



MOOC study group: Facilitation strategies, influential factors, and student perceived gains



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ABSTRACT

“Join a Meetup Group” (face-to-face study group) has been propagated by Coursera to build rapport and provide mutual support among MOOC learners; however, studies remain scant regarding its effectiveness and sustainability. This interpretive case study documents our facilitation process, key influential factors, as well as student perceived gains in a six-week MOOC study group. Data sources include discussion recordings, end-of-course interviews, goal setting sheets, weekly reflection journals, and researchers' observation notes. Results showed that, cognitively, participants broadened their perspective of thinking, raised cultural awareness, and shared many learning strategies. Affectively, they established a strong sense of community and gained motivation for learning. Participants also increased action tendencies toward trying out Coursera functions, new courses, and learning strategies, and they became more cognizant of the benefits and procedures of the MOOC study group. Our findings suggest that, with proper design and facilitation, face-to-face study group would be a practicable and effective approach to leverage MOOC students' motivation, engagement, and deeper learning. Implications are discussed in terms of potential gains, challenges, key influential factors, as well as future design and implementation of MOOC study groups.

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1. Introduction

Since 2008, MOOC has evolved from an education buzzword to headlines of mainstream media: The New York Times (Pappano, 2012) announced 2012 as “The Year of the MOOC.” Enrollment has grown exponentially, for example, as of October 2014 Coursera alone has 10 million users in 839 courses from 114 institutions (Wikipedia, 2014). The average enrollment of a MOOC course had reached 20,000, and some courses had exceed 230,000 (Jordan, 2014). Despite its fast growth, issues have arisen regarding the low completion and high dropout rate (Clow, 2013; Johnson, Adams Becker, Estrada, & Freeman, 2014; Yuan & Powell, 2013). Some reported that the completion rate could easily fall below 10% (Guzdial & Adams, 2014; Stein, 2013). Such phenomenon had made Sebastian Thrun, the founder of Udacity admit that “We don't educate people as others wished or as I wished” (cited by Chafkin, 2013). The 2014 Horizon Report (Johnson et al., 2014) pointed out that, “there is a growing need to frankly evaluate the models and determine how to best support collaboration, interaction, and assessment at scale” (p.26).

Among the suggested pedagogical approaches, “Join a Meetup Group” (face-to-face study group) has been recommended to build rapport and provide mutual support for MOOC learners (Koller, 2012; Li et al., 2014). Research has shown that face-to-face study groups, with proper facilitation, can help learners harness their knowledge and skills, formulate senses of community, leverage motivation and learning outcomes, and decrease drop-out rates (Arendale & Hane, 2014; Holiday & Said, 2008; Van Der Karr, 1994; Zevenbergen, 2004). Yet, in spite of the great potential of the MOOC Meetup, and despite that research has burgeoned along with the MOOC phenomenon, studies remain limited regarding the effectiveness, key influential factors, as well as facilitation strategies of face-to-face study groups for MOOC learners. More studies, therefore, are warranted to verify the sustainability of study groups in the context of MOOCs.

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1.1. Study group: benefits, challenges, and facilitation strategies

Study group, defined as “a small group of learners (3–6) who formed informal groups that would meet to work on set problems related to course material” (Zevenbergen, 2004, p.6), has long been recognized as an effective tool for students' learning as well as teachers' professional development (e.g., Barnette, Smith, & Burch, 1987; Clair, 1998; Price, 1992; Van Der Karr, 1994). Under the umbrella of collaborative learning, study groups allowed like-minded individuals to share knowledge and ideas, and to provide informative feedback with each other (Jones, 1997). Over decades, study group has been applied to various educational settings such as k-12 classrooms (Box & Little, 2003; Education Commission of the States, 2000; Good, Grouws, Mason, Slavings, & Cramer, 1990), higher education (Arendale & Hane, 2014; Price, 1992; Yeh, Hung, & Chen, 2012), professional training institutions (Commission of the European Communities, 1997; Hange, Barnett, & Rolfe, 1991), and online learning environments (Groth, 2007; Johnson, 2006; Li et al., 2014).

In the literature, many studies have documented the benefits of study group especially in terms of motivation, engagement, and achievement. Arendale and Hane (2014) reported his observation/reflection of six years teaching history courses. Study group discussions were valuable for students' authentic learning and better retention. Holliday and Said (2008) studied the effects of study group in the context of Physics and Chemistry courses. Students reported better retention and comfort in learning, with the latter measured by participants' lower pulse rates. Notably, the effectiveness of study groups was much more evident when information delivery matched students' learning styles.

Van Der Karr (1994) examined the interactions and group dynamics of student-lead study groups in the context of a community college Biology course. Through observations, interviews, and document analyses, the author found multifaceted gains from the study group, including participants' enhanced study skills, higher comfort level with course contents, greater confidence in class assessments, more out-of-class involvement, and ongoing interest in study groups. The author further identified four types of collaboration within study group: group management, material sharing, knowledge building, and interpersonal interactions. Informal chat was found to be very important to help group members to build rapport and became more involved in the study group.

Zevenbergen (2004) applied study groups in Mathematics education in order to address pre-service teachers' low competency levels and fear of mathematics. Students perceived study groups to be very effective forums for cognitive and affective learning. *Cognitively*, the diversity of teaching approaches among peers had broadened participants' perspectives and changed their views of teaching and learning. The mutual help within study groups not only enhanced participants' overall confidence of mathematics, but it also brought senses of fulfillment when one gave help to others. *Affectively*, students appreciated the less formal and relaxed atmosphere, under which they were free from fear of being thought of as incompetent. The encouragement from peers also helped some students continue study without giving up. The positive experience of the study group had brought enduring effects: some participants kept working with their peers after the end of the course; others transferred what they learned from the study groups and modeled to their students in the subsequent practicum course.

Study groups do not go without challenges despite the aforementioned benefits. Rybczynski and Schussler (2011) studied college students' perceptions of self-initiated out-of-class study groups. While students generally acknowledged the benefits of study groups for social learning and mutual help with unclear ideas, they also identified several challenges including lack of focus, lack of productivity, and logistical problems such as lack of time and an inability to find a group or places to meet. Group composition was highlighted as a key factor of students' preference for study groups, particularly students liked to study with members with a certain “level” of knowledge and commitment to the group.

In the aforementioned Zevenbergen (2004) study, knowledge gaps between younger and mature-aged participants, as well as younger participants' strong senses of ego and competitive ethos had posed threat to group dynamics and collaboration. Some participants' ability and confidence were too low to even try out the study group approach. The author suggested more support from teachers to facilitate study groups, including clear reasons to meet, providing extra support when group members need help, and model effective way(s) of group interactions.

Many strategies have been proposed to facilitate study groups. Rybczynski and Schussler (2011) recommended facilitators to provide a list of good study activities, devise content materials to work together, or design assignments that require students to work together and then distribute to the whole class. Walpole and Beauchat (2008) provided several guidelines of study group support, including 1) *Showing respect* (e.g., using the first study group session to set goals, create a timeline, and set at least one individual responsibility for each participant), 2) *Providing choice* (e.g., providing choice in the curriculum, assessment, or research-based professional books); 3) *Allowing participant voices* (e.g., summarizing a chapter, answering a question, or writing a unit overview); 4) *Building personal connections*, and 5) *Accepting reluctance* (accepting that teachers come to study groups with personal sets of strengths and weaknesses).

In the Hange et al. (1991) study, the authors identified key success factors of study groups, such as group members willing to work, worthwhile discussion topics, and good communication among study group members. Based on these results, the authors provided several guidelines for study group facilitation, including: 1) Arranging small study groups (10 or fewer members) to maintain communications and divided tasks; 2) Helping group members identify important issues or problems; 3) Assisting the production and dissemination of study group products, and 4) Helping group members determine their own processes and products in order to develop commitment and ownership. Together, the guidelines offered by varied studies point to the critical role of facilitation and support. The guidelines also remind us to carefully plan the logistics of study groups so that vibrant and meaningful group dynamics can be achieved, and potential barriers of study groups can be avoided or mitigated.

1.2. Gaps, purposes, and research questions

Liyanagunawardena, Adams, and Williams (2013) systematically reviewed 45 peer-reviewed MOOC publications from 2008 to 2012. Using open coded content analysis, the authors categorized the MOOC literature into eight different areas of interest, including introductory, concept, case studies, educational theory, technology, participant focused, provider focused, and other. *Case studies* stood out as the biggest category (including 21 articles) wherein most studies were conducted within a single course and adopted multiple methods for data collection (Yin, 2014). While the reviewed articles covered a wide range of topics and research settings, Liyanagunawardena et al. have identified several research gaps such as lack of voices from MOOC facilitators, lack of potentially useful data from social media like Twitter

and Facebook, and a paucity of research that investigates experiences of African and Asian participants. The authors recommended further research on factors of student motivation, strategies used by students, possible cultural differences of learners, as well as the experience and practices of MOOC facilitators.

On the other hand, our focused review of study group literature (section 1.1) showed that, although study groups have been successfully applied to various contexts and subject areas, still it is relatively under-researched in online and distance learning environments. What is more, while “*Join a Meetup Group*” has been propagated by Coursera as its fundamental course design element (Koller, 2012), studies on the effectiveness of MOOC study groups remain scant. Among the very few retrievable studies, Li et al. (2014) formed spontaneous study groups wherein Engineering students watched and studied MOOC videos together. Similar to general findings in traditional learning contexts, students reported high levels of satisfaction with the “study group way of learning with MOOCs.” Learning with group members was also perceived as more effective and motivating than individual learning. The Li et al. study provides exciting results of the benefits of the study group for MOOC; however, its primary focus was on interaction patterns when students watched videos together. More studies are still warranted to thoroughly investigate how different forms of study groups can be designed, facilitated, and elaborated to support MOOC learners.

The purpose of this study was to investigate the effectiveness and sustainability of face-to-face study groups for MOOCs. More specifically, this study aimed to examine MOOC students' perceived gains, key factors of the study group, as well as ways for future improvement. This study would not only extend the knowledge base of study group and MOOC learning, but our sharing of experience and practices from the facilitator's perspectives (see Sections 2.3 And 4.2 below) would also help reduce the aforementioned gaps identified by Liyanagunawardena et al. (2013). Three main research questions guide this study:

RQ1: What are MOOC students' perceived gains from the face-to-face study group?

RQ2: What are the key factors that influence the dynamic/effectiveness of the MOOC study group?

RQ3: What are MOOC students' suggestions to improve the face-to-face study group?

In the following sections we will firstly present our research design with an emphasis on the configuration of the face-to-face study group such as its design rationales, meeting agenda, and facilitation strategies. The research context and study group interactions will also be described in detail. Next, the results section will be organized around the three main research questions, based on which we will discuss how the participants' gains and the challenges we faced may inform future design, facilitation, and research on MOOC. In particular, we will discuss how *sense of community* and *social comparison* may synergistically influence the success of a MOOC study group. Several facilitation guidelines will be proposed accordingly to ensure healthy and constructive group interactions.

2. Research design and methodology

This study employed an interpretive case study approach (Merriam, 1988; Stake, 1995; Yin, 2014), which “facilitates exploration of a phenomenon within its context using a variety of data sources” (Baxter and Jack, 2008, p.544). According to Yin, a case study design is suitable when the focus of a study is to answer “how” and “why” questions, and/or when contextual conditions are very important to the phenomenon under study. Merriam further stated that,

... investigators use a case study design in order to gain an in-depth understanding of the situation and the meaning for those involved. The interest is in process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation. (p.xii)

We contend that, compared to quantitative methods like structural equation modeling (e.g., Chen & Jang, 2010) and canonical correlational analysis (e.g., Chen & Jang, 2014), the case study approach is more suitable for us to closely examine student perceptions, peer interactions, as well as key influential factors behind the scene. In Liyanagunawardena et al.'s (2013) analysis of the MOOC literature, 46% (21/45) of the reviewed studies were case studies. The statistics signifies that, case study is not only a legitimate but also an important and most commonly used research method in the strand of MOOC research. This study, to our knowledge, would be one of the earliest studies that report a completely volunteer MOOC study group from Asian (Taiwan) students' perspective. Therefore, our study group could be regarded as a “special and significant case” ideal for case selection (Yin, 2004).

2.1. Participants and study group formation

The target population of this study was the audience who attended a 2-h guest speech entitled “*From OCW to MOOCs: Implication for college students.*” After the speech, the researchers invited the audiences to sign up for our MOOC study group to gain more hands-on experiences on Coursera. In the end, a group of four (all female) was formulated. The four participants were assigned Lisa, Helen, Sue, and Mary as pseudo names. Except for Mary who had taken one online course in the past, none of them had prior online learning experiences. Participants' intensity of Internet use varied significantly at the beginning of the study group. Helen and Mary spent less than 5 h per week. Lisa reported an interval between 5 and 10 h, while Sue spent 10–20 h per week on the web. Below are short profiles of the participants:

Lisa was a junior majored in Chinese Literature. According to the goal setting sheets and the reflective journals, time management had been her main concern. She had set rather modest but reasonable goals, such as “do my best to complete the course, because I am too busy” and “I have not given up yet. Maybe I will complete it somehow.” In a weekly meeting she admitted that she had once regretted to join the study group due to her tight schedule, but then she decided to stay because she wanted to keep the promise to herself and other members since she had already joined the group. Lisa expected to discuss with the group members about the scientific reasoning of the MOOC instructor, and she wanted to learn more about time management from peers.

Helen was a freshman who also majored in Chinese Literature. Perhaps due to a different grade level, she did not seem to be acquainted with Lisa. Helen cared more about how to think and reason effectively, and she expected to discuss and learn from study group members

regarding course materials and ways to complete the course assignments. Over the weeks she had revised her learning goals from “finding extra time for thinking” to “think in a limited amount of time.” It appears that she was also constrained by the limited time for study and felt the pressure to think fast. Notably, in the last goal setting sheet she expressed that, “I will arrange additional MOOC learning in the upcoming winter break” (week 6 reflection journal).

Sue was a junior studying Green Energy Technology. She had set rather elaborated goals including daily plans (e.g., “Read four chapters of the original *Red Chamber Dream* novel [the common course selected by the study group]”), weekly plans (e.g., “Watch videos and do assignment in a fixed period of time”), and the ultimate goal (e.g., “Think about the true meaning of the online courses to me”). Besides joining our study group, she was also self-studying the Engineering Graphics course on Coursera. Similar to Lisa, Sue expressed more concern over time management in her reflection journals, particularly she wanted to discuss with team members about how they scheduled their time, how they urged themselves to study MOOCs, as well as how to find the impetus for learning.

Mary was the second year graduate student studying Ecotourism, and she was the only graduate student among the study group members. Interestingly, part of her original intention to come was to find inspirations for her master's thesis proposal. She would like to observe how the MOOC instructor structured content and presented ideas, and she wanted to take the chance of the study group meetings to remind herself to keep going on her thesis proposal. While in the end Mary finished her proposal and stopped taking the course on Coursera, she kept attending the study group until the last meeting. She expressed that, “Although I stopped taking *Red Chamber Dream*, I am still learning from the MOOC study group regarding how to learn, how to reflect, and the appropriate attitudes for learning” (week 6 reflection journal).

In the first group meeting we gathered in the computer lab. The main agenda included *ice breaking*, *technical orientation*, *course selection*, *rule setting*, and *communication building*. Participants took turn introducing themselves, and then the researchers debriefed the research purpose and scope and let participants sign the informed consent form. A step-by-step technical orientation, which lasted for approximately 45 min, was led by one researcher to help the participants familiarize themselves with the Coursera platform (e.g., register accounts, browse course categories, and try out different course elements such as the syllabus, videos, assignments, and the discussion forum). Other than technical orientation, issues of online learning, such as time needed for study, teacher and student roles, and the online learner dropout rate were raised by another researcher to help the participants formulate reasonable expectations of online and MOOCs learning. For communication, one participant volunteered to collect phone numbers and emails for the study group. Another participant helped setting up a Facebook group as a communication tool to exchange feelings and thoughts of their study, as well as posting group announcements. Finally, participants discussed and agreed to meet weekly for the following sessions.

2.2. The research context

During group discussion time of the first meeting, participants were encouraged to pick one course on their own to study together. They were also encouraged to set up the logistics, division of labor, and ways of communication for their study group. During that phase, the researchers kept away from their discussion to maintain participants' senses of autonomy. In the end, the participants reached an agreement to take *Red Chamber Dream*, a six-week course on Coursera (see Fig. 1 for a snapshot). The course, which was about a classic Chinese novel, was taught in Chinese and just started two weeks before our first group meeting. According to National Taiwan University that offered the course, *Red Chamber Dream* ranked third among the most popular Chinese courses on Coursera. Approximately 19,000 students were enrolled in the course, among them 14,800 were from China. As described in the course syllabus, students were expected to spend 3–6 h per week studying. This is consistent with the empirical data reported by our study group participants.

In terms of course design, *Red Chamber Dream* contained six lessons each took one week to accomplish. Students had to watch lecture videos each spanned 10–15 min long. One to two short quizzes were embedded in every lecture video to assess student comprehension and to maintain learner concentration, which is a common design feature among Coursera courses. Each week students completed an assignment that contained open ended questions, and then these completed assignments were disseminated by the system for peer grading. At the end of the course students took the final exam that contained multiple choice questions. Students were qualified for a certificate when they completed all of the assignments and passed the final exam.

It is worth mentioning that the assignments were due on Tuesdays rather than weekends. They did not allow for late submissions, and some even required minimum word count (e.g., 350 words) or at least one third of the answers should be citations from the original novel. These requirements and course settings had been reported by our participants as big challenges, which in turn negatively affected their motivation to study.

As with interactions and learner support, course announcements were posted by a teaching assistant. To our memory, the instructor also posted announcements at the beginning and the end of the course. The discussion forum was carefully crafted, which contained four main areas: 1) the *Course Function Area* to ask for technical support; 2) the *Assignment Area* to ask questions related to assignments and peer grading; 3) the *“Lobby” Area* to make friends and discuss course related issues, and, 4) the *General Discussion Area* to post miscellaneous questions. Students were free to post messages to the discussion forum, but the course did not require them to take part in such online discussions and interactions.

2.3. Study group agenda and facilitation strategies

The subsequent face-to-face meetings normally took 2 h. Each week we chose a different restaurant or cafeteria to enjoy the casual atmosphere for talking. At the beginning of the gathering, the researcher asked the participants to review their individual goals set in the last meeting, and then wrote down new goals for the week to come. After that, group members took turn sharing learning experiences (based on the reflection sheet) such as difficulties encountered, strategies developed, and knowledge gained in the past week.

A more structured focus group discussion followed to probe participants' perceptions and actions toward their MOOC learning. When devising focus group topics (see Table 1) we referred to the six dimensions of the *Online Self-regulated Learning Questionnaire* (OSLQ, Barnard, Lan, To, Paton, & Lai, 2009), including 1) *Goal setting*, 2) *Environment structuring*, 3) *Task strategies*, 4) *Time management*, 5) *Help seeking*, and 6) *Self-evaluation*. The rationale was that, since online and MOOC learning environments are characterized with anytime,

人物行為的理解有所失準。誠然，若是只將《紅樓夢》作為一部消遣作品，讀者自然可以隨意揮灑自身的感性。但是，《紅樓夢》不只是一部小說，它同時也不折不扣是一部在文學史上佔有一席之地之偉大經典。一部偉大的經典，要由偉大的讀者成全，而偉大的讀者，只有在閱讀者讓理性超越於感性之上，精準而公正地面對文本時才會誕生。

賈府的世界奠基於曹雪芹的家世背景之上，一個現代人未加研究便無法理解的貴族階層，其中交錯的人際網路，牽一髮而動全身，一舉一動，俱有規範。未曾置身其中的人，往往容易錯過其中微小的細節，而誤解了人物行為為所為的真正目的。

這門課的目標，將會嘗試解析經典與讀者之間的關係，並由此進入曹雪芹與紅樓夢賈府的世界，一步步剖析往昔時常為人所誤解的種種行為與情思，重新認識這個人所共愛的小說經典。

《紅樓夢》的世界是如此複雜乖隔，賈寶玉、林黛玉、薛寶釵等人面對的人性是如此深遂多變，這一次細細重讀，或許能讓我們與書中人、與作者曹雪芹的心意更加貼近，從而發現一個全新的紅樓夢景。

Course Syllabus

第一單元：「面對經典的讀者要求」
 第二單元：「認識曹雪芹」——沒落貴族的落魄王孫
 第三單元：「《紅樓夢》的世界」——貴族世家的獨特探照
 第四單元：「世族家庭的人際網絡 I：嫁禍說」
 第五單元：「世族家庭的人際網絡 II：告密說」
 第六單元：「《紅樓夢》的愛情觀」——超越才子佳人

Unit One: ...
 Unit Two: ...
 Unit Three: ...
 Unit Four: ...
 Unit Five: ...
 Unit Six: ...

Recommended Background

·因上課閱讀文本與作業需要，修習本課程具備基本中文閱讀與寫作能力

Basic Chinese reading and writing skills are required for completing course readings and assignments.

Suggested Readings

·庚辰本紅樓夢

The Red Chamber Dream (The Geng-Chen Version)

Course Format

這個課程將會由講演的影片所組成，每小段長度在十到十五分鐘之間。每小段影片備有一到二題的影片內小測驗。另外在影片之外，還會有獨立的作業與期末考試，作業形式分為申論題與選擇題，期末考形式為選擇題。

Course at a Glance

📅 7 weeks of study
 ⌚ 3-6 hours/week
 🇨🇳 繁體中文

Instructors



歐麗娟 Li-chuan Ou
 National Taiwan University

Categories

Humanities

Share

Tweet

The present course aims at exploring the world of Cao Xuequin (the author) and the family of Jia, by analysing the relationship between classics and readers. Step by step, we will re-interpret those easily-mistaken actions and emotions in the novel and re-learn this much-loved classic novel.

The class will include video lectures, between 10 and 15 minutes in length, containing one or two quizzes per video. In addition to lecture videos, there will be homework assignments consisting of graded multiple choice and questions and a final exam consisting of graded multiple choice.

Fig. 1. Snapshot of the MOOC course.

anywhere, and self-paced learning, self-regulation becomes an even more critical factor for success (Barnard et al., 2009). Inclusion of these topics is likely to help our participants reflect upon and share/learn self-regulation strategies with each other. Table 2 presents samples of group discussion under the six OSLQ dimensions, which authentically portray the flow of discussion, peer interactions, and the researchers' facilitation *in situ*. The numbers of coded references were also presented in the table to illuminate the intensity of discussion across the six dimensions.

After focus group discussion, free discussion time (approximately 30 min) was reserved for the group members to build rapport and exchange ideas about course materials and learning strategies. At the end of each meeting, we thanked group members' participation and dispersed the reflection sheet for them to take home and bring it back in the next meeting. The guiding questions in the reflection sheet include:

1. In this week, what did I do for MOOC learning? What are the difficulties that I encountered? What have I learned?
2. The topics that I want to discuss/share with group members this week are ...
3. What I learned from this week's study group are ...

The researchers also served as facilitators. Influenced by the study group guidelines offered by previous studies (e.g., Hange et al., 1991; Walpole & Beauchamp, 2008), we intended to leverage learner autonomy and participant voices rather than exerting control. Therefore, during the weekly meetings we stimulated group discussions and encouraged experience sharing but avoided top-down manipulations and direct instructions. In fact, Deci and Ryan (1985, 2002) self-determination theory (SDT), which emphasizes individuals' basic needs of autonomy, competency and relatedness, had substantially informed our study group design and facilitation. Self-determination theory has been substantiated in online learning (Chen & Jang, 2010), and recently it has been adopted by Hew (2015) to explore factors of student engagement in three top-rated MOOCs. Past SDT-based research has identified effective strategies of educators; for example, Reeve and Jang (2006) validated eight types of teacher's autonomy-supportive behaviors, such as *allowing choice*, *providing rationale*, and *offering informational feedback* that enhanced students' perceived autonomy, engagement, and performance. Table 3 presents the SDT-based facilitation strategies that we utilized in this study.

It is worth noting that upon finishing the coding of the study group verbatim, the researchers' facilitation-related narratives had been sorted into seven categories: 1) Encouraging experience sharing; 2) Creating opportunities for extended learning; 3) Offering technical support or extra resources; 4) Resolving language problems; 5) Providing informative feedback and encouragement; 6) Suggesting learning strategies; and, 7) Clarifying ideas or raising questions. Details are portrayed in Table 4.

Table 1
Arrangement of the weekly study group.

Week	Discussion topics
Week 1: Orientation	Course selection rationale
Week 2: Regular meeting	Goal setting
Week 3: Regular meeting	Time management
	Help seeking
Week 4: Regular meeting	Environment structuring
	Task strategies
Week 5: Regular meeting	Self-evaluation
Week 6: Wrap-up	Recap on the six OSLO dimensions
	Motivational factors of online learning (autonomy, competency, relatedness)

2.4. Data sources and analysis procedures

Multiple data were gathered in this study, including study group discussions, end of course interviews, goal setting sheets, weekly reflection journals, and researchers' observation notes. Among them, study group discussions and interviews served as main data sources; the other types of data were used to support or triangulate findings. Similarly, data were processed through multiple coding methods, of which the main approach was *structural coding* (MacQueen, McLellan-Lemal, Bartholow, & Milstein, 2008; Namey, Guest, Thairu, & Johnson, 2008). At the outset, the researchers considered the overall research scope, main research questions, and dimensions of concern, and then constructed them into an initial coding tree in the NVivo software (see Fig. 2 for a snapshot). The question/topic-based structural codes served as an indexing device that helped us both coding and initially categorizing data into manageable formats (Saldaña, 2012).

Subsequently, *open coding* (Glaser & Strauss, 1967; Strauss & Corbin, 1998) and *focused coding* (Charmaz, 2006) methods were applied to each structurally coded segment to explore the most salient codes or categories that “make the most analytic sense” (Charmaz, 2006, p.57). It is worth noting that after several rounds of coding, *simultaneous coding* (Miles & Huberman, 1994) naturally happened because one chunk of data often suggests meanings in multiple dimensions. It is especially true in this study because it contains eight main structure codes such as self-regulation, researcher facilitation, perception of the Coursera platform, and things gained from the weekly study group – which is reported in this paper.

The two researchers took the whole duty of the first round coding (the structural coding). Using the NVivo software, we independently organized data into the pre-determined structural nodes, and then we merged the coded files to detect similarities and differences of coding. An analysis of NVivo coding comparison showed that, agreement ratios of most nodes lay between 70% and 99%. Inconsistencies of coding were further discussed and consolidated.

Two meticulously trained research assistants joined the subsequent rounds of data analysis (i.e., free coding, focused coding, and initial interpretation). Previously, they helped transcribe group discussion and interview recordings and gained some sense of the data. Now they helped identify key terms and concepts within each structural node, and they organized key codes into initial categories using the Microsoft Word program. They also helped elaborate on the two researchers' (and also generated their own) analytic memos using the “annotation” function of NVivo and Word. To ensure intercoder reliability, the two research assistants regularly double-checked each other's nodes or categories. The assistants' initial work had been reviewed and modified by the two researchers to attain more consolidated results that align with the research questions. The research team met weekly to discuss findings and to resolve any problems pertaining to data analysis.

3. Results

3.1. RQ1: What are MOOC students' perceived gains from the face-to-face study group?

The MOOC students' perceived gains from the study groups were thematically organized into: 1) Cognitive gains, 2) Affective gains, 3) Enhanced action tendencies, and 4) Other gains. Details are presented in the following subsections.

3.1.1. Cognitive gains

3.1.1.1. Broadening perspectives. A major gain from the study group was that it broadened students' perspectives. Study group discussions allowed the participants to exchange ideas such as interpretation of course contents and associated learning strategies. Furthermore, participants appreciated the diversity that the group members were of different age and study major. This helped them go beyond their ordinary social circle (and perhaps, comfort zone) and exposed themselves to different experiences and perspectives:

What I think the main point [of gains] is the exchange of ideas. Every time I felt that everyone has different learning approaches and strategies. (Lisa, week 6 study group)

My deeper impression is on Mary. Actually every time I found my opinion quite different from hers. For example, she thought the course instructor quite objective, but I felt the instructor very subjective in explaining ideas. By participating in this MOOC study group you would have a chance to meet people with different majors and levels ... For those graduate students, their perspectives are more mature, and they should see more than I do. Many times they reminded me many things. (Lisa, interview)

In the group meeting Mary mentioned something that made me think. On my side, from the guest speech I found that MOOC was a good stuff and I simply wanted to try. But I found Mary had a different motivation in it: she wanted to write her thesis. I thought that, oh, we can do things that way. I mean, when you have a task to finish, you can take initiatives to seek various opportunities. (Sue, interview)

Table 2
Samples of group discussions on OSLQ dimensions.

Category	Group discussion sample
Goal setting (36 instances)	<p>(Changes of goal setting) (Week 3 study group discussion) Researcher A: Would everybody share your goals and see if you have modified them since last week? Helen, would you like to start first? Helen: Sure. My first-week goals were to finish the assignment, read more books about Red Chamber Dream, and then spend more time on independent thinking. I mean, don't just keep listening to the instructor. Get rid of the passive/transmission model of learning. In Taiwan, it seems that students accept and learn whatever taught by the instructor. For this week, [goals are] pretty much the same, <u>but what is different is that, last week I wanted to spend extra time for thinking, but this week I want to stimulate my thinking within a limited amount of time.</u> Researcher A: Hmm, sounds different. Helen: <u>This way I will think faster, because I really have time constraint.</u> Sue: Where there is pressure, there is impetus to move on. Helen: <u>Yes, because of time constraint, some ideas will suddenly pop up.</u> I also expect to learn more deeply on Red Chamber Dream; also I want to make good use of time – the shared goal among us. Researcher A: Okay, thank you. How about Sue? Sue: <u>Last week I was kind of ... set short-, mid-, and long-term goals.</u> The short-term goal is to read four chapters of the Red Chamber Dream novel daily. Then the weekly goal ... I hope to find a fixed day in the week, either in the morning or in the afternoon to work on the assignments. Helen: Sorry I have to leave early. Lisa: Cheers, Helen.</p>
Environment structuring (8 instances)	<p>(Studying at home vs. with classmates) (Week 5 study group discussion) Researcher B: So how do you normally prepare for your final exam? Will you set up time frame or something? Sue: <u>I will study with classmates.</u> Researcher B: Oh, study together. Go to the library or..? Lisa: Will you discuss together? Sue: Yes. Mary: Is that efficient? Sue: <u>Go to my classmates' house.</u> Helen: What's the matter with studying at home? Sue: <u>Too many temptations at home.</u> Lisa: Oh, I understand what you mean. Helen: Unless you are very determined to study, ha–ha.</p>
Task Strategies (54 instances)	<p>(Using smartphones to watch MOOC videos) (Week 3 study group discussion) Researcher B: Sue just mentioned that we can watch lecture videos on the smartphone. Is anyone learning this way? What do you think about the learning effects? Helen: Oh I didn't do that. Sue: You can watch videos when/wherever you are online, and I think that the learning effect is the same [as computers]. <u>In fact, I was very concentrated. I have already downloaded and read the video captions in advance, so I just focused on watching the video. Moreover, I didn't take notes. Because of it, I can be even focused. Therefore, I think it is okay to use mobile devices.</u> Researcher B: "Mobile devices." Sounds pretty professional. Sue: Because it includes not only smartphones but also tablets and laptops. Researcher B: It occurred to me that the videos can be downloaded and watched offline. Sue: Yes, it is very convenient for reviewing the lessons. Mary: <u>But don't you think the screen is too small?</u> Sue: No, there is no text on the video. You can focus on listening anyhow. Mary: Just listening is okay ... Sue: Yes, yes. Just listing to the instructor. But you have to be concentrated and follow the instructor. Researcher A: Hmm, the smartphone was used to listen as opposed to read. Sue: It is easier to concentrate when I used the smartphone; especially I became more immersed in learning when I wear the headset. Mary: <u>But listening with headsets may cause hearing loss.</u> Lisa: The videos are not very long so you can take a break after watching them. Sue: You can rest after the short videos, and you can watch videos in the 10 min break between classes. Helen: Won't that be too much pressure for you? Sue: I did that when I was running out of time (laughing)</p>
Time Management (33 instances)	<p>(Time spent on MOOC study) (Week 2 study group discussion) Mary: For the second assignment we need to pay attention to the due date. Lisa: Really? I haven't done the assignment and peer grading yet. Helen: Yes, grading and do the assignment. <u>The difficult part is to find time. We have to reserve time [for the assignment].</u> Sue: Time management is the issue. Researcher A: How much time do you think you need for the assignment? Do you have any expectations? Mary: I just think it will take more and more time. Lisa: <u>In fact the time I spent was much more than expected. Originally I thought I could finish it in 2 h.</u> Researcher A: Sounds like just browse the videos and type the answers out. Lisa: <u>Although the videos are short they include lots of key points. You have to watch them very carefully and memorize the key points. Moreover, you have to ruminate over the assignment questions. You cannot directly copy/paste what the instructor said to the assignment.</u></p>

(continued on next page)

Table 2 (continued)

Category	Group discussion sample
Help Seeking (24 instances)	<p>(Reasons to use/non-use of the course discussion forum for help) (Week 3 study group discussion)</p> <p>Researcher B: Have you ever used the course discussion forum during study? (group members said yes) But why didn't you ...</p> <p>Mary: You mean not responding to the postings?</p> <p>Researcher B: Yes. At least, did you hit the Up or Down buttons?</p> <p>Lisa: The Up or Down buttons?</p> <p>Sue: That is similar to the "Like" function on Facebook, and hitting "Up" means you agree. If more people are agreeing with the posting it will jump to the top of the page.</p> <p>Mary: And hitting the Down button means you disagree.</p> <p>Researcher B: Would everyone share more thoughts?</p> <p>Mary: I react to the postings only when they are related to my study. If I don't have questions I won't touch it.</p> <p>Lisa: Same here. If I don't have questions I won't respond to postings.</p> <p>Researcher B: Did anyone see the topics you are interested in?</p> <p>Helen: Topics you are interested in ...</p> <p>Lisa: It's a little weird to talk about it as the assignment is past due. (Everyone laughing)</p> <p>Researcher B: Just curious about everybody's opinions on the discussion forum.</p> <p>Helen: Lacking interest in it ... Because if people are discussing some topics lively, reading them will interfere with my thinking. I want to answer the assignment questions using my own way.</p> <p>Researcher A: Sound like you are mentioning assignment-related discussions. You think reading them will affect your reasoning, is that true?</p> <p>Helen: Yes, I want to think outside the box. Maybe my thoughts are newer.</p> <p>Researcher A: Will you check and compare your opinions with those on the discussion forum after the course is over?</p> <p>Helen: Hmm ... we'll see, but not now.</p>
Self-evaluation (13 instances)	<p>(Self-efficacy for the assignments) (Week 2 study group discussion)</p> <p>Helen: Oh I just encountered a problem. There is a "minimum 350 words" requirement [of the assignment questions]. To me that is a kind of pressure, something that I have to get through. I couldn't be like her (Mary) who has very fluent thoughts when doing the assignments.</p> <p>Mary: Well, just for the first week. I couldn't do that well in the second week.</p> <p>Helen: Right, because it has minimum word requirement. Were it not for the requirement, maybe I will ...</p> <p>Researcher B: Will you do that better?</p> <p>Helen: I'll just do it simple and strait.</p> <p>Mary: But I just scraped through the minimum word requirement.</p> <p>Helen: Seems like people just wrote some ... [unrelated things] just in order to meet the 350 word requirement. (Group members sharing some examples of verbose essays by elementary students ...)</p> <p>Researcher A: Were there be no such word requirement will you do it better? What do you think?</p> <p>Helen: My feeling was that "These are all about what I want to answer. That is as far as I can go." I don't have time.</p>

Because everyone has a different study major, there are more chances for me to view things from different angles. Owing to this MOOC learning, I have a feeling of broadened perspectives. My ordinary life [social circle] encompasses classmates, peers, or teachers. Now with the team members, my eyes opens, and the way I think of things becomes different. (Sue, week 4 study group)

3.1.1.2. Raising cultural awareness. In addition to broadening perspectives from group members, participants were aware of the cultural differences between Taiwanese and Chinese students. One was that students from China posted many threads to the Coursera discussion forum. Compared to Chinese students, Taiwanese students were much more reticent. Another instance regards the course assignment. One participant shared her observation that some Chinese students wrote answers emotionally. However, that participant was more rational in expressing ideas. Whether or not the participant subjective feeling was true, the comparative observations and study group sharing had raised the cultural awareness among the group members – and the researchers as well.

Sue: I observed another phenomenon that, people from China are more accustomed to posting something on the discussion forum, whether asking questions or just chat. They are at ease on the discussion forum and are not afraid to ... to ...

Lisa: Express themselves.

Sue: Yes, to express themselves by posting threads. By contrast, we Taiwanese are more reserved. We see some threads similar to our ideas and give a "like" rather than expressing our opinions explicitly. (Week 3 study group)

Table 3
Self-determination theory-based facilitation strategies.

Basic needs	Facilitation strategies
Autonomy	Proving rationales of online learning and MOOC study Participants' own selection of a course to take together Participants' decisions on the frequency of the face-to-face meeting Participants' decisions to connect to other group members
Competency	Offering an initial technical and academic orientation Introducing self-regulation strategies Sharing learning experiences Sharing related learning materials
Relatedness	Providing informative feedback on participants' performance Study group discussion and sharing in a less formal manner Facebook group Email notifications and reminders of course routines

Table 4
Coded categories of the study group facilitation.

Facilitation category and intensity	Example
Encouraging experience sharing (52 instances)	Researcher A: I am curious about how much time is needed to think, plan, and read the course materials ... If you want to attain higher levels of achievement, how much time do you think it normally takes? Please share your experience with us.
Creating opportunities for extended learning (2 instances)	Researcher B: If all of us are interested in some English courses, maybe we can write the course names down and share with each other. Then we will know what kinds of courses we are more interested in.
Offering technical support or extra resources (31 instances)	Researcher A: You can try this laptop during group discussion later ... Sometimes it is weird, for example, when I taught a class this morning, somehow the HTML editor disappeared under the Chrome browser. However, another student used the IE browser and it was quite normal. So different web browser may have different technical properties and settings.
Resolving language problems (4 instances)	Researcher B: Let me say more about English. The Grokr website, as I showed you earlier, has Chinese captions for many courses.
Providing informative feedback and encouragement (23 instances)	Researcher A: Glad to hear that you didn't burn the candle at both ends and strived to finish it. You did not give up. Researcher A: I feel that you are doing great expressing yourself. I remember last week you said you wanted to improve your oral expressions to be more logical and fluent ...
Suggesting learning strategies (15 instances)	Researcher A: There is an online TA. Maybe you can ask her questions or provide feedback on the course. Researcher B: This gives me some inspiration. For me, I will find the "kids version" of Red Chamber Dream, jot down the outlines of the stories, and make a map to portray the relationships between the characters in the novel.
Clarifying ideas/raising questions (104 instances)	Researcher A: Well, for peer grading, do you think it possible for peer students to grade such a difficult assignment that requires high order thinking? Researcher B: Sorry for interruption. This week we are talking about "Goal setting." Seems that both of you have not mentioned it yet.

Researcher B: During weekly meetings we have discussed that Chinese people answered short questions differently than we do.

Helen: Oh I recall it. I forgot the original question, but a Chinese student just deviated from the questions and expressed the answers very emotionally I felt that we just need to answer the question rationally ... I feel that they tend to deviate from the topic. (Interview)

3.1.1.3. *Sharing learning strategies.* Furthermore, participants shared many learning strategies during study group discussions. For example, one participant downloaded and read all the captions before watching course videos. This gave her a deeper grasp of the course content in the text format. Another participant used her smartphone and the headset to watch course videos so that she could use trivial time to study. She also recommended switching between course assignments and class videos to quickly find answers to the course assignment. Still the other participant mentioned citing multiple resources to strengthen her arguments in the course assignments. These shared strategies were valued by our participants as the benefit of study group interactions.

Name	Sources	References
A_Weekly goals and reflections	4	10
B_experiences and backgrounds	6	20
C_motivations for choosing and studying the course (SDT)	9	47
D_OSLO_self-regulated and Self-Efficacy	9	179
D1_Goal setting	7	36
D2_Environment Structuring	5	8
D3_Task strategies	8	54
D4_Time management	9	33
D5_Help seeking	9	24
D6_Self evaluation	5	13
D7_Computer and Internet Self-Efficacy	1	2
D8_Online communication self-efficacy	6	9
E_Discussion of online learning of Dream of the Red Chamber_Coursera	9	182
F_learning, reflection, problems and challenges of learning process	9	73
G_facilitation of researchers	10	231
G1_Encouraging experience sharing	7	52
G2_Creating opportunities for extended learning	2	2
G3_Offering technical support or extra resources	6	31
G4_Resolving language problems	2	4
G5_Providing informative feedback and encouragement	7	23
G6_Suggesting learning strategies	6	15
G7_Clarifying ideas_raising questions	7	104
H_study group	9	118
H1_interactions between group members	9	50
H2_initialing topics	7	16
H3_usefulness of study group and suggestions	7	52
I_Clarification	4	7
J_Other_temporarily uncategorized	0	0

Fig. 2. Snapshot of the NVivo coding tree.

During discussions I can hear different opinions and learn from everyone. When I hear about a good method I usually give it a try. (Helen, week 6 study group)

There are many main points in the course materials. I will ruminate over the most important points and then type them out in my own voice ... using Microsoft Word. This is a very good strategy that I learned from Sue. (Helen, week 6 study group)

Noteworthy, to ease the study pressure, a student shared her coping strategy by changing the mindset: “At that time I almost gave up ... but I decided not to care about those [assignment grading] standards. It is my choice to submit the assignment or not, but the resources provided by the instructor are really good to stimulate your thinking” (Lisa, week 6 study group). From the viewpoint of [Deci and Ryan \(1985, 2002\)](#) self-determination theory, the student had successfully transformed her motivation from *introjected regulation* to *identified regulation*. The former means that individuals introject the tasks into internal “ought” or “should” motives and usually feel guilty or anxious; the latter means that individuals recognize the tasks as personally important and become more dedicated/self-determined to complete the tasks.

3.1.2. Affective gains: enhancing momentum for learning

Affectively, participants revealed intensified motivation for learning. In fact, at the beginning the participants did not take their MOOC study seriously; however, after establishing senses of community (a key factor that will be detailed in the next section), participants affected each other on learning attitudes. They inspired and encouraged each other to continue to study when some group members encountered difficulties. The following excerpt reflects the participants' morale and how it affected everybody's motivation:

Researcher: What do you think the study group inspires you?

Helen: Everybody's attitude.

Mary: Insist to the end. Everybody has very high motivation, the motivation to insist.

Helen: Yes, insist, insist, and insist. (Week 6 study group)

Furthermore, “study together” itself had exerted influence on the MOOC students. Compared to solitude learning, participating in the study group made them feel connected with people who had similar goals and learning tasks. Such feeling of connection enhanced participants' learning motivation. One participant stated that, “I know there are open courses or MOOCs but may not ever touch it at all. Now I participate in this study group and I can interact with a group of people. I feel that I have more momentum [to learn]” (Lisa, week 3 study group). Participants also mentioned that the study group provided a mechanism that explicitly or implicitly reminded them to keep on track. One participant stated that, at the very least, the fixed study group meeting time served as a reminder to keep her stick to the original goal:

I feel that it makes a difference to come to the study group; at least it is a fixed activity within the week. I am a forgetful person ... the study group is a kind of force that passively provides continuous control. If I were doing MOOCs all by myself, I may forget about it, even I have the original motivation to learn. (Sue, week 5 study group)

3.1.3. Enhanced action tendencies

The third category of perceived gains pertains to enhanced action tendencies, which means that the study group participants became more active putting their thoughts into real actions. As mentioned earlier, one participant talked about trying out others' learning strategies after group discussions. She further shared with us that she became more active in learning and sharing due to the sense of community, and the MOOC experience made her decide to experience more online courses:

Researcher B: Do you perceive any benefits of the conglomeration power [sense of community] on your MOOC learning?

Helen: Definitely. I become more active, for example, when I thought of something I am eager to share it in the coming week. Moreover, I feel that I am not merely “standing outside of the door.” I would like to go inside.

The researcher: What do you mean by “going inside”?

Helen: I mean, because of this [MOOC study group] experience, I want to experience the next one. (Helen, interview)

Similarly, another participant said, “In the past I have read something about study groups or Meetups, but it was not until joining this study group that I really pressed the “Join a Meetup Group” button on Coursera, or went to the discussion forum and posted something on it.” She also thought about applying the study group model to the Open Courseware (OCW) and finding some courses to study with her classmates. She concluded that, “I found I have changed. That is, in the past, I thought about learning something online but did not really carry them out. But after this MOOC study group I will go find OCW, and will really carry them out” (Sue, week 6 study group).

3.1.4. Other gains: learning about the nature of the study group

Beyond our expectation, one student mentioned that “I have learned the model and the direction of the study group, and I think I can refer to this model in the future.” In the following excerpts, the participant said she realized why we gathered people to study together. She was also cognizant of the logistics of the study group, including our facilitation strategies and guiding questions.

Sue: Moreover, for study groups, I know better about its effects. I do not have prior experience on study groups. Now I understand why we need to get together and discuss ... [for example], I may be doing B instead of doing A as originally planned. If you participate in the study group, others will remind you to get back to your original mindset.

Researcher B: Can you explain what you have learned from the study group experience?

Sue: Just like the interview questions, there are rationales behind the questions. What I see is that, if you are doing a similar study group, there is a flow and logistics behind it.

Researcher B: Do you mean you've learned how to manage or facilitate a study group?

Sue: Yes, the facilitation methods. I seldom see them before. (Interview)

3.2. RQ2: What are the key factors that influence the dynamic/effectiveness of the MOOC study group?

3.2.1. Sense of community

In this study, the group members formulated the *sense of learning community*, or what they called the “*conglomeration power*” that enhanced the dynamic and effectiveness of the MOOC study group. Such a sense of learning community was gained from openly sharing thoughts and helping each other during the study group sessions. One participant described that she originally just came to see what MOOC looked like but weeks later she found herself expecting the weekly meetings to come: “I became expecting the gathering, and when I thought of something I will write it down so that I can share with others next time” (Sue, week 4 study group). She was especially impressed with the depth of sharing and self-exposure by group members. She said,

The first time, the very first time that I came, everyone expressed their inner thoughts without reservation. Instead of merely describing how difficult the course was or something superficial, everyone shared their inner thoughts such as feelings and personal changes, or how to deal with problems. (Sue, week 6 study group)

Another participant explicitly described her feeling of the sense of community and how it functioned in the course of the study group, as detailed in the following excerpts:

Conglomeration power, haha. That is a gradual change of mindset, something from the ground up ... a feeling that I have something to accomplish. (Helen, week 5 study group)

When someone encounter hardships he or she should speak out, and so we can find answers and resolve the problems together. This will increase the conglomeration power among people To enhance the conglomeration power, we should take more initiatives to contact/interact with others. (Helen, interview)

Researcher B: Do you think this conglomeration power helpful for your MOOC learning?

Helen: Of course ... I became more active, for example, when I thought of something I was eager to share with others in the next meeting. (Helen, interview)

3.2.2. Social comparison

In addition to sense of community, *social comparison* was identified as another salient factor that influenced the dynamic/effectiveness of the MOOC study group. More specifically, we found that social comparisons had brought about three kinds of effects: 1) provoking individuals' reflection on self-goals, 2) releasing uncertainty and pressure, and 3) stimulating positive competition among peers. First of all, through interactions and observations of others, individuals generated more reflections on their goals. For example, one participant observed that another group member was as busy as she; in turn it prompted her to reflect on her self-motivation when the learning task was not compulsory:

Sue: I found that Lisa was actually very busy. I was curious about how she could make it to join this study group and follow the MOOC schedule. It is an interesting thing to think about.

Researcher A: Do you mean thinking about how others manage their time – how does she add MOOC study to her schedule as she was already so busy?

Sue: Yes, yes. Moreover, MOOC is not a mandatory task imposed by others. I was asking myself whether I was really willing to do this under tight schedule – particularly when the MOOC study was not compulsory. (Week 4 study group)

Secondly, social comparison had helped participants relieve their inner pressure and uncertainty, especially when they knew that “we are all in the same shoes.” The following excerpts detail a participant's feeling of relief when she heard about others' similar situation. Also the excerpts demonstrate the importance of speaking out worries and apprehensions to others:

I was sitting beside Mary, and I heard that she wanted to give up. I just realized that everyone had the same feeling as mine, and I felt a huge relief. First of all, I found that we were all the same [not just me that are under difficult situation]; But secondly, I found everybody still kept going. What I thought was that, if others can do it then I can do it, too. (Lisa, interview)

Lisa: I felt that if I did not speak out my feeling, then all of you would not see me again. I wanted to let you know that I almost reach my limit. Then, if I give up and suddenly disappear you will know what happened to me. I was surprised to hear you [Mary] say that you almost gave up, too. After second thought, I felt the situation was not as serious as I originally thought of.

Mary: It is not only you that encountered the difficulty. I think it is important to speak out you apprehensions. If you speak it out you will find that we all have the same feeling ... But not many people would speak them out, especially Taiwanese people. (Week 3 study group)

The third salient theme under social comparison was *positive competition*. Here it means that when participants observed others' positive goals and better performance they reminded themselves not to fall behind. In a previous excerpt, Lisa thought that "if others can do it then I can do it, too" when she heard others were under difficulty but still kept going. The same student also recalled her impression on other group members during the first group meeting:

"During that meeting I found others were so proactive. For example, many of them had started working on next week's assignment, then I thought that I should catch up as soon as possible ... so I think the study group has the function to push you forward." (Lisa, interview)

Another student, Sue, also repeatedly mentioned unwillingness to fall behind when comparing her own status with peers. She also stressed the importance of face-to-face meetings to gain momentum, as such gatherings provided rich opportunities to approach others' attitudes and learning status in person. This adds evidence to the above mentioned Affective gain that "study together" itself had exerted influence on the MOOC students.

When you sit in front of the computer [by yourself] you know there are numerous students enrolled in this MOOC course, but you do not know their attitudes and mindsets. But when you see your classmates face-to-face [i.e., this study group] you really know that they are doing the same thing as you. So my motivation became stronger: I cannot find excuses. I should finish [the assignments] and should not fall behind of them. (Sue, interview)

Sue: After one or two study group meetings I found others completed the course assignments without setting high goals. Ironically, I once had high goals but was considering giving up. Then I thought I should at least finish those assignments.

Researcher B: Does it mean that you didn't want to fall behind of others?

Sue: Yes, something like that. (Sue, interview)

3.3. RQ3: What are MOOC students' suggestions to improve the face-to-face study group?

As this was our first attempt to launch a MOOC study group, we asked the participants about their suggestions for improving the study group design. Participants suggested announcing weekly discussion topics in advance so that group members could be better prepared for the next face-to-face gathering. They also recommended reserving more time for group members to work together on their course assignments. Lastly, participants recommended increasing the amount of online interactions, such as providing resources that group members can directly access when they study alone with the computer.

Interestingly, for the last suggestion we did create a private Facebook group as an asynchronous complement for participants to extend interactions and share learning resources. Nevertheless, the Facebook postings were quite slow during the study group sessions. When being asked about the reasons why they did not use Facebook frequently, participants answered that they did not perceive Facebook communication indispensable because to much extent it overlapped with our face-to-face meetings. Participants would preserve their precious time for face-to-face gathering instead of going online for virtual communication.

Furthermore, participants overwhelmingly preferred face-to-face study group meeting over online discussion due to its efficiency, immediacy, and higher levels of interactivity and social presence. In the following excerpts one stressed that she preferred face-to-face meetings because they provided more social presence and reduced the chance of miscommunication online. Lastly, one participant recommended choosing/mixing face-to-face meetings and the Facebook group based on the purpose of the study group.

If we see each other onsite we can express thoughts immediately. Meeting face-to-face won't have such a gap ... the expressional gap. (Mary, week 6 study group)

I still think that face-to-face is better. Many things like discussion materials can be exchanged directly, and we can view it on site. Moreover, I had been meeting online and felt it inefficient to type texts. Conversely, face-to-face meeting allows us to make good use of the limited time to discuss the topic and reach consensus together. (Sue, week 4 study group)

If you want to promote the frequency of Facebook usage, maybe you can reduce face-to-face meeting time or extend the time span between two study group meetings. However, if your main purpose is to promote interactions and knowledge sharing, I still think meeting face-to-face is more effective. (Lisa, interview)

4. Discussion and implications

4.1. Perceived gains

In this study we identified participants' perceived gains in multiple aspects. Cognitively, study group participants broadened their perspectives, raised cultural awareness, and absorbed learning/coping strategies. Affectively, the MOOC students generated more impetus for learning, and they disclosed apprehensions and worries that relieved inner pressure and dropout intentions. Participants became more

active trying out new courses and learning strategies, and they became more willing to formulate study groups of their own. The above results align with [Zevenbergen's \(2004\)](#) study in terms of broadening perspective, enhancing motivation, reducing dropout intentions, and maintaining ongoing interest in study groups. Our findings also echo [Li et al.'s \(2014\)](#) study that the “study group way of learning with MOOCs” was more effective and motivating than individual learning. This study supports that the “Joint a Meetup Group” design of Coursera would be a practicable and potentially effective approach to leverage MOOC students' motivation, engagement, and deeper learning.

Contrasting study groups in traditional classroom contexts, MOOC study groups have a unique potential to raise students' cultural awareness and international perspectives. In the MOOC context, courses are offered by high-ranking universities across the globe, and students come from all over the world with diversified knowledge, belief, and cultural bearings. These are invaluable assets of MOOCs. One participant in our study group expressed that she really appreciated this MOOC study experience to “connect to the whole world,” and it was her first time to feel that she was part of the global village. As such, we recommend future MOOC-based study groups to guide participants to actively participate in the course discussion forums, and observe/interact with international students with different voices and perspectives.

[Margaryan, Bianco, and Littlejohn \(2015\)](#) analyzed the instructional design quality of MOOCs. Of the seventy-six randomly selected courses, only 16 courses required learners to contribute to collective knowledge. Worse, only eight courses contained learning activities that required participants to collaborate, and only two courses asked learners to interact with each other outside the course. Such results urge us to rethink the design model of MOOCs from pedagogical viewpoints. Based on the results of the present study, we recommend MOOC designers and course instructors to incorporate activities or assignments that require student interactions and collaborations, and shape a learning environment wherein cultural diversity is appreciated and leveraged for learning. Such initiatives may further encourage implementation of study groups in the online or face-to-face contexts.

4.2. Challenges

While not specifically designed into our research questions, we had tracked challenges of the study group by taking observation/reflection notes. Contrasting the [Li et al. \(2014\)](#) study wherein students took the courses on campus for credit and studied MOOCs as the mandatory flipped classroom component, joining the study group and studying *Red Chamber Dream* was completely voluntary (i.e., it took extra time without getting credits; group members were free to stay or leave) in this study. What is more, the *Red Chamber Dream* course started at the mid-term and ended in the last week of the semester, which was usually scheduled for final exams for regular university courses. As such, participants needed to spare time for their MOOC study while keeping up with their existing courses and the final exams. The lack of external rewards and the extra loading of the MOOC study had challenged students' motivation to continue, as well as the researchers' facilitation of the MOOC study group.

For example, finding a common time to meet was difficult due to participants' busy schedule, which has also been pointed out by [Rybczynski and Schussler \(2011\)](#). To compromise, we decided to meet at restaurants or cafeterias during lunch time or tea time break. While the “eat and meet” multitasking approach was useful to create a relaxed atmosphere to talk (and perhaps the varied types of food had also provided some incentives for the participants to come), somewhat it had limited our depth of sharing within the 2-h meeting time. Furthermore, at times the ambient noise became too loud, and some restaurants did not have the Internet and large tables for us to retrieve and discuss MOOC course materials with laptop computers. In the future, finding a fixed and quiet place with large tables and stable Internet would be our first priority to ensure the quality of face-to-face study group discussions.

Another challenge regards facilitation of study group discussions wherein members were of different traits, dispositions, and self-expression skills. While some members were fluent in articulating ideas, some were not. During one study group meeting a quieter participant disclosed that she “thought slowly” and needed more time to organize her thoughts. Another participant seemed to have the “jump thinking style,” and sometimes we found it difficult to grasp what she really meant. As such, we restated and double checked their answers or provided probing questions for them to elaborate on their previous narrations. Sometimes we needed to moderate opportunities to talk (e.g., everyone takes turns sharing) so that every member had a chance to express themselves, as opposed to letting someone dominate the whole discussion topic. It is therefore not surprising that we had as many as 104 coded instances of the “Clarifying ideas/raising questions” facilitation category in [Table 3](#). As suggested by our participant, in the future we may announce discussion topics or guiding questions in advance so that participants can be better prepared for the face-to-face discussion and sharing.

4.3. Sense of community

Sense of community and *social comparison* were found as critical influential factors of this MOOC study group. *Sense of community*, as defined by [McMillan and Chavis \(1986\)](#), is “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together” (p. 9). Through finding answers and resolving problems together, and via openly sharing and exchanging inner thoughts and concerns, participants built trust and interdependence with each other, and they encouraged each other when someone encountered difficulties. It was also such sense of community that made participants feel that the study group had become part of their lives, and they became more active in sharing information and ideas. In the end, such sense of community strengthened their engagement and alleviated their dropout intentions.

In accordance with our positive results, past online learning studies also showed that feelings of community increased learner persistence, precipitated flows of information, strengthened commitment to group goals, and brought about greater sense of well-being ([Rovai, 2002a, 2002b](#)). [Chen and Chiou \(2014\)](#), after a review of literature, concluded that “a participants' feeling of belonging is likely to have a major impact on learning outcome and satisfaction, whether in traditional or online courses” (p. 489). It follows that building senses of community need to be placed at the center of the planning and implementation of study groups. Effective facilitation strategies should thus be explored and validated to establish mutual trust and interdependence among study group members.

Looking back, the study groups' community building could be partly ascribed to our ways of facilitation. We strived to maintain an open and non-judgmental atmosphere wherein everyone's sharing were welcomed and valued. At times the researchers set examples by sharing inner thoughts, feelings, as well as success and failure experiences to encourage self-disclosure among participants. Furthermore, participants enjoyed the autonomy but also assumed responsibility in selecting a course to their common interest (i.e., *Red Chamber Dream* on

Coursera), the time interval between study group meetings, as well as ways of interactions/division of labor among group members. Such autonomy and shared interest of group members have been found to relate positively to individuals' sense of community in the [Obst and White \(2007\)](#) study: “the highest sense of belonging was seen in the self-chosen interest group, indicating that choosing to belong to a community of people with similar interests resulted in a greater feeling of belonging to that community” (p. 86). Future study groups may address learner autonomy, at the same time facilitate discussion topics and activities to the common interest of group members.

4.4. Social comparison

Social comparison theory ([Festinger, 1954](#); [Suls & Wheeler, 2000, 2012](#)) posits that individuals are motivated to seek for social comparison in order to reduce uncertainty about their own status (e.g., abilities or attitudes). In this study, social comparison motivated our participants to reflect upon their self-goals; it also helped them release uncertainty and pressure especially when they knew others were in the same situation. More frequently, social comparison inspired our participants to catch up with other group members in terms of completion of class readings and the course assignments. (e.g., “*I found everybody still kept going. What I thought was that, if others can do it then I can do it, too*” Lisa, interview). Overall, we deem that social comparison had brought positive effects on student motivation, engagement, and group dynamics in the present study.

More specifically, our participants had demonstrated the “*upward-identification*” type of social comparison ([Molleman, Nauta, & Buunk, 2007](#)), which means that individuals identify with more competent others and believe that they can be as good as those better performing teammates. With perceived control over their improvement, individuals are more likely to seek information to improve themselves; also they are more likely to possess positive and constructive attitudes toward their teammates such as regarding them as role models ([Smith, 2000](#)). In the [Molleman et al. \(2007\)](#) study, students with upward-identification thoughts portrayed higher interpersonal trust with their teammates. They also achieved better individual learning outcomes as measured by the degree to which they attained the specified learning goals.

Yet, the effects of social comparison are not always beneficial. The “*Upward-contrast*” social comparison (e.g., “*I will never be as good as those better performing teammates*”) may incur anxiety, intimidation, and feelings of hopelessness that undermine individuals' motivation, engagement, and even self-esteem. In [Micari and Drane \(2011\)](#) study, students felt intimidated not being able to keep up with others in the groups, and they failed to participate fully or even dropped the program. [Molleman et al. \(2007\)](#) also found negative correlation between upward-contrast thoughts and learning outcomes. In the [Zevenbergen \(2004\)](#) study, the knowledgeable young teachers' strong senses of ego and competitive ethos (e.g., thinking that “*Others are inferior to me,*” which fell into the *downward-contrast* category) had posed threat to group harmony and collaboration.

Now that social comparison is inevitable in our daily lives and particularly in the group interaction processes, and since social comparison may either support or hinder group dynamics and learning outcomes, educators should take it into careful consideration when designing and implementing study groups. In [Micari and Pazos' \(2014\)](#) study, helping students understand the malleable nature of intelligence and clarifying that others have struggled academically and succeeded had been validated as effective interventions to reduce students' social comparison concerns. Here we further suggest several strategies that may help attenuate the side-effects of social comparison:

1. Encourage group members to set achievable mastery/learning goals as opposed to performance goals;
2. Facilitate group members to monitor their self-regulation ([Barnard et al., 2009](#); [Zimmerman, 2002](#)) process to accomplish their own learning goals;
3. Address the virtues of multiple intelligence and allow every group member to be “outstanding” in different areas; and,
4. Help group members reflect upon their feelings of joy, challenge, and accomplishment ([Vallerand et al., 1992](#)) during the learning process, so that their intrinsic motivation ([Deci & Ryan, 1985, 2002](#)) may thrive.

More fundamentally, building trust and mutually supportive atmosphere among group members may bring more positive and enduring effects. As suggested by [Molleman et al. \(2007\)](#), interpersonal trust with teammates may be linked to “upward-identification,” the positive social comparison. Evidenced by the present study, constructive group interactions helped broaden perspectives, share learning strategies, and promote positive competition (i.e., upward-identification) among group members. Such results remind us of the criticality of *sense of community*, particularly its central role in promoting healthy and vibrant study group processes.

5. Limitations and future directions

The present study is our initial attempt to explore MOOC students' perceived gains from the weekly face-to-face study group. Owing to the limited number of participants and by the nature of case study, findings are hardly generalizable to other MOOC student groups, especially those from other geographical and cultural areas. Instead, based on the cultural differences found in this study, we recommend more research efforts to explore study group dynamics, perceived gains and challenges, and key influential factors across culture. Such efforts would help detect the communality and differences among diversified study groups, thereby shed light on general design principles and culturally specific facilitation strategies to maximize motivation and learning for every MOOC student.

Furthermore, based on student feedback to improve the study group, and also inspired by the [Li et al. \(2014\)](#) study, in the next phase of study we will reserve time for video watching and/or letting group members to work together on the course assignment (without prejudice to the honor code). As study groups can take different formats such as student take turns leading (e.g., [Van Der Karr, 1994](#)) or inviting subject matter experts to co-facilitate (e.g., [Schmidt, 1994](#)), future studies may explore their practicality in the MOOC study context. Lastly, despite that the Facebook group has become a common tool for collaborative learning and informal interactions ([Mazman & Usluel, 2010](#); [de Villiers & Pretorius, 2013](#); [Wang, Woo, Quek, Yang, & Liu, 2012](#)), its usage had been minimal in the present study due to its overlap with face-to-face gatherings. Future design may find a good mixture of Facebook and face-to-face meetings so that their roles become *complementary*. Particularly, formal and informal learning (see [Van Der Karr, 1994](#); [Zevenbergen, 2004](#)) can be tacitly blended to promote group interactions, sense of community, and expected learning outcomes.

Learners need support, guidance, and connections to thrive, and it is no exception in the MOOC learning environment. This paper documents our facilitation strategies, participants' perceived gains, and critical influential factors of the MOOC study group. Our results provide evidence that study group may serve as an ideal approach to help MOOC learners develop requisite skills, share feelings and thoughts, and strengthen their self-determination to continue. We hope that this study will shed light on future design and implementation of MOOC study groups, as well as inspiring more research in this direction.

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