

# Affective Assessment Using Social Media

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**Abstract** The industrial revolution 4.0 has changed the way humans communicate and obtain information. Social interactions occur on social media, like in the real world. A person's attitude and character can be easily assessed through these patterns of social interaction. This research is a semi-systematic review that aims to map and describe various social media-based assessment methods. Data was collected through literature surveys related to affective assessments and studies related to the use of social media in learning and assessment. Data were synthesized with a meta-aggregation synthesis technique. The purpose of this study is to provide a brief overview of the importance of affective assessment, the potential of social media in education, specifically learning and assessment, and present various alternative assessment methods that can be chosen by educators in assessing the affective domain. The results of this study indicate that three theories underlie the use of social media in education, namely sociocultural, distributed cognition, and situated cognition. The benefits that can be obtained from the use of social media in the assessment are flexible, easily repeated, convenient, and easily accessible. Four affective assessment methods can be done through social media, including self-assessment, peer assessment, language pattern analysis, and group assessment. The four assessment methods can be an alternative that can be chosen by the teacher in assessing students using social media.

**Keywords** Affective, Social Media, Assessment

## 1. Introduction

The industrial revolution 4.0 (IR 4.0) has changed the forms of communication and the way of obtaining information. Humans are connected as if without the limits of space and time. Information spreads very quickly in just seconds through chat rooms of social media users.

Sometimes this speed does not allow us to choose and trace the truth of information first. As a result, it is not uncommon for social media to turn into an arena of debate, disagreement, insults, harassment, mutilation, and slander. These attitudes can be a reflection of one's affective level, both in cyberspace and in the real world.

The use of social media for affective assessment has become quite a topic of research in recent years [1-3]. These studies seek to look for loopholes that can be taken from social media, both for learning and assessment purposes.

In practice, assessments conducted by teachers in schools are only based on the cognitive domain. This is in line with what was said by Kratwohl [4] and Rimland [5] that teachers rarely do the affective assessment, the reason being that assessment in this domain is too tricky. Studies of the affective domain are still few, often ignored, cryptic, and difficult to evaluate.

Several factors cause the affective domain to receive less attention from educators, both in the learning process and in the assessment. Most educators face difficulties in assessing affective [6]. Many educators feel that the affective domain is not a school matter, but instead the responsibility of parents at home and religious institutions in the community.

The affective domain is essential to be assessed because it is an integral part of the cognitive area. Mertler [7] said that affective assessment is critical in improving assessment results in the cognitive domain. Furthermore, Popham [8] even argues that the affective domain is far more significant compared to the cognitive area.

Although research of affective domain assessment has been carried out, for example regarding affective assessment methods and designs [6,8], affective domain learning model [9], and the influence of affective domains on mastery of material [11-13], educators have not fully realized the importance of this domain, and not have the initiative to use instruments that have been developed.

Based on the results of interviews with teachers, the obstacles they face are more on the use of affective

assessment models. Teachers find it difficult to translate existing models into assessment practices in the classroom. During this time, the data they use to conduct affective assessments is data obtained through questionnaires filled out by students. But if the information is confirmed through observations of the daily lives of students at school, a difference occurs.

Therefore, it is necessary to design an affective assessment model that is more effective and efficient and can overcome the obstacles faced by educators so far; the way is to utilize technology (ISTE, 2000). Computer-based affective assessment instruments that have been developed are still one-way, meaning that there is no reciprocal interaction between the tester and the testee. Two-way assessment allows mutual communication between the examiner and the testee can be done through social media.

Social media has been developing since 2004. Social media users are increasing every year. Wearesocial.com, which released its research in January 2019, said that social media users in Indonesia reached 150 million or 56% of the total population. The number is up 20% from the previous survey. Previously, a study conducted by Wang [13] found that almost 70% of teenagers who use social media spend 6-8 hours opening their social media accounts. In other words, the time spent by teenagers in accessing social media is more than the time they spend studying at school.

Studying in school is no longer the only way to gain knowledge. According to Zaidieh [14], there are several advantages of using social media in learning, which are flexible, easy to repeat, affordable, and fun. Rajesh & Michael [15] examined the effectiveness of using social media in their learning. The results of their research found that social media is beneficial for teachers and students in the learning process because through social media, teachers, and students can interact with each other even though outside school hours. Kalia [16] said that social media should be widely used for educational purposes, both for delivering subject matter, student presentations, discussions and questions and answers, and for assessment purposes.

The large number of internet users, especially social media, is an opportunity as well as a threat. There is a chance if it is used for positive purposes, such as building networks, businesses, sharing information, including for learning purposes. It will become a threat if its use is without direction and without control, called cyberbullying. Sharing information that cannot be justified is also often found on social media.

Given the potential that can be obtained from the use of social media in affective assessments, this research was conducted. This research is a semi-systematic review that aims to map and describe various social media-based assessment methods. This mapping is essential to obtain an overview of various alternative affective assessment

methods that can help teachers assess the affective domain more accurately. Also, researchers hope that the use of social media as an affective assessment media can be a good control for users of social media, especially among adolescents and students.

## 2. Methods

This research is a semi-systematic review which consists of the following steps:

- 2.1. Formulating the review question
- 2.2. Conducting a semi-systematic literature search
- 2.3. Screening and selecting appropriate research articles
- 2.4. Analyzing and synthesizing qualitative finding
- 2.5. Maintaining quality Control
- 2.6. Presenting findings

Data was synthesized with a meta-aggregation synthesis technique which aims to answer research questions by summarizing various research results. In the meta-aggregation the research topics are elaborated into certain themes to produce a conceptual framework. Then, in those particular themes, a search for relevant research articles is searched, compared, and summarized between one another. The synthesis results are an aggregate of various research results according to relevant themes.

## 3. Result

### 3.1. Affective Domain

Affective is a quality that shows the typical way someone expresses his feelings or express emotions [17]. Affective is the tendency of behavior to do something in a certain way, method, technique, and pattern towards the world around it. The object of attitudes that need to be assessed in the learning process is attitudes toward subject matter, attitudes towards teachers, attitudes towards the learning process, and attitudes related to values or norms related to the subject matter. Attitude starts from someone's feeling in responding to something. Attitude is also an expression of values or outlook on life held by someone. Attitude is a hidden variable that cannot be observed directly but can be concluded through behavior.

So, attitude is an internal state of a person in the form of a tendency or readiness to respond, including cognitive, affective, and conative of stimuli from the surrounding environment. What must be underlined is that the assessment of the attitude does not stand alone. Attitude assessment is integrated with knowledge assessment and skills assessment.

The affective domain has characteristics, which involves feeling that has a relatively similar pattern in various spaces and times. These characteristics contain three affective components, namely intensity, direction,

and target. Depth refers to the level of strength and weakness of emotions. Direction related to the course of feelings. There are two directions of sense, namely, positive and negative. Targets are objects, actions, or ideas that are the target of feelings [17].

According to Anderson & Krathwohl [4], when traced, almost all cognitive goals have an affective component. In learning science, for example, there is a component in scientific attitude. Scientific attitude is an affective component. There are five levels of affective domains according to Krathwohl's taxonomy, viz: receiving, responding, valuing, organization, and characterization

Thought or behavior must have two criteria to be classified as the affective domain [17]. First, behavior involves one's feelings and emotions. Second, the behavior must be typical of a person's behavior. Other criteria that are included in the affective domain are intensity, direction, and target. Intensity expresses the degree or strength of feeling.

Affective domain objects, according to Anderson & Krathwohl [4] elements, consist of interests, attitudes, values, appreciation, and adjustments. Fishbein & Ajzen [18] divide affective domains into beliefs, attitudes, desires, and behaviors. According to Hopkins and Antes [5], affective domains include emotion, interest, attitude, value, character development, and motivation. Character is also part of the affective domain. Based on the description above, it can be identified that the elements of the affective domain include at least: attention/interest, attitudes, values, appreciation, character, beliefs, feelings, behavioral emotions, desires, and adjustments.

### 3.2. Social Media

Social media is the social interaction among people where they create, share, or exchange information and ideas in a community and virtual network [19]. Social media is a group of internet-based applications that build the foundation of web 2.0 technology that enables the creation and exchange of content created by users [20]. Web 2.0 can be considered a social media platform where users can create content as their way of communicating [20].

Social media can be distinguished from other types of media (conventional media) because social media allows users to interact with others and use it to share information and build community. Social media enables users to connect by creating personal information in the profile menu, then inviting friends and colleagues to access the profile [20]. Individual profiles can include various information, such as blogs, videos, photos, and re-post content from other places.

### 3.3. Basic Theory of Using Social Media

There are at least three theories that are relevant to the

use of social media in educational practice, namely sociocultural [21], distributed cognition [22], and situated cognition [25,26]. Sociocultural Vygotsky emphasizes the critical role of the social environment in facilitating learning [25]. The social environment mainly refers to interpersonal or social interactions. This allows students to build new knowledge. The social environment influences individual learning through various tools, including cultural objects such as machines, computers, smartphones, languages, and social institutions such as schools. Among these cultural tools, language is the most powerful because language as a mediator is used directly in the process of social interaction. From this sociocultural perspective, social media applications are ideal for mediating social interactions because social media not only functions as a mediating repository of processes and products, but also helps social interactions that transcend geographical boundaries and temporal constraints.

While the sociocultural perspective emphasizes the construction of knowledge through social interaction between individuals, the perspective of distributed cognition more broadly includes interactions outside of humans. Distributed cognition confirms that knowledge is distributed through collaboration, external symbolic representations, cultural tools, the environment, and artifacts [22]. Distributed cognition contributes to broadening the view of cognitive activity that is restricted in each individual's mind to any external unit of the human mind, including others, tools, and artifacts. In terms of context, Distributed Cognition occurs in two main types of settings: original and design based [22].

An example of Distributed Cognition in a natural environment is an intellectual activity during problem-solving where Distributed Cognition exists for individuals who participate in problem-solving activities. For example, Distributed Cognition based on design, cognition is recorded on tools used by humans in interacting where the devices are made to support work, for example, calculators or software such as social media applications. Thus, the calculator contains distributed cognition during calculation tasks and social media applications (e.g., YouTube and Facebook) to record the process and product of knowledge construction.

Situated cognition focuses on the context of interaction for the construction of knowledge that complements the two views above. Situated cognition emphasizes the practice of learning in an authentic and meaningful context [25,26,29]. The contribution of this perspective in explaining the practice of using social media lies in the emphasis on learning in context (for example, activities, people, culture, and language), and learning cannot be separated from doing [23]. When individuals build mutual knowledge, they reciprocally create learning experiences with one another. Situated cognition also relates to the perspective of the community of practice where a group of people with similar interests develop and evolve together [27].

The synthesis of the three theoretical perspectives above is that knowledge gained from social media is built through social interaction [28], knowledge is seen as distributed among the entities involved [22], and learning is done by participating in communities [29]. Thus, the use of social media will engage students in building their authentic knowledge by actively interacting with others in a meaningful environment.

Social media can be a tool that has great potential to improve the learning process. Social media not only supports social and interpersonal interactions through their interactive abilities (for example, chat and comment functions), but also supports more energetic use in a variety of formats, such as text, video, and audio. Social media can be a place of distributed cognition of collaborating individuals and groups. Social media provides an environment for building authentic learning contexts where collaborators are involved in constructing knowledge through participation.

### 3.4. The Advantages of Assessment Using Social Media

Social media offers opportunities for students to connect with other students, teachers, school administrators, and all stakeholders. Researchers recognize that social media can attract, motivate, and engage students in meaningful communication, sharing content, and collaborating [30]. There are several benefits of social media for assessment, including the following.

#### 3.4.1. Flexibility

A flexible assessment gives broader choices to students on what, when, where, and how they are assessed. It also allows and supports various assessment models, including e-assessment and e-portfolio. Flexibility is one of the most exciting things about the use of social media in assessments.

While the use of social media can provide flexibility, comfort, and motivation for students to complete their assignments without being bound by space and time, chat rooms and groups on social media provide opportunities for students to exchange views, ask questions, and share understanding about the topics they studied [31]. This is in line with educational theories which assert that human interaction is an essential element in the learning process. Social media enables intense communications without space and time limits.

#### 3.4.2. Can be repeated

The ability to remember information depends on all of our sensories. Whereas, the response depends on individual character and learning motivation. Therefore, it is necessary to provide a way that allows the assessment to be repeated without being bound to time and space. This kind of repetition is rarely obtained from traditional

learning methods, but social media is able to do it. When the assessment process occurs in the classroom, especially affective assessment, it is not sure that the teacher can capture the overall behavior, attitudes, and habits of students. On social media, the teacher can observe students continuously.

#### 3.4.3. Comfort and Accessibility

Social media can make it easier for users to access, review, update, and even edit course material anytime and anywhere [31]. Also, social media allows users to choose what learning content to be assessed. Thus, social media can help facilitate the distribution of learning and assessment materials. Social media can increase satisfaction and reduce students' stress levels during tests because social media allows each student to learn at their own pace.

Seeing the potential of social media for assessment, several steps need to be taken so that the integration of social media into the assessment can be successful. Teachers, at the forefront of education, need to understand the best methods and guidelines for the use of social media in the practice of assessment. Therefore, the following will describe some of the assessment methods that can be used through social media.

### 3.5. Assessment Methods Using Social Media

Assessment and learning are interrelated [32]. What and how students learn depends significantly on how they think they will be assessed [33]. This implies that assessment is a tool for learning that can be strategically used in the learning environment to get better learning outcomes.

Through social media, students can be assessed in a variety of ways, ranging from conventional written tests to more innovative assessment modes such as self-assessment, peer assessment, joint assessment, portfolio assessment, performance appraisal, and reflective journals [34]. According to the literature, conventional assessment methods do not support students' understanding and skills gained from project-based learning [35]. As a result, researchers have proposed a new alternative valuation model consisting of a combination of valuation methods. Tal, Dori, & Lazarowitz [36] for example, present multi-dimensional assessment schemes in several ways, viz: (1) Collaborative assessment used by experts, teachers, students, and the community; (2) Use of several assessment tools: product exhibits, portfolios, peer assessments, and self-assessments; (3) The objects being assessed are students and the team.

Although the team is often the object being assessed, the proposed alternative assessment model is still focused on each student and not the project team itself. Individual assessments compared to Group Assessment do not test or

promote complex knowledge construction processes combining knowledge (e.g., content and methodological knowledge) and skills (e.g., conceptualization and problem analysis) in project-based learning.

Katzenbach & Smith [37], in their research on work groups and teams, stated that an organization strives for something higher than its members can achieve. In short, a capable team is always worth more than the individual. This is in contradiction with the writings in most of the project-based learning literature where assessment must be based on individual contributions (i.e., reduction assumptions that are not in line with the team's synergistic perspective).

The following will present some of the most commonly used project-based assessment models, viz.

### 3.5.1. Peer Assessment

Peer assessment is an assessment strategy where students evaluate the performance and achievements of their peers to enhance learning [38]. A peer assessment is carried out to assess the contribution of each student during discussions, presentations, showing their skills, and analyzing critical thinking. Peer assessment allows students to overcome problems identified by their peers through feedback. Peer assessment is not limited to transmitting and receiving peer feedback by checking ideas submitted by students in social media. The appearance of views, opinions, and thoughts on social media aims to help students compare their insights, advice, and feelings with their friends. Comments and suggestions can help students identify knowledge with poor design and cognitive restructuring processes such as simplification, clarification, and reorganization.

Peer assessment is one way to control student participation in tasks related to the group, carried out by students to assess the contribution of each member to the projects worked by the group [43,44]. Peer assessment can function to improve student learning by focusing on quality. If used without pressure, students can be encouraged to learn to evaluate and possess critical thinking skills and to gain a deeper understanding and more precise understanding of what is needed [41].

Boud [41] and William [42] report that although students are somewhat awkward to judge and criticize their friends, on average, they like this kind of grading model. Feelings of awkwardness and discomfort can be avoided by anonymous assessments so that students who are assessed need not know which students are grading. So, peer assessment using social media is quite effective in reducing pressure on students who are assessed and overcoming awkwardness on students to criticize or judge their friends.

As a facilitator, the teacher cannot always see everything that happens in one group. Giving the same value to all group members is certainly not fair for all students because there are always students who work

diligently and there are students who take advantage of the performance of their peers, this last type of student has social laziness, which means that students assume that their group members have worked well so they can be more relaxed. Therefore, peer evaluations of their own peers need to be carried out to obtain more accurate information about students' involvement in group work.

### 3.5.2. Self-Assessment

Self-assessment is defined as the process by which students monitor and evaluate the quality of their thinking and learning behavior and identify strategies to improve their understanding and skills [43]. That is, self-assessment occurs when students assess their work to improve performance because they recognize the difference between the current and desired performance. The following is a self-assessment cycle.

Self-monitoring, a skill needed for self-assessment, involves attention focused on several aspects of behavior or thought. Self-monitoring concerns awareness about the thinking and progress made by individuals at this time. Thus, students identify a part of what they do when assessing themselves.

The second component of self-assessment, self-judgment, which involves efforts to identify the progress achieved following what is targeted. Related to setting standards and criteria, this assessment will remind students of what they know and what they still need to learn. Rules are benchmarks, and criteria are guidelines for interpreting the level of performance that students have demonstrated. According to Rolheiser & Ross [44], students who are taught self-evaluation skills are more likely to endure difficult tasks, become more confident in their abilities, and take greater responsibility for their assignments.

The third important step is for students to choose goals and learning activities to correct their previous misunderstanding. Students at this stage need skills in determining learning targets and further instruction. After correcting past mistakes, students continue the self-assessment process to the initial stage, self-monitoring.

### 3.5.3. Language Pattern Analysis

The language used by someone can reflect their psychological condition. An assessment of a person's attitude and personality can be done through an analysis of the language patterns they use daily, both in face-to-face interactions and in social media. Personality assessment through language pattern analysis on social media has been successfully carried out by several researchers. Park [45] developed a method of personality assessment through language analysis on Facebook of 66,732 samples in the past six months. This research tries to connect the language used on Facebook with five components of personality.

The results of the above study indicate that the language analysis assessment method can be used to measure a person's personality. Language analysis can also be used to predict a person's mental state. If used for affective assessment in schools, this method will be beneficial with several advantages, namely: teachers can obtain large amounts of data in a relatively short amount of time, the data collected can be more valid and reliable because the data intervals taken are quite long, more objective because respondents are not aware that they are being assessed, so they do not need to manipulate language on social media.

#### 3.5.4. Group Assessment

Group assessment received less attention from researchers. Nevertheless, several studies have attempted to make it a topic [44,49]. The majority of these studies conclude that group-based project appraisal is problematic. Also, the primary assessment model that is investigated and used in practice is to assess the product/group results and then distribute this value through some form of peer assessment [47]. This is contrary to the core thinking of group work where groups have worked and appeared as one unit and need to be assessed as one unit. Thus, it is questionable whether this research relates to group assessments or individual based group evaluations.

## 4. Conclusions

The use of social media for educational purposes, both in learning and assessment, is more influenced by the sociocultural approach, distributed cognition, and situated cognition. These three approaches emphasize the importance of social interaction in influencing meaningful individual learning. Social interactions can occur offline or online.

Online social interaction is currently done more than offline interaction. This is because it is supported by the rapid development of information and communication technology. Social media, as a cultural product resulting from this progress, has put us in a new society called cyber society.

Social media, like most recent discoveries, has two sides, namely positive and negative. The positive side of social media is used for positive purposes, such as learning and assessment. However, the negative side will emerge if its use is unlimited, for example, triggering cyberbullying and hoax news dissemination. Therefore, given the potential benefits and disadvantages that exist in social media, educators should see it be used as educational support as well as a moral control of students in interacting with others on social media.

Moral control is to use social media as an affective assessment medium (attitude). The easiest thing to be the object of assessment is the pattern of interaction and the

way students communicate on social media. Through social media, educators and everyone can judge other people's personalities by the way they speak, make comments on the status of others, and respond to other people's statements. This will reflect the characteristics of an individual.

Various advantages that can be obtained from the use of social media for assessment purposes include flexibility. The nature of flexibility as inherent in social media and the internet, in general, has useful implications for the assessment process. Assessment can be done anytime, anywhere, and by anyone without being limited by barriers of space and time. Another plus is the convenience that is little obtained in conventional methods. Face to face, sometimes people are awkward to give criticism and give a negative assessment on the mistakes of others. But on social media, everyone is free to express their opinions without feeling awkward.

There are many conventional affective assessment methods that can be adapted in social media-based affective assessments. Among these are Peer assessment, self-assessment, language pattern analysis, and group assessment. These four methods can be used as an alternative assessment method in assessing the affective domain using social media. The implementation of the assessment methods is in line with the nature of the use of social media, which is flexible and provides individual comfort.

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## REFERENCES

- [1] M. De Choudhury, S. Counts, and E. Horvitz, "Social media as a measurement tool of depression in populations," *Proc. 5th Annu. ACM Web Sci. Conf. - WebSci '13*, pp. 47–56, 2013.
- [2] S. Hatzipanagos and S. Warburton, "Feedback as dialogue: Exploring the links between formative assessment and social software in distance learning," *Learn. Media Technol.*, vol. 34, no. 1, pp. 45–59, 2009.
- [3] R. W. Williams, "Digital immigrant teacher perceptions of social media as it influences the affective and cognitive development of students: A phenomenological study," *Diss. Abstr. Int. Sect. A Humanit. Soc. Sci.*, vol. 73, no. 12–A(E), p. No-Specified, 2013.
- [4] L. W. Anderson and D. R. Krathwohl, *A Taxonomy for Learning Teaching and Assessing*, Abridged. New York: Longman, 2001.
- [5] E. Rimland, "Assessing affective learning using a student response system," *Portal*, vol. 13, no. 4, pp. 385–401, 2013.
- [6] B. S. Bloom, *Taxonomy of Educational Objectives*. Canada: Longmans, 1956.
- [7] C. A. Metler, *Classroom Assessment A Practical Guide for*

*Educators*. Los Angeles: Pyrczak Publishing, 2003.

- [8] W. J. Popham, *Classroom Assessment: What Teachers Need to Know* (Second Edition), Eighth Edi. Los Angeles: Pearson, 2017.
- [9] F. Polatcan, "Attitudes of students in secondary school towards the rules of etiquette: A study on development of a scale," *Univers. J. Educ. Res.*, vol. 6, no. 8, pp. 1760–1764, 2018.
- [10] I. R. Karkada, U. John, D. Arnold, and Z. Arifin, "Relationship of Emotional Intelligence and Academic Performance among Medical Students: Systematic Review," vol. 8, no. 1, pp. 72–79, 2020.
- [11] Y. Susilowati, "The Relationship between Students, Attitudes toward Lecturer Teaching Methods and Learning Environment with Achievement Motivation (Descriptive Study of Management Students of STIE Dharma Agung)," vol. 8, pp. 65–71, 2020.
- [12] A. A. Ismail, T. Sulaiman, and S. Roslan, "Models of relationship between emotional, spiritual, physical and social intelligence, resilience and burnout among high school teachers," *Univers. J. Educ. Res.*, vol. 8, no. 1 A, pp. 1–7, 2020.
- [13] T. H. Wang, "Implementation of Web-based dynamic assessment in facilitating junior high school students to learn mathematics," *Comput. Educ.*, vol. 56, no. 4, pp. 1062–1071, 2011.
- [14] A. Jalal and Y. Zaidieh, "The Use of Social Networking in Education: Challenges and Opportunities," *World Comput. Sci. Inf. Technol. J.*, vol. 2, no. 1, pp. 2221–741, 2012.
- [15] S. Rajesh and J. Michael, "Effectiveness of Social Media in Education," *Int. J. Innov. Res. Adv. Eng.*, vol. 10, no. 2, pp. 2349–2163, 2015.
- [16] G. Kalia, "A Research Paper on Social media: An Innovative Educational Tool," *Issues Ideas Educ.*, vol. 1, no. March, pp. 43–50, 2013.
- [17] L. W. Anderson and S. F. Bourke, *Assessing Affective Characteristics in the Schools*, Second Edi. Boston: Routledge, 2000.
- [18] M. Fishbein and I. Ajzen, *Belief, attitude, intention and behaviour: An introduction to theory and research*. 1975.
- [19] T. Ahlqvist, A. Back, M. Halonen, and S. Heinonen, *Social Media Roadmaps, Exploring the future triggered by social media*. Helsinki, 2008.
- [20] A. M. Kaplan and M. Haenlein, "Users of the world, unite! The challenges and opportunities of Social Media," *Bus. Horiz.*, vol. 53, no. 1, pp. 59–68, 2010.
- [21] L. S. Vygotsky, *Mind in Society*. London: Harvard University Press, 1978.
- [22] D. H. Janassen and S. M. Land, Eds., *Theoretical Foundations of Learning Environments*, vol. 1. London: LAWRENCE ERLBAUM ASSOCIATES, PUBLISHERS, 2000.
- [23] J. S. Brown, A. Collis, and P. Duguid, "Situated cognition and the culture of learning," *Educ. Res.*, vol. 18, no. 1, pp. 32–43, 1989.
- [24] J. Lave, *Cognition In Practice: Mind, Mathematics, and Culture in Everiday*. New York: Press Syndicate of the University of Cambridge, 2003.
- [25] B. J. Zimmerman and D. H. Schunk, Eds., *Education Psychology: A Century of Contributions*. London: Lawrence Erlbaum Associates, 2003.
- [26] J. G. Greeno and Middle School Mathematics Through Applications Project Group 1, "The Situativity of Knowing, Learning, and Research," *Am. Psychol. January 1998*, vol. 53, no. 1, pp. 5–26, 1998.
- [27] J. Lave and E. Wenger, *Situated Learning*. Cambridge: Cambridge University Press, 1991.
- [28] C. Gunawardena, M. B. Hermans, D. Sanchez, C. Richmond, M. Bohley, and R. Tuttle, "A theoretical framework for building online communities of practice with social networking tools," *EMI. Educ. Media Int.*, vol. 46, no. 1, pp. 3–16, 2009.
- [29] N. B. Dohn, "Web 2.0 Inherent Tensions and evident challenges for education," *Comput. Collaborative Learn.*, vol. 4, pp. 343–363, 2009.
- [30] N. Mills, "Situating Learning through Social Networking Communities: The Development of Joint Enterprise, Mutual Engagement, and a Shared Repertoire," *CALICO Journal special issue: Second Language Acquisition Theories, Technologies, and Language Learning*, vol. 2. pp. 345–368, 2011.
- [31] C. S. Cheong, "E-learning - A provider's prospective," *Internet High. Educ.*, vol. 4, no. 3–4, pp. 337–352, 2001.
- [32] D. J. Hargreaves, "Student Learning and Assessment Are Inextricably Linked," *Eur. J. Eng. Educ.*, vol. 22, no. 4, pp. 401–409, 1997.
- [33] J. F. Ludvigsson, *Teaching for Quality Learning At University*, vol. 36, no. 4. 2003.
- [34] V. Van den Bergh, D. Mortelmans, P. Spooren, P. Van Petegem, D. Gijbels, and G. Vanthournout, "New Assessment Modes Within Project-Based Education - the Stakeholders," *Stud. Educ. Eval.*, vol. 32, no. 4, pp. 345–368, 2006.
- [35] M. Frank and A. Barzilai, "Integrating alternative assessment in a project-based learning course for pre-service science and technology teachers," *Assess. Eval. High. Educ.*, vol. 29, no. 1, pp. 41–61, 2004.
- [36] R. T. Tal, Y. J. Dori, and R. Lazarowitz, "A Project Based Alternative Assessment System," *Stud. Educ. Eval.*, vol. 26, pp. 171–191, 2000.
- [37] J. R. Katzenbach and D. K. Smith, *The discipline of teams: A mindbook-workbook for delivering small group Performance*. Canada: John Wiley & Sons, Inc., 2002.
- [38] K. J. Topping, E. F. Smith, I. Swanson, and A. Elliot, "Formative peer assessment of academic writing between postgraduate students," *Assess. Eval. High. Educ.*, vol. 25, no. 2, pp. 149–169, 2000.
- [39] R. Conway, D. Kember, A. Sivan, and M. WU, "Peer Assessment of an Individual's Contribution to a Group Project," *Assess. Eval. High. Educ.*, vol. 18, no. 1993, p. 2602938, 1993.

- [40] J. Goldfinch, "Further Developments in Peer Assessment of Group Projects," *Assess. Eval. High. Educ.*, vol. 19, no. 1, pp. 29–35, 1994.
- [41] D. Boud, "Assessment and the Promotion of Academic Values," *Stud. High. Educ.*, vol. 15, no. June 2013, pp. 101–111, 1990.
- [42] E. Williams, "Student Attitudes Towards Approaches to Learning and Assessment," *Assess. Eval. High. Educ.*, vol. 17, no. 1, pp. 45–58, 1992.
- [43] J. H. McMillan and J. Hearn, "Student Self-Assessment: The Key to Stronger Student Motivation and Higher Achievement." 2008.
- [44] C. Rolheiser and J. A. Ross, "Student Self-Evaluation: What Research Says and What Practice Shows." pp. 1–21, 2013.
- [45] G. Park *et al.*, "Supplemental Material for Automatic Personality Assessment Through Social Media Language," *J. Pers. Soc. Psychol.*, vol. 108, no. 6, pp. 934–952, 2015.
- [46] M. Lejk, M. Wyvill, and S. Farrow, "Group Learning and Group Assessment on Undergraduate Computing Courses in Higher Education in the UK: results of a survey," *Assess. Eval. High. Educ.*, vol. 22, no. 1, pp. 81–91, 1997.
- [47] M. Lejk, M. Wyvill, and S. Farrow, "A survey of methods of deriving individual grades from group assessments," *Assess. Eval. High. Educ.*, vol. 21, no. 3, pp. 267–280, 1996.