Journal of Educational Technology & Online Learning
Volume 5 | Issue 3 | 2022
http://dergipark.org.tr/jetol

Web tools as e-icebreakers in online education

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Suggested citation: Şat, M., İlhan, F. & Yükseltürk, E. (2022). Web tools as e-icebreakers in online education. *Journal of Educational Technology & Online Learning, 5*(3), 721-737.

Article Info

Keywords:

Icebreakers
Web 2.0 tools
Online education
Motivation
Engagement

Review Article

Abstract

The outbreak of Covid-19 has pushed almost all education-based institutions to migrate their available face-to-face teaching to online teaching. However, online education has posed challenges, especially for learners who are quiet and shy to speak and feeling hard to engage in the course content. At this point, turning Web 2.0 tools into icebreaker activities and incorporating them into online courses could help these students get motivated and develop active participation skills. This study took a selective and theoretical look into the literature about exploring potential Web 2.0 tools and prescribing how to use these tools as e-icebreakers in hybrid or online courses. The findings highlighted many Web 2.0 tools and described how to utilize them in online learning platforms as e-icebreakers. Suggestions about how to design Web 2.0 tool-involved e-icebreakers were provided. The study suggested important implications for instructors striving to keep learners engaged in online or hybrid courses.

1. Introduction

There are different forms of education available to transfer knowledge and skills to learners. Online and face-to-face teaching are two most commonly applied forms in worldwide. Compared to face-to-face teaching, distance education helps students learn at a distance without being influenced by distance-related factors. After the outbreak of Covid-19, educational institutions have started to migrate their face-to-face courses to the online environment (Henriksen et al., 2020). However, this transition introduces many new challenges, mostly about delivering the course content and satisfying learners' conditions and well-being (Colvin et al., 2022; Güneş & Toran, 2022). It is widely accepted that students' persistence in online learning environments depends mainly on their satisfaction and commitment to the online course (Gopal et al., 2021). It is suggested that arousing a solid sense of community could result in better learning outcomes and increase student retention rates in online classes (Rovai, 2002). That is why a sense of community has become a fundamental theoretical concept when it comes to online learning.

There is no universally agreed definition of what a sense of community means. Yet, Rovai (2002) provided a cumulative description and categorized the vital elements of a sense of community as "mutual interdependence among members, connectedness, trust, interactivity, and shared values and goals" (p. 321). According to McMillan and Chavis (1986), a classroom community is a group of individuals motivated by a feeling of belonging and built based on the belief that being part of the group brings about learning and social support. In the context of distance education, a sense of classroom community refers to an online

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Doi: http://doi.org/10.31681/jetol.1084512
Received 9 Mar 2022; Revised 17 Sep 2022; Accepted 27 Sep 2022
ISSN: 2618-6586.

learning environment where groups of learners depend on each other, share mutual goals and values, build a sense of trust and interaction, and feel belonging to the group community (Preece, 2000; Rovai, 2001).

For online education, a sense of community is associated with a social community of learners who are expected to share common knowledge, values, and goals. A prominent study showed that online students with a stronger sense of community were inclined to feel less isolated and to show greater pleasure in the online learning program, and therefore less likely to drop the course (Rovai, 2002). It is known that effective instructional strategies make it possible to promote a sense of classroom community among online students. For instance, a previous study reported that a successfully designed learning environment promoted a sense of classroom community (Rovai, 2001). The researcher attributed this growing sense of classroom community to the interaction and involvement of learners in the course. Therefore, online students' engagement and participation in class and class-related tasks are crucial to their success and motivation (Shackelford & Maxwell, 2012).

It is stressed that knowledge tends to be constructed when learners engage in a successful interaction on online learning platforms (Souabi et al., 2021). This type of interaction is called the 'social learning approach.' Social learning is considered a vital element in online education due to its beneficial effect on learning. It is a group process shaped profoundly by trust and social capital, formed by learners, and tends to boost conservation outcomes (Tam et al., 2021).

The design of an online learning platform is expected to support and promote a collaborative social learning community in which students engage in meaningful interaction and discussion with peers and teachers and, in turn, extend their knowledge (Gan et al., 2015). Therefore, online learning environments function as social platforms or online communities using various tools that drive social interactions and facilitate the exchange of knowledge and experiences between users (Dixon et al., 2006).

After a sudden and substantial shift to the online classroom, engagement has become a widespread concern for instructors who have to deliver their courses online (Chierichetti & Backer, 2021). It is stressed that web technologies could provide valuable alternatives and create new productive possibilities to remove the barriers to online classes (Tunks, 2012). Web 2.0 tools are a class of web-based technologies that enrich collaboration and interaction in various ways. In other words, Web 2.0 is a term coined to encompass multiple technologies with critical features that aim to facilitate communication and knowledge transfer (Anderson, 2007; Rollett et al., 2007). A combination of these tools could be used as part of different activities, like icebreaker activities, to strengthen students' connections to the online courses and get used to the course dynamics.

During the COVID-19 pandemic, online teaching has become a safe and viable option for all students worldwide. This is not a novel method for educational institutions; indeed, the number of online courses and students learning online has increased steadily over the last decades. However, because there are no other options for learning due to the pandemic, creating an effective online learning environment is more critical than ever (Zhou et al., 2020). It has become a well-known and widely accepted notion that learning is less likely to occur without improved instructional design and interaction for all students (Sweller et al., 1998). In traditional education, instructors can predict the interest and motivation of students, most probably, from their gestures and body movement (Coskun & Cagiltay, 2021). However, in online education, it is impossible to observe all students' activities simultaneously, capture their reactions instantly, decode what they are trying to do, and follow them throughout the course. Thus, there is a need to develop various tools and techniques specifically tailored to increase students' satisfaction and motivation to learn, improve their performance, and decrease their perceived sense of isolation in online education.

Several well-known learning theorists, including Bruner (Bruner, 1964), Vygotsky (Vygotsky, 1987), and Piaget (Piaget, 2008), have stated that individuals' learning does not occur in a void independently but rather through interaction. In addition, constructivism, one of the most current learning theories, views

interaction as essential to learning and teaching (R.-Marie. Conrad & Donaldson, 2011). That means interaction is critical for high-quality instruction and effective learning outcomes. Accordingly, students' interaction with teachers and peers in online learning environments is paramount to effective learning (Dixon et al., 2006; Martin & Bolliger, 2018).

In recent years, we have gained more knowledge about online education, but additional suggestions and guidelines are needed to help instructors design interaction-focused activities. At this point, e-icebreakers, one of the popular activities, take to the stage as they are increasingly recognized as creating and enhancing a supportive and friendly atmosphere in educational environments. They are generally interactive methods that change students' false prejudices, expand communication boundaries, and motivate them in the classroom (Chlup & Collins, 2010; Martin & Bolliger, 2018; McGrath et al., 2014). The newly developed cutting-edge technologies could help preparing icebreaker activities in web-based learning environments; in short e-icebreakers. Thus, this study reviews the literature on the use of e-icebreakers in online education to address the following research questions (RQ):

RQ1. What are the characteristics of studies using e-icebreakers for online or hybrid teaching?

RQ2. What are the affordances of e-icebreakers in online or hybrid teaching?

RQ3. What are the types of e-icebreaker tools used in online or hybrid teaching?

RQ4. What are the suggestions for designing e-icebreakers for online or hybrid teaching?

2. Method

A systematic literature review was undertaken to comprehensively overview prior research regarding e-icebreaker techniques in online/hybrid teaching. One of the essential factors in review studies is to set a boundary in the sources of scientific information and the databases hosting and indexing these sources. In review studies, researchers' methods to select a defined set of digital sources are differentiated. While some studies stick to the Social Sciences Citation Index (SSCI) indexed journals only (Atman Uslu et al., 2022), others expanded their horizon and inspected more than one database to cover a more comprehensive library (Feser & Haak, 2022). In this current study, we carried out a systematic search in major research platforms (Education Resources Information Center (ERIC), ProQuest, and Web of Science (WOS)) to access a broad range of primary and secondary resources, including books, conference proceedings, research articles, and other informative documents. The search terms we used to identify resources relevant to the research topic included "icebreaker", "online education," "hybrid education," "hybrid teaching," "online teaching," "hybrid learning," and "online learning. Since some search terms were used interchangeably, we used Boolean operators "OR" and "AND" to combine them. The search string used is as follows.

- ("icebreaker" OR "ice-breaker" OR "ice breaker") AND ("online education" OR "hybrid education" OR "hybrid teaching" OR "online teaching" OR "hybrid learning" OR "online learning")

While performing the search in all databases, no restriction was imposed on time. Accordingly, the sources dating from 1980 to the present were considered. As for the search filtering, we selected categories that corresponded to education or contained the word either education or sciences. Additionally, the sources with no electronic format were excluded from the analysis. Two researchers undertook the search and determined whether the sources attained were suitable and worth examining in detail. Using the search string above in three databases led to the retrieval of a few articles.

We also added Google Scholar to our search databases to find potential sources and broaden search results. In the initial phase, the sources identified were manually screened. To select potential sources, the researchers first checked the title of the sources and then their abstracts to ensure that the chosen sources were eligible and relevant. An extensive and long-lasted examination resulted in a pool of 117 sources. In

the second phase, the gathered sources were thoroughly inspected, and the irrelevant sources were eliminated. Finally, the researchers decided to keep 60 studies for review.

2.1. The analysis processes

Two researchers independently analyzed and coded the studies using MAXQDA software. During the analysis, the researchers adhered to the analysis steps suggested in the literature (Tesch, 1990). In other words, each study was not examined in terms of pre-developed elements. Instead, the researchers coded each piece of data they found meaningful and relevant. However, the main focus was on the particular study content that contained valuable information to answer the research questions. In short, the researchers primarily looked at the characteristics of e-icebreaker activities, the type of technologies used to deliver e-icebreakers, the reported benefits associated with e-icebreakers, and the suggestions about how to prepare and use e-icebreakers.

3. Results

3.1. The characteristics of studies using e-icebreakers for online or hybrid teaching

The review result showed that of the 66 studies, 44 applied and implemented e-icebreaker activities in their research. The distribution of these studies for the year published was illustrated in figure 1 below. As seen in the figure, the number of studies about e-icebreakers increased over the years and peaked in 2021. The rising trending line in years could be due to the increasing use of technologies in delivering educational content in online or hybrid form. Most of these studies were articles (*N*=32), followed by proceedings (*N*=8), and lastly theses (*N*=4).

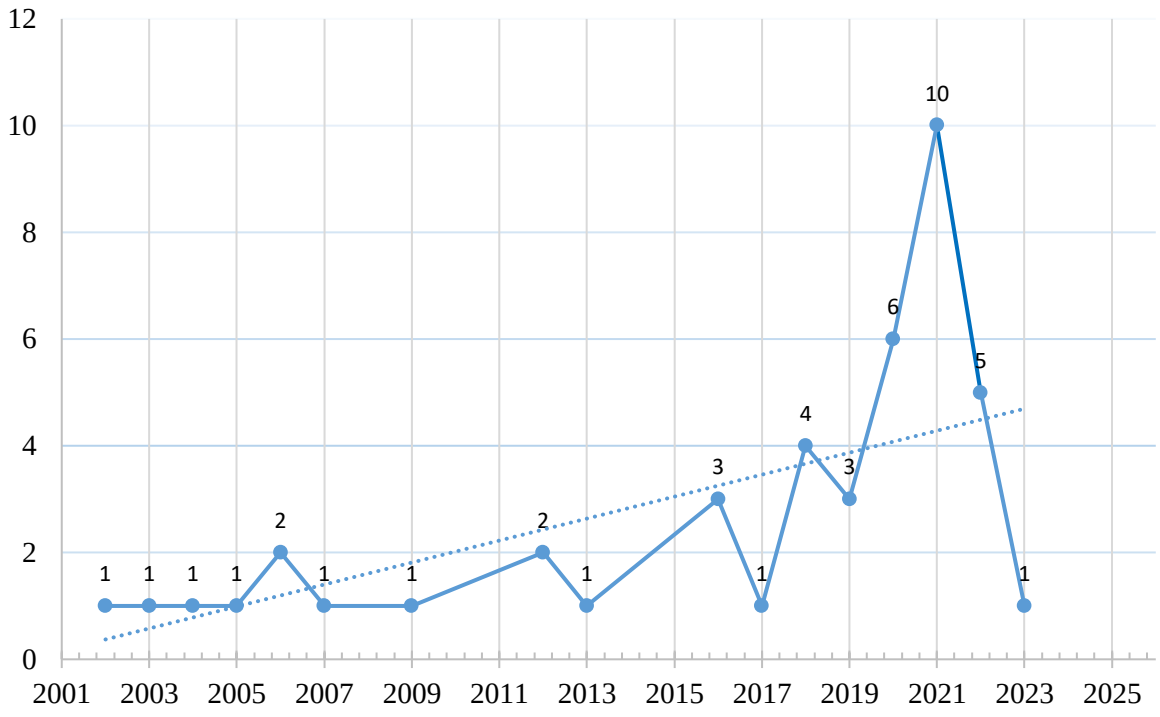

Fig. 1. The distribution of studies in terms of the year of publication.

The study showed that most of the studies were secretive about the type of e-icebreaker activity used and the process they followed to apply it. More specifically, most of the authors just mentioned that they used e-icebreaker to help students get to know each other or create a discussion board where students posted something particular or interesting about themselves and made comments on their posts (Abou-Khalil et

al., 2021; Bell & MacDougall, 2013; Bury et al., 2006; Caruana & Camilleri, 2019; D. Conrad, 2002; Delmas, 2017; Hench, 2012; Leslie, 2020; O'Dea, 2021; Reushle & Mitchell, 2009; Rolé, 2020; Ruing & Mardiani, 2021; Walcott-Bedeau, 2022; Wang et al., 2003). However, there was no further information regarding how these studies conducted e-icebreakers and which web tool they used to deliver it in the course.

3.2. The affordances of e-icebreakers in online/hybrid teaching

Icebreakers are activities prepared to help students and instructors become acquainted and form a learning community where students can feel free and comfortable participating in an event (McGrath et al., 2014). Clark (2015) stated that the name "icebreaker" derived from the phrase "break the ice," which refers to special ships known as "icebreakers" that are used to break up ice in the arctic. He further explained that just as icebreaker ships made traveling simpler for other ships, an icebreaker helped clear the ways that led to learning by encouraging the learners to converse more comfortably. For years, icebreakers have been utilized in face-to-face conventional learning environments to assist individuals in getting to know one another and generate a friendly group mood. They are also helpful for online students who do not have access to face-to-face interaction. In online learning, e-icebreaker activities could further develop a sense of community, enhance engagement, and support collaborative work (Dixon et al., 2006; Martin & Bolliger, 2018).

The coronavirus outbreak (COVID-19) has driven many institutions to shift face-to-face teaching to online teaching. However, online course content might require motivational activities to keep students motivated and occupied with the course materials. Many available tools could be suitable candidates for an e-icebreaker activity in online courses. In a study, the researcher shared out grids as e-icebreakers to amplify science identity, class community, and classroom structure (Kirby, 2020). In the activity, students were asked to write their favorite fictional scientist on the card and share it openly so that all students could see it. It is important to note that the questions did not require prerequisite knowledge like course content information. The researcher remarked that involving students with these questions and soliciting answers from them could flourish classroom identity, keep students adjacent to science, and help open areas for shy, nonverbal, disabled, and neurodiverse voices. It was also reported that students immensely enjoyed the e-icebreaker activity.

Students' interaction with web technologies has become much more intense as COVID-19 rapidly spreads to different countries. For instance, Ma et al. (2016) suggested an e-icebreaker design called Breakage-to-Icebreaker, which is an approach to breaking down barriers between humans and technology that can lead to positive behavioral, emotional, and relational change. Ma et al. (2016) presented a set of tactics to leverage antifragility without impairing users' relationship with technology. They highlighted that the integrated e-icebreaker approach could help facilitate the factors that inhibited interaction in online teachings, such as physical isolation, social isolation, technological isolation, social awkwardness, social inappropriateness, and emotional indifference (Ma et al., 2016).

In literature, e-icebreakers have been implemented in various activity forms, emphasizing different dimensions of online learning. For example, it has been reported that e-icebreakers can help students deal with many situations caused by transactional distance. Dixon et al. (2006) examined the effect of e-icebreakers on the development of undergraduate students' social presence in online learning environments. It was reported that students put a positive and significant value on e-icebreakers and regarded them as provoking activities to create a welcoming online climate and build a community where learners could sustain collaborative work. Moreover, in a more recent study, Baker et al. (2020) used e-icebreakers as an instructional strategy to establish the engagement of extroverted students in an upper-level experimental physical chemistry course. The finding regarding the use of e-icebreakers showed that the presence of e-icebreakers kept students psychologically safe and felt unintimated to answer the questions, regardless of whether the answer was correct or wrong.

Many human-related conditions are attributed to online teaching and learning. Boredom is one of the highly-emphasized conditions in previous online education studies. In a recent research, Pratama et al. (2021) investigated the effect of an e-icebreaker on online students' learning motivation. In the study, a game-based learning method was employed to relieve students' boredom and, in turn, increase their motivation for learning. The study result showed that the e-icebreaking learning model increased students' learning motivation. In addition, another previous study examined the effects of Web 2.0 tools on cross-cultural communication (Lee & Markey, 2014). Twitter was one of the study's tools that served as e-icebreakers. The researchers reported that students' tweets regarding their biographies, hobbies, and schoolwork let them build personal relationships with their cross-cultural partners. In addition, in their study on the role of Web 2.0 tools in foreign language learning, Baytekin and Su-Bergil (2021) concluded that using Web 2.0 tools as e-icebreakers could increase students' motivation for learning. Other researchers share the same proposition. For instance, Üstünbaş and İpek (2021) stated that Web 2.0 tools as e-icebreakers in mobile-assisted language could motivate and engage students in language learning.

In general, a course is composed of tasks sequenced in order. Icebreaker activity inherently takes first place in the task sequence. Ferreira-Lopes et al. (2021) examined a series of tasks in a project. e-Icebreaker activity was the first task in the project. Each student in the activity was required to create a two-minute video describing their qualifications and course expectations before sharing it with other students. It was reported that e-icebreakers helped to increase students' intercultural relationships. Using a different study method, Miller and Mandryk (2021) investigated the relative impact of synchronous media sharing and e-icebreaker questions on interactions in Video Chat. They found media sharing superior in supporting interaction at the early stage of video chatting.

Research highlights that e-icebreaker activities bear a high potential to bring many contributions to online and hybrid teaching. Evidence-based research studies conducted in online and hybrid modes showed that use of e-icebreakers activities promoted the development of online identity (Augar et al., 2005), brough about positive effect on engagement and learning goals (Avsheniuk et al., 2021; Baker et al., 2020), student-student engagement (Abou-Khalil et al., 2021; Bolliger & Martin, 2018), effective collaborative activities (Dixon et al., 2006), and English Language Teaching (ELT) learners' speaking ability (Yeganehour, 2016; Yeganehpour & Takkaç, 2016), increased social presence and course engagement (Carpenter & Roberts, 2007; Carson, 2014; Martin & Bolliger, 2018), student-instructor interactivity (Hench, 2012; Lam et al., 2021), students' enthusiasm for learning English (Sonia et al., 2021), and ELT students' motivation in learning English (Agusriana, 2021; Burhan, 2017), augmented online learning community (Carson, 2014; Caruana & Camilleri, 2019) and a sense of community (Caskurlu et al., 2021; Dixon et al., 2006; Labbé & O'Brien, 2021; Lam et al., 2021), and made learning fun (Damara, 2016). Despite the reported benefits associated with e-icebreakers, a recent study indicated that the use of e-icebreaker videos failed to capture students' interest and enjoyment (Val, 2022).

3.3. The suggestions of designing e-icebreakers for online/hybrid teaching

There are multiple purposes for preparing icebreakers in educational environments. For instance, they are fun and interactive activities that help students and teachers be acquainted. However, there are many issues to consider while preparing e-icebreakers for online courses. In their study on e-icebreakers, Yılmaz and Özkaynak (2012) pinpointed some crucial design points for those interested in preparing e-icebreaker activities for their online courses. First, students should not have to own specific expertise or unique knowledge to involve in the task associated with an e-icebreaker activity. In other words, their existing knowledge or skills should be sufficient and allow them to participate in e-icebreakers easily. Second, a teacher should be careful and attentive when designing and preparing an e-icebreaker exercise since a badly planned e-icebreaker activity might decrease rather than raise student motivation. Third, an e-icebreaker activity should never be tedious. Students should use the e-icebreaker activity with their own goals instead of trying to finish it reluctantly, even if they are unaware of it. Forth, an e-icebreaker activity should incorporate communication elements.

Effective e-icebreakers are essential for students and instructors in educational environments to create a welcoming atmosphere and helpful climate and establish better communication. McGrath et al. (2014) proposed some beneficial tips on designing effective e-icebreakers for online or hybrid courses. These suggestions were provided and further developed as follows:

- An e-icebreaker activity should be simple, straightforward, and easy to follow so that every student can understand it without unique prior knowledge.
- An e-icebreaker activity should be creative and intriguing to capture students' attention and push them to participate in the course content.
- An e-icebreaker activity should drive learners to do brief reasoning and help forge a link to prior knowledge.
- An e-icebreaker activity should make learning fun and appealing and evade turning it into a routine chore.
- An e-icebreaker activity should be designed, considering the available skills owned by both instructors and students.
- An e-icebreaker activity should be prepared, considering the constraints/requirements of the used technologies.

All kinds of online communication tools, from e-mails, questionnaires, discussion forums, and chat rooms to video conferencing, could be used to deploy e-icebreakers in online education. In other words, e-icebreakers could be implemented through both asynchronous and synchronous media platforms (Zenios, 2009). Thus, several Web 2.0 tools could be life-savers to prepare and effectively use e-icebreaker activities on online platforms. These tools are well-known for allowing the creation of participatory web pages where students and instructors quickly add to and edit the content on the Web. Therefore, they can effectively connect students and resources, facilitate interaction, foster collaboration, and boost active participation. According to Chlup and Collins (2010), Web 2.0 tools could be beneficial environments for putting e-icebreaker activities into action. They suggested utilizing several e-icebreakers strategies as follows:

- Asking students to write a post including their favorite quote
- Asking students to write a post representing their past, present & future
- Share a theme song representing the life of the students
- Describe a characteristic unique to one of the sexes
- Respond to other students' posts that resonate with them

Many authors suggested that e-icebreakers should have been performed at the beginning of an online course (Green et al., 2015; Leong, 2011). They also added that using such a method could support meaningful engagement, dynamic interactions, and community building (Cong, 2020), build on connections and trust (McGrath et al., 2014; Schweiker & Levonis, 2020), and develop a greater sense of community (Schweiker & Levonis, 2020). Some suggested e-icebreakers included bingo, classmate quiz, lineup, lost in space, give a name that movie, one word, portrait, room with a view, snowball, things, truths, and lies, what kind of animal?, and why are we together? (Conrad & Donaldson, 2004).

3.4. The types of e-icebreaker tools used in online/hybrid teaching

The study result revealed that researchers used several web tools to deliver or perform e-icebreaker activities. Those tools ranged from webcam video (Borup & Evmenova, 2019) to WebCT (Bury et al., 2006), wiki (Augar et al., 2004, 2005; Carpenter & Roberts, 2007), Moodle (VLE) (Caruana & Camilleri, 2019), Kahoot (Damara, 2016), videoconference (Bell & MacDougall, 2013), and VoiceThread (Delmas,

2017; Martin et al., 2023). As for the type of e-icebreakers, it was revealed that studies broadly utilized question forms. The purpose of these questions was to allow students to introduce themselves and write comments on each other's posts.

Web 2.0 tools appear to hold tremendous potential as e-icebreakers in online courses to help instructors make learning interactive and collaborative and create social environments. Many Web 2.0 tools with distinctive properties can be adopted or adapted to the online learning environment and be used as an e-icebreaker activity. The following table presented a list of Web. 2.0 tools that could be utilized when designing e-icebreakers for online education. Some of them were mainly selected to highlight the diversity of e-icebreaker activities.

Based on the literature review and the authors' personal teaching experiences, the tools in Table 1 were selected to offer an example of Web 2.0 tools that were free of charge and easy to use. These tools provide us with a world of options for developing e-icebreaker activities. Apart from using available e-icebreaker activities, there are also options for individuals to create and develop new ones by leveraging Web 2.0 tools. For instance, instructors may begin to build a dialogue for learners to make introductions in online classes. They may request a list of students' interests or ask for their particular interests, such as hobbies, preferred places to travel, or vacation. Students may prepare their blogs in response to a teacher's request. In addition, students can construct a collage of five images that best define themselves. They could create these visual materials using Canva. Students might also make a Kahoot activity by telling truths and lies about themselves. Classmates may try to predict whether a piece of information is true or false. Classdojo could be used to create a unique and social space for students. On this platform, students could post questions and comments on personal interests, exciting items in the news, etc. Teachers can ask for students to write an exciting or relevant paragraph and then put it through Tag Crowd to generate a text cloud.

Students can share their text cloud on the course forum, which might motivate them to participate in the course actively. This free application has broad applicability to online classes in distinct fields. Twitter is known to be one of the most frequently used social media platforms among students. A shred of scientific evidence proves that Twitter can provide a fertile ground for student engagement in online courses (Junco et al., 2011). The Twitter hashtag appears to hold an excellent opportunity for e-icebreaker activities. Teachers can ask students to share their posts under a specific hashtag, or other hashtags students prefer to use. Besides, these posts could be about anything in any format, such as graphics, animation, text, audio, and video.

Table 1.

The Web 2.0 Tools for e-Icebreaker Activities

Name	Brief Description	Capabilities for e-icebreaker
Blogger	It is a digital content creation tool.	Students can create content, articles, reviews, websites, portfolios, and diaries for other students to read on different topics.
Popplet	It is an online tool that allows users to create mind mapping and brainstorming diagrams.	Students might respond to an educator's inquiry by exploring their interests and interacting with other students who share those interests.
Kahoot	It is a gamification-based tool.	Instructors can make individual or group evaluation activities enjoyable, especially at the beginning or end of the class.
Canva	It is an online design tool.	Students can design visual materials such as logos, banners, presentations, brochures, and posters with many different templates.
Edpuzzle	It is an online tool for making videos interactive.	Students can create interactive videos on YouTube or similar platforms by adding open-ended and multiple-choice questions.
Kapwing	It is an online collaborative video production tool.	Students can easily create videos by adding images, videos, and sounds. They can do their video creation and editing activities using this tool.
Menti	It is an online tool for assessment and evaluation.	Instructors can get opinions from students by preparing short questions, word clouds, and open-ended questions with this tool.
Classdojo	It is a gamification-based virtual classroom tool.	Instructors, students, and parents come together on an online platform where positive and negative instant feedback can be given.
Tag Crowd	TagCrowd is a web application for visualizing word frequencies in any text by creating a word cloud.	This tool allows instructors to ask learners to generate their word cloud based on a piece of text, a web address, or an uploaded file and share it with peers.
Twitter	Twitter is a networking site allowing users to interact through "tweets."	This social networking tool can be integrated into online education platforms where students can share their posts under the designated hashtag.
VoiceThread	It is an online tool students can utilize to create presentations using multimedia content like images, documents, videos, and other media. The presentations created allow comments from other users for discussion.	Using this tool, students can create a short video about anything that strengthens their presence in the course. For instance, this could be a video allowing them to get to know each other or the instructor.
WebCT	It is a collection of Web-based course development tools with many capabilities, such as discussion forums, chat rooms, and online quizzes.	Instructors can exploit the capabilities of WebCT to perform different e-icebreaker activities. For instance, online discussion groups and chats could help students get to know each other and the instructor.

In addition to Web 2.0 tools described in the table, literature introduces some other web tools used as e-icebreakers to engage students with disadvantages in the online learning process, alleviate the feeling of isolation due to learning online, and build an engaging online community (Holbert, 2015; McGrath et al., 2014; Styani et al., 2017). The tools described in these studies are also a great example of integrating web technologies into online courses.

As a result, many Web 2.0 tools could be turned into e-icebreakers to drive and motivate the participation of the students, especially those experiencing difficulty in involving in the course or course-related events. In this respect, the e-icebreakers mentioned above and the other types could establish a positive social climate for online courses.

4. Discussion and Conclusion

This study addressed Web 2.0 technologies that could be utilized as e-icebreaker activities in an online learning environment to overcome the sense of isolation associated with online learning and establish a

more successful learning community. In other words, these tools allow students to share ideas, feelings, requests, and learning outcomes with their peers. At this moment, they could be helpful and effective methods for being part of learning and engaging in group activities (McGrath et al., 2014). These e-icebreaker tools could help motivate students to participate in learning activities and strengthen collaboration between their peers. Therefore, incorporating these activities into native teaching methodologies enables the achievement of more effective learning objectives (Zenios, 2009).

Face-to-face icebreakers and e-icebreakers, or a combination of both, can enhance communication and collaboration levels in educational environments. It is crucial to implement an effective, a successful, and an efficient learning. With the help of Web 2.0 tools, e-icebreakers seem more attractive, less time-consuming, more functional, more preferable, and easier for students and instructors. As a result, e-icebreakers appear to be essential in learning activities for achieving the learning aims at the beginning or during the whole learning process.

In online or hybrid format-based education, students may attend the online learning space with some preconceived notions that spending time on the screen alone will be boring and uncomfortable. Presenting e-icebreaker activities at the beginning of the course can instill positive thoughts into students and relieve such unpleasant notions and attitudes about learning on online platforms. Furthermore, when its capabilities are combined with Web 2.0 tools, e-icebreakers stand out as promising tools for student engagement and a student-centered strategy to personalize the online course space and help students strengthen their online presence. There is a well-established link between learning gain and online presence. A body of evidence suggest that online presence significantly affect learning performance in online courses (Yang et al., 2016).

An e-icebreaker activity can incorporate one or a combination of more than one Web 2.0 tool. This largely depends on the purpose of its usage and whether it can be integrated into online or hybrid-based platforms. Icebreakers are generally conceived as fun activities targeting students' low confidence and boosting them to engage in course-related tasks successfully. One of the well-known traditional use of icebreakers in face-to-face (F2F) teaching mode is to make students get to know each other, feel comfortable, and communicate freely without feeling intimidated. The same uses hold true for online learning environments. Web 2.0 tools are compelling technologies that can turn traditional icebreakers into dynamic and interactive online learning communities in which students feel free to speak, share their thoughts and ideas, and learn from each other. As a widespread tool, Twitter could be used as an e-icebreaker to trigger "getting-to-know-you" dynamics and encourage students to get acquainted (Lee & Markey, 2014).

The sudden shift to distance teaching and learning worldwide due to the COVID-19 pandemic has created a need for involving Web 2.0 technologies in the teaching and learning process. A recent study showed that these tools have a high potential to alleviate a sense of isolation caused by pandemics and increase student interaction (Zhang, 2022). Therefore, integrating Web 2.0 tools into e-icebreaker activities could be beneficial in many aspects, especially for students who have difficulties in speaking and communicating in online courses.

Today's emerging technologies (e.g., blogs, wikis, content creation tools, mobile technologies, virtual worlds) all stand as potential candidates for conducting e-icebreakers. Online e-icebreakers incorporate many techniques, and researchers have benefitted from various technologies to deliver such warm-up activities to create a learning environment where students actively and eagerly pursue learning. However, instructors have to be cautious about selecting and framing an e-icebreaker activity and the web tool used to perform it (R.-M. Conrad & Donaldson, 2004; Landay, 2011). Study findings pinpointed that e-icebreaker activities predominantly accomplish two main goals in online/hybrid teaching: encouraging interaction and helping students become acquainted with other students and the instructor. However, these goals appear to support social presence and student learning. Therefore, e-icebreaker activities and Web 2.0 tools used to perform them could be considered within the perspective of social presence.

The accomplishment of e-icebreakers largely depends on strategies and methods that instructors follow to design an e-icebreaker activity. Therefore, instructor involvement is critical and significant for e-icebreakers. Instructor involvement is introduced as one of the main components of the social presence model (Short et al., 1976). Similarly, icebreaker activities are considered important elements in shaping social presence (Peechapol et al., 2018). It is vital to establish a social presence in online/hybrid teaching since social presence influences students' satisfaction, engagement, and learning (Wise et al., 2004). Consequently, e-icebreaker activities are important elements that instructors can use to increase their involvement and establish a social presence in online courses (Garrett Dikkers et al., 2013).

Most of the research studies reviewed reported that they used e-icebreaker activities in the study. Still, they refrained from giving a detailed account of e-icebreakers they used and the way they implemented them. For that reason, the information provided about e-icebreakers remained partly limited, which was considered as one of the limitations of the current study.

Students who enter an online or hybrid world for the first time are likely to be afraid to break out of their comfort zone and be shy or speak in front of the camera or other students. In addition, they may not be interested in the course content and reluctant to participate and share their thoughts. Getting to know each other could be an exciting e-icebreaker activity to let students and instructors know one another. Yet, e-icebreaker activities that are not carefully framed or designed could discourage students from participating in the course. Although e-icebreakers are considered valuable activities for both teachers and students in both online and hybrid education, there seems to be no established foundation or elements on which these activities are built (Chen, 2012). Therefore, the following e-icebreaker design tips were suggested based on the studies reviewed. We believe that these tips could help instructors how to design and leverage e-icebreaker activities most effectively and efficiently.

4.1. e-Icebreakers design tips to enhance online course engagement

- An icebreaker activity should be simple, straightforward, and easy to follow.
- An icebreaker activity should be designed so that each learner becomes completely comfortable when involved.
- A sufficient amount of time should be set for an e-icebreaker activity.
- Size of the groups should be considered when designing e-icebreakers.
- An e-icebreaker activity should arouse learners' interest and curiosity.
- An e-icebreaker activity should be designed around something interesting that brings everyone together into the activity.
- If required, instructors should use e-icebreakers more than once throughout the course.
- The language used in an e-icebreaker activity should connect learners rather than polarize them.
- Instructors should be educated about designing an effective and fruitful e-icebreaker activity.
- Instructors should consider learners' skills and characteristics while creating a blueprint for designing an e-icebreaker activity.
- Learners should not require a piece of special equipment, additional knowledge, or skill to participate in an e-icebreaker activity.
- The purpose intended to be achieved through e-icebreaker activities must not be ambiguous but clear.

- While planning an e-icebreaker activity, it is crucial to consider the constraints upon the technologies and software used to deliver course content to learners.
- The web technologies chosen to serve e-icebreakers should be suitable and convenient to fulfill the activity objectives.
- The Web 2.0 tools selected for an e-icebreaker activity should be easy to use and implement.
- The Web 2.0 tools should be compatible with and easily integrated into the online course platform.
- For an e-icebreaker activity, it is better to choose Web 2.0 tools with the potential capabilities of letting learners have thrilling and fun experiences.
- When selecting Web 2.0 tools for an e-icebreaker activity, the instructor should consider its pros and cons in terms of its usage.
- Instructors should prefer using Web 2.0 tools that motivate learners to talk to each other and work collaboratively.
- It could be better to select web 2.0 tools that allow sharing, liking, and commenting.

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