Social Learning Perspective of Educational Technology

7

Chapter Outline

- Social learning
- Features of technology in social learning
- Building learning communities/group
- Analysis and measure group learning.

By the End of This Chapter, You Should Be Able To

- Clarify the definition of social learning
- Build and manage a learning community
- Conduct interaction analysis through social network analysis and content analysis method.

Main Learning Activities

1. According to your own experience, describe a social learning experience and your own perceptions as well as summarize the advantages of social learning. Think about what are the differences among a social learning approach, behavioral, and cognitive approaches.
2. Describe a learning community with which you have been involved and state what makes a learning community. You can use this class as an example if you have no other option.
3. Think about why technology is essential in social learning. What kind of roles technology can play to promote social learning, and describe a social learning scenario for the applied technology?
4. Think about how to build and manage learning group in a classroom if you are a teacher?

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5. Think about how to measure group learning performance. What kind of components should be considered? Do think how to measure and evaluate group work in this course?

7.1 Introduction

Social media is changing communication between individuals and organizations. People can now enjoy a new type of learning by integrating social media. With the aid of the Internet, learners can get access to courses, instructional materials, and co-learners anytime and anywhere. In addition, learning with social media can provide a high degree of interactivity among participants who are separated both geographically, temporally, and culturally. Social media afford students many of the benefits of face-to-face interaction without the need to travel to specific places at specific times.

In this chapter, we will introduce educational technology from the perspective of social learning and discuss the roles of technology in social learning, describe ways to build and manage learning community, and indicate methods to measure group learning.

7.2 Social Learning

7.2.1 Definition

Social learning was proposed by Bandura (1962), who believed people learn from others through observation, imitation, and modeling (Bandura, 1962; Bandura & Walters, 1963). For example, when a child sees one is punished for stealing, the child knows stealing is bad behavior. However, Bandura's definition does not emphasize the social context that is often important for learning (Reed et al., 2010). Wenger (1998) describes social learning as active social participation in a community of practice. Wenger and others stress the dynamic interaction between people and the context as they construct meanings and develop identities (Muro & Jeffrey, 2008). In a sense, this is an extension beyond behaviorism and cognitivism to take into account the influence of others and the context (Reed et al., 2010).

Reed et al. (2010) analyze social learning in terms of individual understanding, a community of practice, and social interactions in that community as follows:

> Social learning may be defined as a change in understanding that goes beyond the individual to become situated within wider social units or communities of practice through social interactions between actors within social networks (p. 6).

7.2.2 Benefits of Social Learning

Social learning emphasizes the fact that individuals learn from social interactions in communities and groups. When students act as a part of a group, they can gain experience during collaboration and develop the important skills of critical thinking, self-reflection, and co-construction of knowledge (Brindley, Walti, & Blaschke, 2009). Specific benefits of social learning can be summarized into four major categories: social, psychological, academic, and assessment as follows (Laal & Ghodsi, 2012):

Social benefits:

- *Contributes to the development of social support system for students.* Learners work in groups or communities through social learning, so they could get suggestions and information from others to deal with questions and problems.
- *Helps to build various understanding among learners and instructors.* The different experience of learner would result in various understanding to same things. Positive relationships between different kinds of people are encouraged in social learning to develop broad perspective and understanding.
- *Establishes a positive atmosphere for collaboration*. Learners participate in peer interactions usually hold a positive attitude and motivation that lead to active social responses to problems and results in a friendly environment.

Psychological benefits:

- *Student-centered instruction increases students' self-esteem.* In a social learning setting, instruction is learner-centered; learners are responsible for conducting inquiries, applying knowledge, and making meaning of new concepts.
- *Cooperation reduces anxiety.* In social learning setting, learners are usually in supportive environments to manage conflict resolution and get help to solve problems.
- *Develops students' positive attitudes toward teachers.* In a social learning setting, the environment is open, which allows a teacher to have smooth conversations with students. In addition, teachers can better know students and give proper guidance.

Academic benefits:

- *Classroom results are improved.* Compared with face-to-face teaching, students in social learning deliver more complete reports, make higher quality decisions, and perform better on complex tasks that require groups to generate ideas and solutions.
- *Critical thinking skills are promoted.* When a learner interacts with others, the learner can analyze information from a broader perspective, which could improve his/her critical thinking skills.

- *Students are actively involved in the learning process.* The learner is the center in a social learning context, so learners own the responsibility for learning. They are actively involved in the learning process and more likely to be interested in learning.
- *Problem-solving techniques are enhanced.* When students work in pairs or small groups, one person is listening, while others discuss the question under investigation. All involved are developing valuable problem-solving skills by formulating and discussing ideas while receiving immediate feedback from co-learners.

Assessment benefits:

- *Collaborative teaching techniques utilize a variety of assessments.* In social learning settings, the instructor has more chances to interact with students. Thus, instructors can assess students based on the quality of interactions in addition to exams and other artifacts.

7.2.3 Features of Technology in Social Learning

Nowadays, technology plays a vital role in social interactions. Example technologies include Facebook, Friendster, LinkedIn, MySpace, Ning, Twitter, and WeChat. These tools involve large-scale networks and the ability to interact in and contribute to large groups. Blogs and wikis are also used but lack many of the benefits of social media tools (Spector, 2015).

Social media is beneficial in promoting social learning, such as providing community platforms, learning resources and contents, and learning activities. Resta & Laferrière (2007) summarize the features of technology in social learning as follows:

To promote student collaboration and knowledge creation. Collaboration can be thought of as the process of shared creation (Schrage, 1990). With the interactive nature of technology, students can communicate with others conveniently and represent knowledge clearly, which results in students' active and deep engagement in collaboration.

To enhance student cognitive performance or foster deep understanding. Social interaction is considered as a source of cognitive advancement (Resta & Laferrière, 2007). With the help of technology, students could get smooth communication with each other. For example, mind management tools and concept maps can help present ideas clearly to support reflective thinking and deep understanding.

To add flexibility of time and space for social learning. The virtual workspace has been increasing its popularity in people's daily life. Students can finish their work in different place and time; thus, they can overcome the trouble of place and time. For example, in MOOCs, although students come from different countries, they can work together because of virtual space provided by the course.

To promote student engagement and keep track of student collaboration. Learning analytics and big data are useful in monitoring learner progress. Many learning platforms can track and analyze the behavior and learning processes to monitor and predict student's achievements and recommend interventions to promote learning.

7.2.4 Social Learning and Computer-Supported Collaborative Learning

There is an obvious relationship between social and collaborative learning as suggested. In addition, when technology is added to the mix, the relationship of computer-supported collaborative learning (CSCL) and social learning is worth highlighting (Scardalmia & Bereiter, 1994, 2006). Key aspects of CSCL build on Vygotsky's (1978) social development theory and incorporate Stahl's (2006) collaboration to suggest a pedagogical approach that emphasizes he shared construction of knowledge and understanding.

7.3 Building and Managing Learning Communities and Groups

7.3.1 The Five Stages of Group Development

Before building a group, how a group develops should be understood. Effective group development follows a structured process. Tuckman (1965), Tuckman and Jensen (1977) summarized that process regarding five stages: forming, storming, norming, performing, and adjourning (Fig. 7.1).

Forming: People with same goals come together, and they need to know the similarities and differences of the team members. The critical thing at this stage is to let members becoming familiar with each other and their task. Discussing the scope of the effort, formulating the methods to deal with the task, and establishing the rules of engagement are relevant at this stage.

Storming: When the group attempts to accomplish a task, conflicts about responsibility, division, or rules may surface. The important things at this stage are listening to others, clarifying ideas, finding solutions, and testing ideas.

Norming: When the group overcomes a conflict, the members become more actively engaged and more involved in sharing information, maintaining community, and solving new issues. The important thing at this stage is group awareness that the group is effective. Indicators of group effectiveness at this stage are the clarification of interaction processes and taking actions to address problems.

Performing: When the group reaches this stage, members are genuinely interdependent, and the group has developed a real unity. Group members are highly oriented to tasks; they collaborate smoothly and play different roles according to the

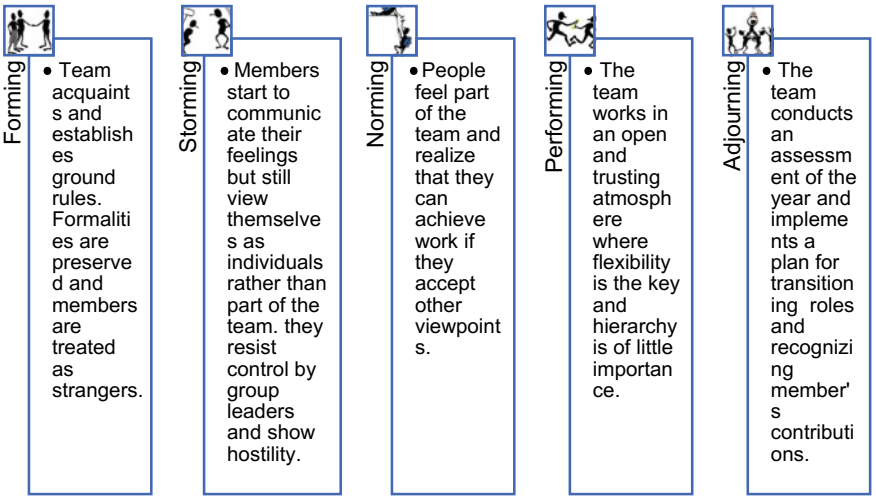

Fig. 7.1 Development process of the group. Adapted from https://c228online.wikispaces.com/Group++A+-+Group+Development

group needs. The important thing at this stage is solving problems in the best way to promote group development. Not all group can reach this stage.

Adjourning: The group is not always active or developing. A group can be terminated when the task is over or when the group disbands for any reason. The important thing at this stage is concluding the achievement, recognizing member's contributions, and giving members the chance to say good-byes to each other.

Group development is not always linear. The group process can loop back to storming when there are unsolved conflicts, or when new members join or difficulties in understanding tasks arise. Establishing rules of engagement in early stages of a group development will help when the group encounters problems in later stages.

7.3.2 Building and Managing Small Groups

In a classroom environment, grouping has multiple possibilities. The person who will decide the grouping (students, teachers, or randomly assigned), depends on the task setting and group characteristics. Before considering the grouping, the group size should be determined. The ideal size of the group depends on the purpose and content of classroom teaching, but it is generally considered that four to five people are optimal. Several issues should be considered in determining the number of groups (Dreyer & Harder, 2009):

- *How long does it take for a group to learn?*
- *How much experience have the students had?*

- *How old are the students?*
- *What materials are available for students to use?*
- *How comprehensive are these materials?*

After the group size is determined, different methods can be applied. Dreyer and Harder (2009) proposed four methods to build groups in classroom settings.

- *Randomly*
- *According to scores*
- *According to interest*
- *According to feelings.*

When students are grouped, there is often a situation where someone is not included; the teacher needs to persuade the group to accept those students not already included in the group. Therefore, the task of grouping is often done by the teacher. Whichever grouping method used, students should be given a chance to change to another group. If students have the opportunity to participate in the selection of partners, their acceptance of learning with their partners will also increase. Thus, the freedom to change partners will play a positive role in promoting student participation.

After the team has been identified, the role of each team member in accomplishing the task needs to be clarified. Through this clear division of labor, the team can work together to enhance their confidence. In addition, the role of team members can vary depending on the task.

7.3.3 Building and Managing Communities

Learning communities provide necessary support for social learning. Learners interact with others in learning community and group to form social relationships. However, the establishment and management of a learning community need time and effort and follow the group development law. Essential elements for establishing prosperous learning communities are informality, familiarity, honesty, openness, heart, passion, dialogue, rapport, empathy, trust, authenticity, disclosure, humor, and diverse opinions (Chapman, Ramondt, & Smiley, 2005). According to the five stages to build a projected course by Waltonen-Moore et al. (2006), we propose the four stages of building and managing learning community:

1. *Introductions*—This step is a getting-to-know-you phase. Some methods, such as self-introduction and ice-breaking tasks, can be used to create an initial and emotional connection with others in the community.
2. *Involved within the group*—This step is a deeper understanding of group as a part of group. Some methods, such as making group rules and clarifying task division, can be used to make a deeper connection between individuals and the group.

3. *Form primary Interact*—This step is a normalization phase. The individuals in the group begin sharing information with each other, for example, discussing the course contents. Some methods, such as providing feedback on interactions, can be used to promote interaction between the groups.
4. *Promote real collaboration*—This step is a real collaboration phase. The individuals begin to confirm their ideas and actively reflect themselves. Some methods, such as writing reflection, can be used to enhance group members' collaboration.

7.4 Analysis and Measure Social Learning

The ability to measure and to appreciate the complexity of the processes of social learning has benefited from advances in methodologies and development of computational power.

7.4.1 Social Interactions

Individuals' interaction pattern is an important assessment element of social learning. When people interact with each other, a social network is forming. The social network is a social structure made up of individuals (or organizations) called "nodes," which are tied (connected) by one or more specific types of interdependency, such as interaction, friendship, and kinship (shown as Fig. 7.2).

Assessment of social network should use a method named social network analysis. According to the constitution of social network, social network analysis usually focuses on several key terms, such as sociogram, density, centrality, in-degree, and out-degree (Cho et al., 2007; Jaewoo & Woonsun, 2014; Martınez et al., 2003).

Sociogram is the visualization to show the situation of the whole or the part of the social network (shown as Fig. 7.3). In the sociogram, the node represents the actor, the line represents the relationship between actors, and the arrow direction represents the information flow (Haythornthwaite & De Laat, 2010).

Density describes the connection degree of a network. It refers to the number of ties an actor has, divided by the total possible ties an actor could have (Haythornthwaite & De Laat, 2010). For example, if there are ten actors, each actor could potentially have nine ties that means the actor could potentially connect to other nine actors. If an actor has six ties, the density of the network is 66.67% (6/9). The bigger the number of density stands, the better the connection of the network.

Centrality describes the numbers of ties an actor has. The more ties an actor has, the higher centrality it is. When the network has direction, there are two indicators to explain centrality: in-degree and out-degree. For example, if actor A comments on actor B, then the direction between them is A point to B, so out-degree can be

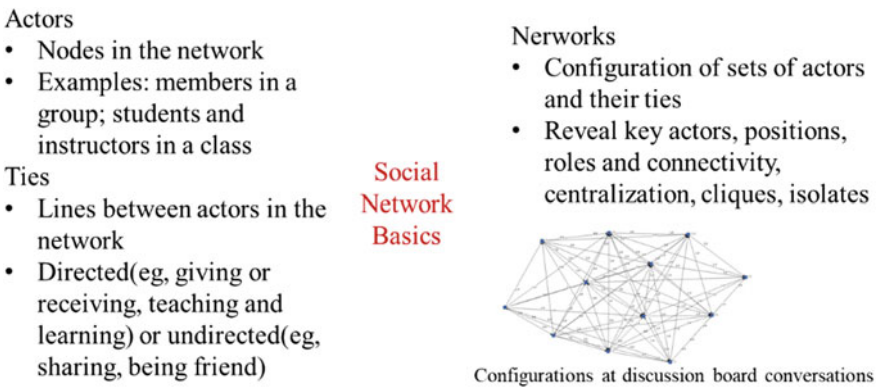

Fig. 7.2 Social network basics. Adapted from Haythornthwaite and De Laat (2010)

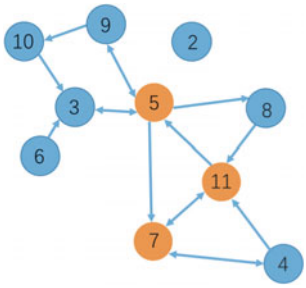

Fig. 7.3 A sample sociogram

used to describe actor A (because it is the one commented) and in-degree can be used to describe actor B (because it is the one who received comments). If an actor has higher in-degree, it means the actor receives more information; if an actor has higher out-degree, it means the actor provides more information (Russo & Koesten, 2005).

Case 1 Social interaction analysis of an online English-to-Chinese cooperative translation activity

Yang, Guo, & Yu, (2016) analyzed the social network of online English-to-Chinese translation activity. The participants are 48 sophomores majoring in educational technology at Jiangsu Normal University. They were randomly assigned to twelve groups of four students. The network formed by the group's interaction was directed.

Figure 7.4 illustrates the social network of sociogram. From a sociogram, we can see each group has a connection, which means groups could communicate with other groups without obstacles.

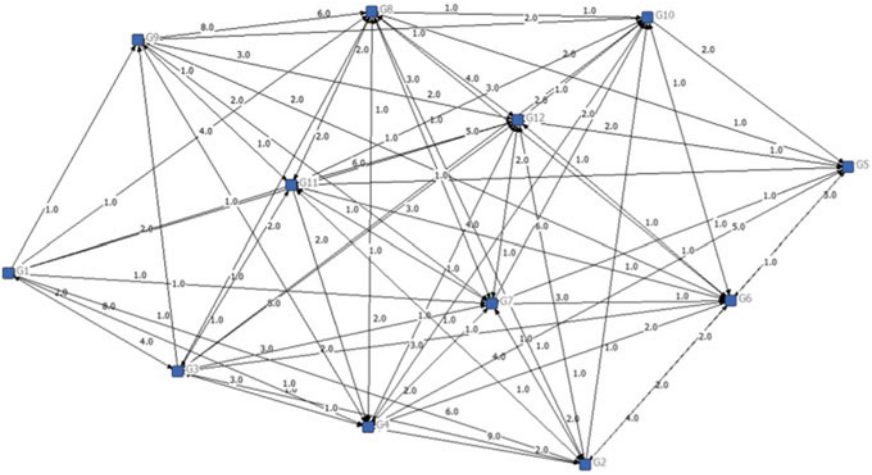

Fig. 7.4 A sociogram generated from an online social network

The density of this sociogram is 0.65, which means it is a high-density network. Groups in the network are in touch with most of the other groups, and the information can flow freely among different groups.

Table 7.1 indicates that Group 4 is most active in sharing information and has a strong influence on the network. Group 2 receives the most information but has a minimum of sharing. That is to say, Group 2 is in control of other groups and has little influence on others.

7.4.2 Content Analysis

When individuals interact with each other, especially discussing and chatting, the understanding of the content could become deeper within the interaction. The social interaction is usually related to knowledge building.

Knowledge building can be considered as a form of deep constructivism (Scardamalia, 2002). Scardamalia and Bereiter (2006) defined knowledge building as the production and continual improvement of ideas of value to a community that involves individuals and groups coming to a deeper understanding through interactive querying, discussing, and continuing improvement of ideas. It is worth noting that this notion of deep learning by educational psychologists and

Table 7.1 Degrees of each group in the network

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	Mean	Std. Dev.
Out-degree	12	7	17	30	12	23	19	25	13	12	14	24	17.33	6.59
In-degree	16	29	21	14	11	10	18	19	20	12	22	16	17.33	5.15

technologists is different from what computer scientists and artificial intelligence researchers call deep learning in the context of machine learning.

Content interaction is usually measured by content analysis, which is a method to analyze the procedures with text (Rourke, Anderson, Garrison, & Archer,2001). The text usually includes chats, discussion boards, and log file data. The content analysis includes three steps: (1) adopting a coding scheme, (2) coding the text, (3) analyzing the results.

Case 2 Content analysis of a collaborative inquiry learning among four elementary schools in China

Zheng (2017) analyzed the final products of a collaborative inquiry activity. The participants are 196 pupils from 4 classes in four elementary schools in China. The pupils were randomly assigned to the groups of four or five.

At first, Zheng (2017) selected the coding scheme proposed by Zhang et al. (2011) to analyze the level of knowledge building. The scheme includes scientificness and complexity, as shown in Table 7.2.

In order to make sure the coding is credible, two raters coded all the discussion text independently. The raters compared the coding, and Zheng calculated the inter-rater agreement that achieved 0.91.

Finally, Zheng (2017) calculated the percent of each knowledge level. The result is shown in Table 7.3.

Regarding scientificness, the result indicated that 0.4% of the discussion transcripts were prescientific, 1% of them were hybrid, 18.6% of them were basically scientific, and 64% of them were scientific. Zheng (2017) concluded that most learners had acquired scientific knowledge about tools in daily life.

In complexity aspect, the result demonstrated that 16% of discourse transcripts were unelaborated facts, 67.3% of them were elaborated facts, only 0.9% of them were unelaborated explanations, and 15% of them were elaborated explanations.

Table 7.2 Coding scheme of knowledge building

Code		Explanation
Scientificness	Prescientific	Contains misconception and naive conceptual framework
	Hybrid	Contains misconception and some scientific information
	Basically scientific	Not precise, but applies the scientific framework
	Scientific	Consistent with scientific knowledge
Complexity	Unelaborated facts	Simple statements
	Elaborated facts	Elaboration on terms, phenomena, etc.
	Unelaborated explanations	Includes reasons, relationships, or mechanisms
	Elaborated explanations	Elaborations on reasons, relationships, or mechanisms

Table 7.3 Results of knowledge building

Code		Percentage (%)
Scientificness	Prescientific	0.4
	Hybrid	1
	Basically scientific	18.6
	Scientific	64
	Others	16
Complexity	Unelaborated facts	16
	Elaborated facts	67.3
	Unelaborated explanations	0.9
	Elaborated explanations	15
	Others	0.8

Zheng (2017) concluded the finding indicated that most learners could elaborate terms, phenomena, and facts. However, only a few of them can provide elaborated explanations about tools in daily life. Zheng suggested that the teachers should provide more elaborated explanations to deepen the understanding of tools in daily life.

7.4.3 Cognitive Task Analysis

In addition to analyzing the content to be learned, it is often useful to analyze performing tasks and solve problem related to that content. Cognitive task analysis (CTA) is a well-established technique for doing such an analysis (Clark & Estes, 1996). CTA makes use of observations, interviews and talk-aloud techniques to extract both explicit and implicit experiences in solving problems and making decisions pertaining to the content to be learned. Common methods used in CTA include collecting preliminary knowledge (e.g., via document reviews), identifying relevant knowledge representations (e.g., in the form of concept maps or causal influence diagrams), applying knowledge elicitation techniques (e.g., interviews and think-aloud methods), and developing the results in a manner suitable for testing with less experienced persons. One key aspect of a cognitive task analysis is to identify key distinctions and decision points that influence what a problem solver or decision maker does.

7.4.4 Group Performance

The traditional assessment methods, such as final tests, submitting artifacts or products are adopted to analyze the group performance. Through these assessments, we can infer what they know, can do, or have accomplished in general (Mislevy et al., 2003).

A final test is a traditional method to evaluate the knowledge of learners. In the practice situation, making artifacts or products has been the standard assessment methods. The steps of product evaluating methods are similar to content analysis; both of them need to adopt an evaluation scheme. After that, products should be assessed according to the scheme.

Case Products evaluation of a collaborative inquiry learning among four elementary schools in China

Zheng (2017) analyzed the final products of a collaborative inquiry activity. The participants are 196 pupils from 4 classes in 4 primary schools in China. The pupils in each class were randomly assigned to the groups of four or five. Finally, 48 groups were formed.

At first, Zheng (2017) chose the coding scheme proposed by Lai and Hwang (2015) to analyze the submitted products of learning groups. The scheme includes word, space, color, and theme. Each dimension is separated into three levels, shown at Table 7.4.

Zheng (2017) evaluated the final products of groups according to the scheme and analyzed the means and standard deviations of group products. The results indicated that all of groups made great efforts to collaboratively draw the artifacts. Figure 7.5 is an example of the final products of groups.

Key Points in This Chapter

(1) Social learning can be considered as a change in understanding that goes beyond the individual to become situated within wider social units or communities of practice through social interactions between actors within social networks.
(2) Benefits of social learning can be summarized into three major categories: social, psychological, and academic.

Table 7.4 Criteria for group products

Dimension	3	2	1
Word	The size of the heading is large, and the text has rich decoration	The size of the heading is not large, and the text has some decoration	The size of the heading is too small, and the text has no decoration
Space	The distribution of the space is fine	The distribution of the space is not good enough	The distribution of the space is messy
Color	The product is colorful, and the color is appropriate	The product only contains two colors	The product is boring
Theme	The content of the product is consistent with the theme	Part of the content is consistent with the theme	The content of the product is not relevant to the theme

Fig. 7.5 Example of group product about Chinese brush (used with permission from Zheng)

(3) Features of technology in social learning can be described to promote student collaboration and knowledge creation, enhance student cognitive performance or foster deep understanding, add flexibility of time and space for social learning and promote student engagement and keep track of student collaboration.
(4) The group development process can be described based on the five-stage model: forming, norming, storming, performing, and adjourning.
(5) Building learning community usually includes five steps: introductions, identification with the group, interaction, group cohesion and individual reflection, and expansive questioning.
(6) Group performance can be measured and analyzed in three aspects, namely social interactions, content interaction, and group product.

Learning Resources

- The Centre for the Study of Higher Education explores some of the benefits and challenges of group work, including group formation, group processes and procedures and assessment. Web site: https://www.sheffield.ac.uk/lets/toolkit/teaching/smallgroup

- Making group-work work: practical examples of engaging students in technology-basedsocial learning, Web site: https://www.sheffield.ac.uk/lets/cpd/conf/conf/conf12-9
- Making small-group teaching work. Race, P. (2006). The Lecturer's Toolkit: 3rd Edition London: Routledge. Web site: http://phil-race.co.uk/downloads/
- Approaches to small group teaching. Gunn, V. (2007). University of Glasgow. Web site: www.gla.ac.uk/media/media_12157_en.pdf
- Teaching Methods: Small Group Teaching The University of Nottingham offers a series of video interviews with academic staff on different teaching issues, including teaching small groups. Web site: http://www.nottingham.ac.uk/pesl/
- Assessing Group Work The Centre for the Study of Higher Education explores some of the benefits and challenges of group work, including group formation, group processes and procedures and assessment. Web site: https://teaching.unsw.edu.au/assessing-group-work

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