mediation models with *weak* indirect effects. For this reason, EM students' online participation was considered to have either *strong* or *weak mediating effect* for reinforcing the relationship between their civic identity and engagement (see **Table 7**). **Table 7** is modified from **Table 3** and **Table 4**. In addition, H1 was partially supported by *two* indirect-only mediation models without direct effect and also rejected by another *two* direct-only non-mediation models without indirect effect (**Table 7**). Therefore, the mediating (*i.e.* reinforcing) effect of online participation in the relationship between civic identity and engagement was *not consistently* identified in hypothesis H1.

The results of fitted statistics of R^2 in **Table 7** indicates the effect size of Models 1-12 in hypothesis H1 for the total mediated effect. The top three models with large effect sizes include complementary mediation **Models 9** ($R^2 = 0.781$), indirect-only mediation **Model 3** ($R^2 = 0.751$), and complementary mediation **Models 8** ($R^2 = 0.601$). The results have illustrated that civic identity positively influences civic engagement, and online participation has a positive mediating effect to *reinforce* EM students' positive perception toward Hong Kong with online civic news and information. The results suggest that EM students, who discuss civic issues on social networking apps/sites and express their opinions about civic issues online are those who were already interested in civic activities. In turn, their perceived engagement in the community is associated with their involvement in community organizations (e.g., youth alliance associated with a political group, environmental organization, artistic affiliation in accordance with ethnicity, religious organization or group, and concern group advocating for a civic matter).

Table 7. Type of Mediation Models 1-12 (Arranged in Descending Order of Effect Size)

Model	Indirect Effect	Ind Effect ($a_{mx} b_{ym}$)	Direct Effect	Dir Effect (C'_{yx})	Total Effect	Effect Size (R^2)	Type of Mediation
9	CI2→OP2→CE1	0.420***	CI2→CE1	0.211***	0.631***	0.781***	CM'
3	CI1→OP2→E1	0.297***	CI1→CE1	0.004(ns)	0.301***	0.751***	ID
8	CI2→OP1→CE2	0.359***	CI2→CE2	0.187***	0.546***	0.601***	CM'
7	CI2→OP1→CE1	0.287***	CI2→CE1	0.346***	0.633***	0.594***	CM
2	CI1→OP1→CE2	0.276***	CI1→CE2	0.115***	0.391***	0.586***	CM'
1	CI1→OP1→CE1	0.264***	CI1→CE1	0.083(ns)	0.347***	0.515***	ID
10	CI2→OP2→CE2	0.298***	CI2→CE2	0.253***	0.551***	0.498***	CM
4	CI1→OP2→CE2	0.185***	CI1→CE2	0.206**	0.391***	0.491***	CM
11	CI2→OP3→CE1	0.175(ns)	CI2→CE1	0.609***	0.784***	0.410***	DO
12	CI2→OP3→CE2	0.094***	CI2→CE2	0.452***	0.546***	0.396***	CM
6	CI1→OP3→CE2	0.154***	CI1→CE2	0.244***	0.398***	0.260***	CM
5	CI1→OP3→CE1	0.056(ns)	CI1→CE1	0.295***	0.351***	0.136**	DO

Note: CM: complementary mediation with strong direct effect; CM': complementary mediation with strong indirect effect; ID: indirect-only mediation; DO: direct-only mediation; All the coefficients are standardized; ns = non-significant; *** $p < .001$, ** $p < .01$, * $p < .05$

EM students participate online because their connections and networks in online social media platform are based on interpersonal relationships (Boyd & Ellison, 2007; Chen, 2017; Gil de Zuniga et al., 2010). Therefore, the complementary mediation **Model 9**, which accounts for 78.1% of the variance in civic engagement explained directly by “civic identity” and “civic identity via online participation”, argues that civic identity is directly related to civic engagement or indirectly related to civic engagement through online participation. This important finding suggests the centrality of civic identity in understanding any propensity for civic engagement for EM students and the importance of online participation as a process that can provide opportunities for them to realize the values underpinning their civic identity.

In addition, EM students whose civic identity influences their civic engagement are also more likely to have a favorable impression toward Hong Kong people. They perceive Hong Kong people to have values such as appreciating environmental protection, very friendly toward people, and more cohesive than people of other countries, etc. These favorable attitudes shape their civic interest as well as their awareness of civic issues about Hong Kong that promote their levels of civic engagement.

Hypothesis H2 addressed the research question RQ2 by showing the statistically significant mediated effect of civic identity (M) on the relationship between online participation (X) and civic engagement (Y). However, its mediation Models 13-24 have the same magnitude of “effect sizes” as its corresponding mediation Models 1-12 of hypothesis H1 (see **Table 7**) since the predictor (X) and mediator (M) of Models 1-12 have been symmetrically exchanged with each other in Model 13-24 (see **Table 8**). **Table 8** is modified from **Table 5-6**.

de Heus, P. (2012) indicated R² effect size is symmetric because both indirect and direct effect are interdependent so that the identical magnitude of these two effects in Models 1-12 and Models 13-24 give rise to the same amount of explained variance. As a result, the change in civic engagement (Y) because of the influence by predictor X is the same in both cases of Models 1-12 and Models 13-24. Thus, the change in civic engagement is all that matters for the variance explained, and it is plausible that the magnitude of variance explained should be identical in both cases.

Table 8

Type of Mediation Models 13-24 (Arranged in Descending Order of Effect Size)

Model	Indirect Effect	Ind Effect ($a_{mx} b_{ym}$)	Direct Effect	Dir Effect (C'_{yx})	Total Effect	Effect Size (R ²)	Type of Mediation
21	OP2→CI2→CE1	0.118***	OP2→CE1	0.748***	0.866***	0.781***	CM
15	OP2→CI1→CE1	0.001(ns)	OP2→CE1	0.865***	0.866***	0.751***	DO
20	OP1→CI2→CE2	0.102***	OP1→CE2	0.657***	0.759***	0.601***	CM
19	OP1→CI2→CE1	0.189***	OP1→CE1	0.526***	0.715***	0.594***	CM
14	OP1→CI1→CE2	0.045(ns)	OP1→CE2	0.714***	0.759***	0.586***	DO
13	OP1→CI1→CE1	0.032(ns)	OP1→CE1	0.681***	0.713***	0.515***	DO
22	OP2→CI2→CE2	0.142***	OP2→CE2	0.532***	0.674***	0.498***	CM
16	OP2→CI1→CE2	0.063***	OP2→CE2	0.610***	0.673***	0.491***	CM
23	OP3→CI2→CE1	0.175***	OP3→CE1	0.087(ns)	0.262***	0.410***	ID
24	OP3→CI2→CE2	0.131***	OP3→CE2	0.326***	0.457***	0.396***	CM
18	OP3→CI1→CE2	0.106***	OP3→CE2	0.353***	0.459***	0.260***	CM
17	OP3→CI1→CE1	0.128**	OP3→CE1	0.128(ns)	0.256**	0.136**	ID

Note: CM: complementary mediation with strong direct effect; CM': complementary mediation with strong indirect effect; ID: indirect-only mediation; DO: direct-only mediation; All the coefficients are standardized; ns = non-significant; *** $p < .001$, ** $p < .01$, * $p < .05$

As shown in **Table 8**, there were seven complementary mediation models that have both indirect effects $a_{mx} b_{ym}$ and direct effects C'_{yx} . Moreover, there were two indirect-only mediation models in which only the indirect effect $a_{mx} b_{ym}$ is significant, and three direct-only non-mediation model in which only the direct effect C'_{yx} was significant. This supports hypothesis H2 that EM students' online

participation exerts a strong *stimulating* effect on their civic identity and engagement. It is sufficiently supported by nine mediation models including complementary and indirect-only mediations.

As hypothesized, the findings support research question RQ2 that online participation contributes directly to civic engagement behaviors or indirectly via civic identity. Actually, a positive relationship between online participation and students' civic engagement behaviors has been consistently found in previous research. Online participation can be considered as an online social network in which students share equal status and opportunities to communicate with each other and exchange civic information. This network relationship between students is important for understanding the effect of civic identity on engagement in civic activity. In this relationship, online participation is best understood as a social network of ethnic groups and ties through which the students' interactions lead them into civic affairs (Gil de Zúñiga *et al.*, 2012). This social function of online participation should not be underestimated since it can unite disparate individuals creating common understandings and purposes. Alternatively, it might also have negative effects if exchanges take this character. This is an important area for additional consideration.

Some studies have shown that networks can promote civic engagement. Banks (2008) indicated that equivalent status among different ethnic groups is important for effective intergroup interactions and communication. Likewise, Putnam (1993) indicated that social networks must be organized horizontally among diversified groups in order for democracy to work. Engagement in different social groups provide a setting for civic interactions as well as a platform for addressing civic needs (Brennan *et al.* 2009). Vermeulen (2006) emphasized that network relationships between individuals from different ethnic groups give rise to democracy by promoting civic interest and trust in civic engagement. Moreover, there is creation of network relations on the grounds of online participation because it promotes interpersonal networks, strengthens interpersonal trust, provokes civic participation, and reinforces sense of belonging to the community among specific ethnic groups (Zaleskiene 2008).

Furthermore, Harris (2010) found that networks are one of the most important factors for cultivating civic connection. Hence, EM students are building networks for civic engagement through online participation because they may sense that formal civic processes may not respond to their needs. As they study in the schools which enhance their interactions with peers. This process serves as the emotional center of their lives as they change from their family units to spending time with others in the schools. Given the important role of networks in providing a means for communication between EM students, the study has also pointed towards additional factors that appear to facilitate civic engagement. The study showed that a positive perception of and identification towards Hong Kong people was a mediator of online participation and civic engagement, whereas

perception and identification toward Hong Kong people also mediated the relationship between online participation and civic engagement.

VIII. Conclusion

Overall, this study aims to address research questions relating to online participation and its influence on EM students' level of civic engagement. A number of hypothesized models were developed to provide empirical evidence for any identified relationships. Hypothesis H1 addressed the first research question by using a set of mediation models to test whether there were positive mediating effects of EM students' online participation on their relationship to civic identity and engagement. Hypothesis H2 addressed the second research question by testing another set of mediation models for the mediating effects of EM students' civic identity on their relationship between online participation and civic engagement. Briefly, online participation played a positive role and civic identity provided a mediating channel to stimulate EM students' civic participatory behavior. In the cyberspace in which EM students shared civic information and discussed civic affairs, their online participation in this space acted as a stimulator for their engagement in civic activities. Beyond the direct relationships between online participation and civic engagement, the mediation models also explored the mediating role of civic identity in this relationship in order to understand the mediating mechanisms of civic identity by which online participation influenced EM students' levels of civic engagement. The test results of hypothesis H1 and H2 suggested that their perception toward Hong Kong people mediated the effects of online participation on their civic engagement.

IX. Limitation

Despite the contribution this study provides, the study has some limitations. Among the socio-demographic variables, the effect of gender and age are controlled in the study in order to simplify the complexity of the data analysis. Since the study is based on data collected in the cross-sectional survey, it restricts not inference about causality. Thus, the cause-effect relationships between online participation, civic identity and engagement cannot be assumed from the data used in this study. In addition, there is a statistical issue encountered in the structural equation modelling (SEM) of mediation because of too many variables in the models. This issue can be solved by fitting the SEM model with latent variables' estimated values in order to make the SEM more parsimonious. The plausible values are generated using multiple imputations as the measures for the SEM model have been used as the estimated values of latent variables. The plausible values have been imputed using the Bayesian approach that is more reliable than those obtained by the Maximum Likelihood estimator.

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