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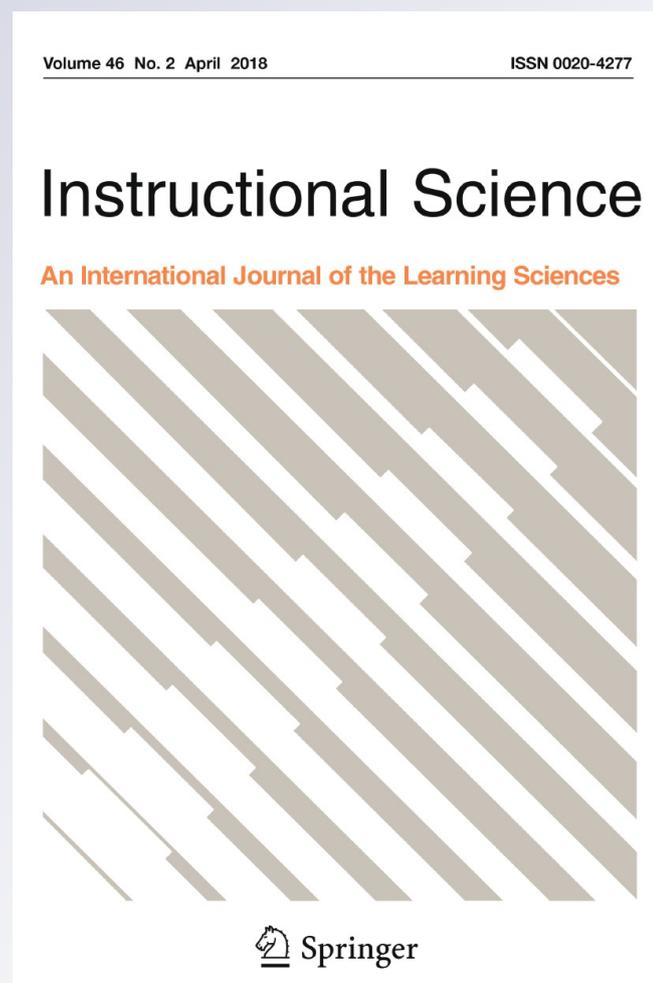
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Digital technologies for promoting “student voice” and co-creating learning experience in an academic course

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Abstract “Student voice” (SV) refers to listening to and valuing students’ views regarding their learning experiences, as well as treating them as equal partners in the evaluation process. This is expected, in turn, to empower students to take a more active role in shaping their learning. This study explores the role played by digital technologies in creating a space for SV in academia. The qualitative study was conducted in an academic course, which combines face-to face, synchronous lessons with a variety of asynchronous self-directed and group learning activities. The participants were 54 Master’s students in education. We analyzed the pedagogical design of the course, as well as interpretations of teaching, learning, assessment, and the role of technology as experienced and presented by the students. The findings demonstrated that students functioned as co-designers of the course content, co-creators of teaching and of their own learning experience. Students perceived the requirements of active learning, teamwork, and community participation (i.e., an advanced way of conveying SV—*leadership*; Mitra International handbook of student experience in elementary and secondary school, Springer Publishers, The Netherlands, 2007), as both challenges related to overload and stress, and benefits related to the gains of meaningful learning, innovative pedagogical design, and diverse instructional methods. The equalization effect of the digital environment, which diminishes status cues changed the power dynamic, promoted students’ active participation and their pedagogical partnership with the instructor. Based on the findings, our conceptualization of SV and its implications for academia includes: (1) co-design of content, (2) co-teaching, (3) co-creation of learning experience and outcomes, and (4) embedded co-assessment *for* learning.

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Keywords Student voice in higher education · Student voice as listening, collaboration and leadership · Teamwork and learning community · Students as co-designers of content, teaching, learning and assessment · Added value of technology and embedded assessment · Online equalization effect · Active participation and engagement

Introduction

A concern regarding the dominant educational culture is that it “prevents practitioners from listening to students’ own creative ideas about how systems can change and meet their needs” (Cruddas and Haddock 2003, p. 6). However, there is a rapidly growing research literature on “student voice” activities, which promote a transformative change in educational practices (Seale et al. 2015). **In school settings**, the “student voice” (SV) approach is well defined and includes several aspects: listening to and valuing the views that pupils express regarding their learning experiences; communicating pupils’ views to decision-makers; treating pupils as equal partners in the evaluation of teaching and learning processes; and empowering pupils to take a more active role in shaping or changing their learning (Faux et al. 2006; Walker and Logan 2008). Mitra’s (2007) framework delineates three different forms of SV work in schools. The term “*listening*” describes educators or evaluators who use students’ raw perspectives for either research or educational reforms. The term “*collaboration*” emphasizes a “focus on research” in which students and teachers work together to co-explore needs and/or to co-develop changes in the learning process. Finally, the term “*leadership*” highlights a “focus on change” within which students are in charge of learning activities and, with teachers’ guidance, make most of the educational decisions. Hence, according to Mitra’s approach, “listening” is the most basic form of attention to SV, while “collaboration” and “leadership” are more advanced forms that signal greater roles and agency for students. Grion and de Castro (2014) refer to this difference in the role of students as paradigms of evaluating schools: a *Measurement Paradigm* that is based on a range of performance indicators versus a *Learning Paradigm* of evaluation that is focused on self-evaluation and professional responsibility.

In contrast to elementary and secondary schools, the way in which SV is enacted and even understood **in higher education** has not been adequately addressed in the literature (Cook-Sather 2014; Seale 2009; Seale et al. 2015). The two most commonly cited purposes of SV projects in academia are (1) quality assurance or improvement (Shah and Nair 2006; Williams and Capuccino-Ansfield 2007) and (2) the professional development of faculty members (Dinsdale 2002; Campbell et al. 2007). Thus, the focus of research on the purpose of SV in academia is different from the focus of research in elementary and secondary schools, in which the dominant discourse of the SV literature is on governance, representation, and rights (Fielding 2004).

SV research in academia has been criticized for its weaknesses, particularly in relation to conceptualization of and lack of commitment to student participation and empowerment, which have the potential to transform teaching–learning processes (Seale 2009). Moreover, previous SV literature does not address the role of digital technologies in increasing students’ agency in terms of their participation and role as co-creators of the learning experience. The present study provides the opportunity to address these weaknesses and to explore how the use of digital technologies can strengthen the conceptualization and practice of SV in academia.

Related studies

The concept of SV in higher education settings has been interpreted differently in the literature (Cook-Sather 2014; Freeman 2014). Some of the early studies focused on the impact of SV on lecturers. For example, Parsell (2000) defined SV work as asking questions, which one wants to know the answers to. Verill's (2007) and Campbell et al.'s (2007) conceptualization referred to using SV to encourage staff to reflect on and consider the implications of their practice. Several studies (Freeman 2014; Tucker 2015) refer to SV as students' feedback that informs quality and contributes to evaluation processes in academia. However, SV research has found little evidence that these evaluations actually lead to any significant changes in lecturers' practice (Blair and Valdez Noel 2014). While there were studies which focused on students' perceptions of the learning process and their role in evaluating and shaping higher education (e.g., Dziuban and Moskal 2011; Kim et al. 2005; Thompson et al. 2014), they did not explicitly address the topic of SV. Taken together, the role of students as perceived by lecturers and reported in the “classic” literature on SV in higher education (for review see: Seale 2009) can be summarized through five main metaphors presented in Fig. 1: (1) student as stakeholder (Shah and Nair 2006; Williams and Capuccino-Ansfield 2007); (2) student as consumer/customer (Hart and Rush 2007; Verill 2007); (3) student as evaluator (Campbell et al. 2007; Duffy and O'Neil 2003); (4) student as informant (Campbell et al. 2007; Dinsdale 2002); (5) student as story-teller (Blythman and Hampton 2006; Campbell et al. 2007).

More recently, the term SV has gradually become synonymous with student **active participation and engagement** (Seale et al. 2015). An implicit assumption of this approach is that involving students in key pedagogical decisions about the learning content and instructional methods would make them more engaged (Bergan 2003). This approach to SV is similar to research on cognitive engagement from a socio-cultural and holistic perspective. For example, in her framework of student engagement in higher education, Kahu (2013) adopts the metaphor of a *dynamic and non-hierarchical network* of students and educators as a tool for understanding student engagement (Zepke 2011). This metaphor of the network is essentially different from the metaphors reported in the classic SV literature (Fig. 1). Consistent with the network metaphor, students are positioned as partners in the Higher Education Strategy document (The Welsh Assembly Government 2009, p. 15): “Students are partners in the higher education experience, with imagination, innovation, and creativity [...] Students are more than passive consumers of learning, they are active contributors to improving the learning environment and, collectively, to being a force for influence and change.” In practice, this partnership with lecturers may include students contributing as peers in pedagogical planning (Blau and Shamir-Inbal 2017a;

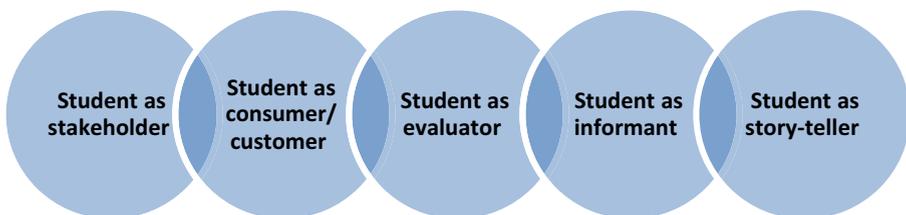


Fig. 1 Lecturers' metaphors of the role of students in student voice research in academia

Bovill et al. 2011) and working as co-creators of institutional strategies (Healey et al. 2010).

However, SV literature in academia is criticized for neither discussing the conceptualization of participation and engagement sufficiently, nor emphasizing the importance of the participation approach in conducting SV research (Bovill et al. 2011; Seale 2009). One of the few exceptions, namely Bovill and colleagues' (2011) paper, proposed three types of co-creation practices as part of their discussion of SV in academia: (1) *students as co-creators of teaching*—an approach in which faculty and students engage in reflective dialogue about what is happening and what could be happening in higher education classrooms; (2) *students as co-creators of course design*, according to which students co-create or re-create a course syllabus; and (3) *students as co-creators of curricula*, which implies, beyond co-creation of the syllabus, students and faculty working in partnership to create some or all aspects of the planning, implementation and evaluation of the learning experience.

Moreover, essential components of the conceptualization of SV in academia, including engaging students in reflection, evaluation and feedback, have almost vanished from discourse on educational policy and practice (Seale et al. 2015). One of the few examples of activities related to this conceptualization is reported in Howitt and Wilson's (2015) paper. In their study, instead of assessing science students' declarative knowledge, the course promoted the development of students' opinions about science by engaging them in discussion and reflection on what scientists do and how they themselves learn. The analysis of written reflective assignments in the course showed that students gradually developed more mature views of science, and the authors emphasized the importance of a supportive environment that respects and values students' opinions.

In the context of schools, a significant feature of SV is challenging the power dynamic, in recognition that the **power relationships** between teachers and learners are not equal (Osler 2008). Similarly, Kahu (2013) suggested analyzing student engagement as embedded within wider social, political and cultural discourses. Hampton and Blythman (2006) attempted to link their SV work to ideas of power and oppression, and argued that it is important to voice the experiences of the least powerful. Finally, conceptualizing SV work as empowerment (by opposing oppression) and transformation of the learning processes, Fielding (2004) argues for a new methodological approach that is based on "the dialogic alternative", which refers to speaking *with* rather than *for* students. This author distinguishes between perceptions of students as (1) data sources, (2) active respondents, (3) co-researchers, and (4) researchers, and argues that SV work needs to move towards treating students as co-researchers and researchers. Fielding's paper outlines the conditions for dialogic research: a collaborative setting, appropriate methods of data collection; debating with students the overall research design; production and analysis of collective research knowledge; and enhancement of the group to solve problems.

In contrast, SV literature in academia is relatively silent on the issue of power relationships between lecturers and students, and little consideration has been given to the issues of equality and empowerment (Seale 2009). For example, engaging students as co-researchers, as recently reported by Seale et al. (2015), suggests that students seem to experience "voice fatigue" i.e., resisted taking part in any aspect of the project. The authors' explanation for the students' resistance was that they could not afford to invest time in something as co-researching and become "change-agents", if it did not count towards their degree. Moreover, few students who did participate as co-researchers in the project described by Seale et al. struggled to feel the sense of ownership of the project. Read et al. (2001) argued that the possession of academic knowledge reflects the traditional

academic culture, in which social inequalities are reflected and reproduced. The mechanisms of power have become such an integral part of the learning culture and epistemology that even students appear to resist the change that comes with partnership and co-creation and prefer traditional power-based relationships with lecturers (Bovill et al. 2011). This suggests that if SV would be implemented now in academic culture, then the “next generation” of students might be more inclined to take part in partnership and co-creation.

Digital technologies can become a tool for diminishing status differences between lecturers and students, and equalizing status differences among students themselves. Previous studies on participation showed that compared to offline interactions, the online environment provides more equal opportunities for people to voice themselves, regardless of status, gender, race, wealth, or appearance (Suler 2004). The reason for this equalization effect is that online interactions diminish external and internal, real or fictitious status cues (Amichai-Hamburger 2007; Amichai-Hamburger and Barak 2009; Barak et al. 2008; McKenna 2008). This *equalization effect* of online communication has been found in several laboratory experiments (Dubrovsky et al. 1991; Siegel et al. 1986) and field studies (Blau and Barak 2012; Blau and Caspi 2010; Warschauer 1996). Most of these studies, however, tested the equalization effect through textual communication, which has been found to be different from equalization in spoken online interactions (Blau and Barak 2012).

Fielding (2004) argued that “there are no spaces, physical or metaphorical, where staff and students meet one another as equals, as genuine partners in the shared undertaking of making meaning of their work together” (p. 309). However, the equalizing effect of cyberspace can help instructors and students to become more equal and especially empower disadvantaged students (e.g., from remote regions, minorities, etc.). Proper pedagogical design of technology-enhanced courses can promote instructor-students and peer dialogue, enhance collaboration in learning and research, allow instructor-students’ co-creation of learning content, and enable epistemological change of student leadership in teaching, discussion moderation, and peer evaluation (Blau and Shamir-Inbal 2017a; Shamir-Inbal and Blau 2017).

Research goals and questions

This paper refers to SV in higher education neither as treating students as co-researchers (Fielding 2004; Seale et al. 2015), nor as contributors to faculty’s professional development (Freeman 2014; Tucker 2015). Instead, we embrace the conceptualization of SV that perceives students as partners and co-creators of their learning experiences, individually and collectively with peers (Bovill et al. 2011; Healey et al. 2010; The Welsh Assembly Government 2009). This conceptualization of SV postulates that students have a unique perspective on education. It positions students as agents engaged in analysis of teaching and learning, and even as co-creators of teaching, course design, and curricula (Bovill et al. 2011). As described above, according to Mitra’s approach “listening” is the most basic form of attention to SV, while “collaboration” and “leadership” are more advanced forms, which signal greater roles and agency for students. Consistently, we focus on the advanced forms of SV.

We also embrace the Learning Paradigm of evaluation (Grion and de Castro 2014) based on students’ own reflections and analysis. Thus, this paper explores students’ impressions of the learning experience, students’ reflections on design, monitoring, and assessment of their learning experience, and the added value of digital technologies in enhancing these processes.

To conclude, with regard to Bovill et al.'s (2011) co-creation practices of SV in academia, as well as Mitra's (2007) conceptualization of SV in schools and the Learning Paradigm of evaluation (Grion and de Castro 2014), this paper explores the following research questions:

1. How do students convey their voice in an academic technology-enhanced course by analyzing their own learning process? We examined SV with regard to the three forms of SV (*listening, collaboration, and leadership*) and with regard to *co-creation practices* (teaching, learning, assessment, and the role of technology).
2. How do students voice the benefits and challenges of their learning and *co-creation practices* in a digital environment, and consequently, which skills do students develop in order to *lead* the processes of design, teaching, learning, and assessment?

Method

Participants and context

The case study involved 54 graduate students at the Open University of Israel, who were enrolled in an M.A. program in Education: Technologies and Learning Systems. They attended the course examined in this study in two semesters during the academic year in 2015. Among the participants 42 (77.8%) were women and 12 (22.2%) men. The students were from various ethnic groups in Israeli society—25 (46.3%) of them were Arab and Druze minorities and the rest were Jews. The distribution of students' gender and ethnicity was similar in both semesters and representative for the program.

The course dealt with the concept of knowledge in philosophical and psychological aspects that are relevant to education and learning in the knowledge society. The pedagogical design of this course (detailed below) was unique in the program in terms of its explicit purpose to enable SV as listening, collaboration, leadership (Mitra 2007), and co-creation practices (Bovill et al. 2011). It also promoted embedded assessments *for* learning that would facilitate the learning process, consistent with the Learning Paradigm of evaluation (Grion and de Castro 2014). In addition, institutional decision-makers aimed to learn from implementing SV in this course regarding the appropriateness of this type of innovative learning for other courses in the program. The head of the program and the head of the department used students' perspectives in informed decision-making, hence including students in the design of future learning experiences at the level of the entire program.

The course was largely based on self-directed distant learning and included one asynchronous meeting that digitally introduced students to their classmates, presented the major themes of the course and explained how to work with various apps during the course. In four synchronous lessons, the instructor expanded on different study topics and the students presented learning outcomes, led discussions, and shared their insights. Additionally, one face-to-face meeting was held, in which the students studied in groups and decided how to coordinate virtual teamwork during ongoing course tasks.

The learning was based on the Google Apps for Education platform that enables students to easily create, edit, and share collaborative documents and presentations (Blau and Shamir-Inbal 2017b; Shamir-Inbal and Blau 2016). The synchronous lessons were held via Zoom videoconferencing system, which supports natural two-way video communication and screen sharing (Blau et al. 2017; Weiser et al. 2016).

Instruments and procedure

The case study was conducted within the qualitative research paradigm based on the description of the experience and its interpretation as presented by the participants (Guba and Lincoln 1994). This type of research provides an understanding of the phenomenon in its context and enables analysis of the data in accordance with the principles of Grounded Theory (Strauss and Corbin 1998). According to this approach, data analysis reveals a number of main themes, which facilitate the development of the initial concepts. Following that, the coding reveals secondary concepts and categories. Finally, these main themes and secondary concepts are categorized to reflect the relevant components presented in the research literature.

In addition to this bottom-up analysis of the interpretations reported by students, the researchers conducted top-down analysis of the pedagogical design of the course based on various digital sources detailed in Table 1 in the results section. The sources included: study guide with students' edits, recordings of synchronous lessons, guidelines for assignments, discussions in forums, collaborative database, shared documents with students' editing, and students' learning outcomes. The analysis was based on Mitra's (2007) conceptualization of SV, co-creation practices (Bovill et al. 2011), and the Learning Paradigm of evaluation (Grion and de Castro 2014), which were discussed in the literature review.

The study was approved by the institutional Ethics Committee. Upon completion of the course, students were asked to write a reflective document describing how the characteristics of teaching and learning were put into practice during the course activities. Personal reflections allow the examination of students' perceptions regarding processes of planning, monitoring, and evaluating their own learning (Grion and de Castro 2014). In addition, such reflections express students' insights regarding the role of technology, if it indeed has such a role, in raising their participation in active learning. Moreover, students voiced the benefits and challenges, which they experienced as a result of the course's pedagogical design. Such reflections enabled us to analyze how students improved the skills required for active involvement in the processes of design, teaching, learning, and assessment.

The reflective documents referred to the following open-ended questions:

1. Explain and provide detailed examples of the characteristics of teaching learning, and assessment associated with the course, as well as the contribution of digital technologies to the course activities.
2. Describe the transformation that you experienced as a student during this course. Refer to both challenges and benefits to your learning as a result of this transformation.

In order to ensure the sincerity of the responses, the students wrote their reflections while being unaware that the reflections would later be analyzed. The informed consent form was sent to students after receiving the course grades. It was clear to the students that their decision regarding whether or not they would participate in the research would not affect their studies. Surprisingly, all students, except for one, agreed to the analysis of their reflections.

Students' responses to the questions presented above were mapped into the following categories: teaching, learning, assessment, and the contribution of technology to learning processes and regulation (Table 2). The coding of responses relating to challenges and benefits of students' learning (Tables 3, 4) was conducted bottom-up by research assistants who were trained by the researchers, yet unaware of the research questions or of the participants' identity. Every comprehensive statement was considered a content unit and

Table 1 Course components and underlying pedagogical principles

Course components and learning activities	Underlying pedagogical principles and strategies
<p>The course website (mostly on the <i>Google Apps for Education</i> platform with <i>Moodle</i>'s discussion groups and individual assignment system) contained all of the learning materials and students' outcomes: Readings and videos, lectures pre-recorded by the instructor, presentation slides, recordings of synchronous lessons, guidelines for assignments, schedule, forums, links to collaborative documents, and learning outcomes shared by the students</p>	<p><i>Ubiquitous learning</i> Availability of the learning materials, assignments, and outcomes at any time and place enables flexibility and continuity of learning</p> <p><i>Multimedia learning</i> Learning through a variety of media sources in order to enrich demonstrations and match different learning styles of students</p> <p><i>Students as co-creators of the course design; student voice as leadership</i> Openness of the course content for students to edit, update, and enrich it</p>
<p>The course content in <i>Google Apps for Education</i> platform was open for students to edit. The students were encouraged to edit and update the digital study guide and to enrich the course materials by adding links to new content and sharing their insights</p>	
<p><i>Zoom</i> two-way videoconferencing platform for synchronous e-learning: Synchronous lessons were used for discussion of the course topics, presentation of learning outcomes by student teams, leading discussions with classmates, peer teaching, sharing personal insights regarding teaching–learning processes and teamwork experience</p>	<p><i>Students as co-creators of teaching; SV as listening and leadership in synchronous lessons</i> Developing digital competences of effective synchronous communication, learning and teaching; instructor–students pedagogical partnership; active equalized learning participation and engagement</p>
<p>Asynchronous discussion forums in <i>Moodle</i>: The students were encouraged to discuss various topics of the course through forums—to lead discussions that address the guiding questions of each topic, expand classmates' ideas, ask questions, express their opinions, and share their own experiences</p>	<p><i>Students as co-creators of teaching; SV as listening and leadership in asynchronous communication</i> Peer teaching and active construction of knowledge through participation in content-related discussions and social interactions with instructor and peers in the course learning community. Equalizing effect of asynchronous discussions</p>
<p>Mapping the course materials and creating advanced organizers through shared documents in <i>Google Drive</i>: Each course topic had an attached shared document entitled, "Document for thinking and discussion". Students, in groups of three, summed up the discussions that were held in the forums, in order to separate the wheat from the chaff and to present the main arguments of each discussion</p> <p>Students, in groups of four, were asked to analyze the statements that appeared in the forums according to the theories that they learned during the course and create an array of insights that they had reached during the analysis.</p>	<p><i>Students as co-creators of teaching; SV as leadership in asynchronous learning activities</i> Learning by doing and by peer teaching— participation in collaborative mapping of the course material and of the students' insights to create advanced organizers</p> <p>Equalizing effect of teamwork through asynchronous collaboration with peers</p>
<p>Creating a collaborative database in <i>Google Drive spreadsheet</i>: Students, in pairs, applied the course content by analyzing technology-enhanced activities according to the underlying learning theories: mapped out the type of knowledge acquired, and characteristics of learning and pedagogy</p> <p>Each pair shared the analysis with classmates through the course database</p>	<p><i>Student voice as leadership in asynchronous learning activity</i> promoting higher-order thinking by applying knowledge constructed in the course by analyzing authentic learning activities</p> <p>Sharing the analysis with classmates in the course learning community to promote peer learning</p> <p>Equalizing effect of asynchronous collaboration with peers</p>

Table 1 continued

Course components and learning activities	Underlying pedagogical principles and strategies
Assessment criteria: All assignments provided evaluation criteria for each section. Students were asked to assess their own performance according to the criteria. However, the students were not encouraged to suggest other assessment criteria or/ and methods	<i>Learning Paradigm of evaluation- assessing for learning Embedded assessment</i> at the levels of student (self-assessment), team, and learning community (peer assessment). Promotion of metacognitive thinking and monitoring of learning and performance
In several course activities, the students were asked to assess learning outcomes of classmates in their team and by other teams, to comment on their classmates' presentations, to raise questions, and to suggest improvements of their classmates' work	Equalizing effect of synchronous and asynchronous peer assessment

was counted; a unit could be a part of a sentence, a sentence, several sentences, or a paragraph. Coding was not exclusive, namely, some of the statements were associated with more than one codes. Units were associated into categories. In order to test the inter-rater reliability, a thematic analysis of the responses relating to challenges and benefits for students' learning was conducted independently by two judges and high agreement was achieved (Cohen's $\kappa = 0.92$). Few of the items, which the judges could not reach agreement about, were discussed with a third judge. The final categorization of 235 codes presented in Tables 3 and 4 is the result of full agreement between the judges.

Results

The role of teaching, learning, assessment, and technology

In order to understand in depth the context of this unique learning environment, the researchers first conducted analysis of the course components and activities that students participated in, as well as the underlying pedagogical principles and strategies (based on: Grion and de Castro 2014; Hwang et al. 2015; Mitra 2007). Table 1 presents the result of this analysis.

As Table 1 demonstrates, the course components, co-creation of the course content, synchronous lessons and asynchronous activities were designed in order to enable SV as conceptualized by Mitra (2007). Moreover, most of the activities enabled to convey not only the basic type of SV—listening, but also the advanced type—leadership. Although the course included a variety of collaborative activities, there was no evidence for collaboration in research, as conceptualized by Mitra. Embedded assessment was consistent with the Learning Paradigm of evaluation (Grion and de Castro 2014); it included self- and peer-assessment and it was designed to promote learning at the level of student, team and the course learning community. In terms of Bovill et al. (2011), students were co-creators of the course design and content and co-creators of teaching. In the future, they might be co-creators of the program's curricula; yet there was no sign for this role in the analyzed sources.

Following this analysis of the pedagogical design based on digital sources, Table 2 presents quotes that illustrate the course processes described by students in response to the first question presented in the Instruments and Procedure section. They include teaching

Table 2 Quotes that describe students' perceptions regarding teaching, learning, evaluation and the role of technology

Course processes and strategies	Representative quotes
<p><i>Teaching</i> processes and strategies: Orchestrating, Motivating, Scaffolding, Promoting metacognitive thinking, Promoting teamwork, Promoting interactions in the course learning community—Promoting student voice as listening and leadership</p>	<p>“The role of the teacher hardly included teaching the material, it was more like orchestration—management of forums and virtual lessons, design and scaffolding, guidance and clarifications, providing tools for independent and collaborative work of students. ... We studied the content in advance without instructor’s aid, so during the lesson she had the time to clarify important and/or problematic points of the course topics, and also to answer the students’ questions.” (AR)</p> <p>“The instructor ... was following comments and questions in different forums ... Her remarks ... encouraged our progress in learning the course materials ... All this was done in order to turn students that were used to passive studying to become active learners.” (NR)</p> <p>“The role of instructor in such a course is to encourage and provide motivation for participating in virtual discussions.” (DU)</p>
<p><i>Learning</i> processes and strategies Active engagement, learning by doing, participation and communication, Metacognitive thinking, Collaboration, Leading of one’s own learning and teamwork - Enabling student voice as listening and leadership</p>	<p>“Student needs to provide “earnest payment” ... because the requirement to self-study the materials of the course and apply our knowledge creatively in learning outcomes creates great demands.” (AT)</p> <p>“Collaborative work brought out several characteristics in me, such as: taking personal responsibility for learning, managing division of labor, performing tasks through interdependence, taking into consideration characteristics of our team members, contributing to the group learning processes and outcomes.” (NR)</p> <p>“There is a requirement to perform collaborative tasks, and in order to do so one needs a variety of social skills: respect and listening to others, understanding, cooperating, and avoiding conflict situations.” (RB)</p>
<p><i>Assessment</i> processes and strategies Learning paradigm of evaluation, assessing <i>for</i> learning, Embedded assessment at the level of student, team, and entire community—Promoting student voice as listening</p>	<p>“A significant part of all course assignments was ongoing self-evaluation and reflection. This encouraged metacognitive thinking, as well as monitoring learning strategies and collaborative work.” (AB)</p> <p>“Throughout the course I’ve evaluated my progress and participation in the learning activities ... I had to explain and provide specific examples in order to justify my self-assessment and peer assessment.” (RT)</p> <p>“The assessment was conducted regarding learning processes and outcomes by both instructor and students—by peers inside small teams working on the same learning outcomes, and by classmates from other groups. Important part of the learning process was carried out during the analysis and evaluation of classmates’ outcomes, and by addressing their comments to our outcomes.” (DU)</p>

Table 2 continued

Course processes and strategies	Representative quotes
<p>The added value of <i>technology</i> Improving teaching, learning, and assessment. Supporting partnership with the instructor, Enabling student voice as listening and leadership Promoting and equalizing participation, collaboration and communication</p>	<p>“The technology facilitated students’ collaboration and communication among themselves and with the instructor. It created organized learning environment that made online self-study, the use of collaborative documents, and teamwork easier.” (AL)</p> <p>“The course website served as a core learning environment. All the information and course materials, including the recordings of the synchronous lessons, were available at the website; forums were there, and collaborative outcomes also were planned, created, discussed with peers, evaluated by classmates, and edited in that learning environment.” (PH)</p> <p>“It (the platform) enabled us to edit the course study guide and to incorporate links to new relevant materials. Updating the course content required investing time, effort, and lots of thinking, but was a unique learning experience.” (NL)</p> <p>“The technology allowed the experience of being a part of learning community. We were exposed to the variety of technology-enhanced activities that promoted online collaboration, communication, and creativity through participating in forums, using collaborative documents, presentations, spreadsheets, and creating learning outcomes. Usage of the forums and <i>Zoom</i> lessons provided an opportunity to discuss in deep the course material and learning experiences, share insights, get detailed feedback from the peers and facilitation from the instructor.” (DU)</p> <p>“...Participating in forums or presenting and leading discussions in <i>Zoom</i> (synchronous) lessons is actually easier than in classrooms.” (HA)</p> <p>“Various disputes and disagreements during the course were even more open and engaging online than in offline interactions- it was simply amazing.” (AR)</p>

processes and the role of the instructor, learning processes and the role of students, assessment processes, and the role of technology in supporting teaching, learning, and assessment. The mapping of these processes (see left column) allowed us to identify core strategies related to each process and different types of SV.

As can be seen in Table 2, students had a variety of opportunities to convey their voice, collaborate and lead the course design, teaching, learning, and assessment processes. SV was conveyed in various ways: (1) by co-creation of the course content, i.e., active editing and updating the course study guide; (2) by co-creation of pedagogical design and learning experience, e.g., peer teaching in small teams, designing and presenting learning outcomes during the lessons, discussing the content and the learning process in the course learning community; (3) by co-assessment, i.e., students’ self-reflections, feedback to peers within their team and in other teams, ongoing content-related dialogue with the course community. The equalization effect of digital technologies supported this unusual partnership with

Table 3 Challenges experienced by students

Primary categories	Secondary categories	Examples of quotes
Overload and stress	Meeting schedule (N = 20)	<p><i>Participation/active learning</i> “The first and most significant challenge I faced was the assignments involving ongoing participation that were divided into different parts, with each part having a different deadline. The ongoing participation in the course was an unfamiliar requirement and sometimes I found myself feeling like I’m in a race to keep up with the schedule that was set.” (BT)</p> <p><i>Cognitive overload</i> “There was a huge cognitive overload as a result of both the requirement from the students to study the course material independently and as a result of logistical aspects of online collaborative and asynchronous work.” (AB)</p>
	Participation/active learning (N = 6)	
	Stress from competition (N = 6)	
	Information overload (N = 6)	
Collaborative-learning	Cognitive overload (N = 3)	<p><i>Stress from collaborative learning</i> “Suddenly I needed to work in coordination with others, to be considerate of others, their schedule, their opinions, sometimes change what I think ... I adjusted my own opinions and compromised according to others’ wishes in order to reach a consensus.” (SR)</p> <p><i>Interdependence and reciprocity</i> “The challenge in collaborative learning was working in groups with other students without prior acquaintance; to learn trusting others to do their work in the best way and to meet deadlines.” (MI)</p>
	Lack of collaborative strategies (N = 15)	
	Sense of personal exposure (N = 3)	
	Stress from collaborative learning (N = 3)	
	Under-developed social-emotional thinking skills (N = 4)	
Change and adaptation	Interdependence and reciprocity (N = 5)	<p><i>Changing learning habits</i> “This course was fundamentally different from other courses. As a student I was required to be very flexible. ... It was a change for me that I had to get used to.” (AT)</p> <p><i>Unfamiliar pedagogical design</i> “The course design brought me out of my comfort zone and forced me to cope with an approach that I wasn’t used to... I had to cope with changes and adapt my learning habits during ... exposure to new materials ... and course requirements that were completely unfamiliar to me.” (YO)</p>
	Changing learning habits (N = 16)	
	Technological difficulties (N = 6)	
	Unfamiliar pedagogical design (N = 8)	
	Motivation for active learning (N = 5)	
Learning regulation	Epistemological change (N = 1)	<p><i>Organizing and planning learning processes</i> “This course required a lot of time from me compared to any other course; however I felt that I was responsible for determining the amount of time and efforts invested in the course based on the requirements and my motivation.” (DA)</p> <p><i>Self-discipline</i> “This course was based on distance learning, which required seriousness and responsibility. I had to learn by myself or with my team and finish the assignments on time, without delays.” (HA)</p>
	Organizing and planning learning processes (N = 8)	
	Self-discipline (N = 7)	

the instructor, and enabled conveying SV in teaching–learning-assessment processes. In contrast to teaching and learning processes associated with SV as leadership that were supported by the course, we could not find evidence of SV as leadership related to

Table 4 Benefits gained by students

Primary categories	Secondary categories	Quotes
Learning regulation	Self-study strategies (N = 3)	<i>Learning management skills</i> “(Sometimes I found myself feeling like I’m in a race to keep up with the schedule that was set.) But this feeling helped me during the course, to learn how to schedule and determine priorities, and as a result—to learn more effectively.” (BT)
	Learning-management skills (N = 4)	
	Taking responsibility for learning (N = 5)	<i>Taking responsibility for learning</i> “I learned how to organize my schedule so that I could actively participate in discussions and update learning content. I see developing suitable learning strategies and taking responsibility for my learning as personal benefits.” (MI)
Collaboration and communication	Learning from classmates (N = 8)	<i>Content-related social interactions</i> “Most importantly—I met other students ... mostly because of the team presentations in Zoom lessons, interesting dialogue in different forums, and collaborative tasks.” (DU) <i>Gaining social capital</i> “The collaborative work experience was positive, challenging, enriching, and I have met wonderful people. Despite the fact that the course was delivered mostly online, the feeling was that the acquaintance was personal, and synchronous lessons with web-cameras enhanced this feeling.” (MI) <i>Developing collaborative learning strategies</i> “I learned that one can work very effectively on collaborative tasks and that group learning is engaging and makes the learning process meaningful. In the future, I will not fear online participation and collaboration—I will embrace it.” (MI)
	Developing collaborative learning strategies (N = 6)	
	Developing social-emotional skills (N = 6)	
	Content-related social interactions (N = 9)	
	Gaining social capital (N = 7)	
Personal and professional gains	Personal development (N = 12)	<i>Acquiring technological knowledge</i> “I acquired e-communication strategies. And most of all—I stopped fearing technology and discovered that participating in forums or presenting and leading discussions in Zoom lessons is actually easier than in classrooms. Today I’m a different learner compared to the day I started this course.” (HA) <i>Personal development</i> “For me, coping with all of the changes and innovations successfully was a positive satisfying experience that increased my self-confidence in my ability to deal with personal challenges in this type of learning.” (DB) <i>Acquiring technological-pedagogical knowledge</i> “I was exposed to new technologies, and I learned from experience how to design collaborative learning tasks (for my students) that will succeed.” (HA)
	Acquiring technological knowledge (N = 10)	
	Application of learned material (N = 4)	
	Professional development (N = 9)	
	Acquiring technological-pedagogical knowledge (N = 4)	

Table 4 continued

Primary categories	Secondary categories	Quotes
Learning and teaching	Innovative pedagogical design (N = 4)	<i>Innovative pedagogical design</i> "I was fascinated by technological integrations and the wise use of tools in order to enhance learning and co-design in the course. To me, it's innovative, interesting, and a different way of learning." (AT)
	Diverse teaching methods (N = 7)	<i>Active participation</i> "The engagement and ongoing evaluation—self-monitoring, receiving peer comments, adding insights and clarifications to the course content—helped me to understand the material better..."
	Active participation (N = 6)	<i>Meaningful learning</i> Learning in this course was fun and showed how to exploit the potential of technologies to actively engage students in order to make theoretical concepts meaningful and relevant to them." (NI)
	Meaningful learning (N = 9)	

assessment. For instance, such leadership could be deciding on assessment methods and criteria in partnership with students.

Students voicing their challenges and benefits for learning

Tables 3 and 4 present a categorization of students' responses to the second question presented in the Instruments and Procedure section: the mapping of challenges faced by the students, as well as personal and professional benefits that they gained from the course. The "N" represents the number of quotes (not the number of students). As the tables demonstrate, many of the categories revealed in this bottom-up analysis are skills and strategies that students either lacked (Table 3) or developed in this course (Table 4).

Table 3 demonstrates that conveying SV as listening, collaboration and leadership creates various difficulties for students. For instance, the requirement of active learning, pedagogical leadership and participation in the course community was perceived as a major challenge related to overload and stress (41 quotes). This was followed by the challenge of change and adaptation (36 quotes), which included, among others, unfamiliar pedagogical design and the need to change learning habits. The requirement for collaboration was also perceived by students as one of the major difficulties (30 quotes), which included, among others, lack of collaboration strategies and challenge of interdependence. Note the difference between collaboration as design-teaching-learning-assessment practices, which were extensively reported by students, and collaboration as defined in SV literature, which refers to co-researching with students and did not appear in our findings. Surprisingly, only 15 quotes reflected the challenge of learning regulation.

Table 4 shows that conveying SV is related to the variety of benefits gained by the students. The major category was personal and professional gains (39 quotes), including personal development such as coping successfully with innovations and changes. This category was followed by the gains of collaboration and communication (36 quotes), which included, among others, developing collaborative strategies and socio-emotional skills. Gains of teaching and learning (26 quotes) included innovative pedagogical design, diverse teaching methods, meaningful learning, and active participation in the learning process. In sum, students acted as both co-creators of the course design and co-creators of teaching.

Interestingly, students gradually began perceiving some of the challenges revealed in this study as benefits. For instance, as presented in Tables 3 and 4, the requirement for collaboration with peers was perceived as one of the major difficulties for students (30 quotes), but also as an important learning gain (36 quotes). Additionally, a third of the collaboration quotes explicitly refer to changes that occurred over time: while at the beginning of the course students reported struggling to collaborate with peers, gradually they developed the skills required for appropriate online group interactions that led to successful virtual teamwork. The requirements of active learning, pedagogical leadership and participation in an online learning community were perceived as both a challenge related to overload and stress (41 quotes) and a benefit related to the gains of meaningful learning, innovative pedagogical design, and diverse teaching methods (26 quotes). The challenge of change and adaptation (36 quotes) was accompanied by a variety of personal and professional gains (39 quotes). Learning regulation was difficult for students (15 quotes), but development of regulation strategies during the course led to improved learning processes (12 quotes).

Discussion

This study explored the role played by digital technologies in creating a space for SV and enhancing teaching, learning and assessment in an academic course. In this section, we begin by addressing the conceptualization of SV in academia. Following that, we discuss the role of technology in enhancing SV and promoting teaching, learning, and assessment in higher education. Finally, we address benefits and challenges of learning in digital environments voiced by students, as well as the skills that they developed in order to lead the processes of design, teaching, learning and evaluation in technology-enhanced course.

Conceptualization of SV in academia

This study embraced the Learning Paradigm of evaluation (Grion and de Castro 2014) and conceptualization of SV, similarly to schools, as partnership in co-constructing the learning experience and reflection on this experience. Under such categorization, the set of practices of SV may include active participation in discussions with lecturers and peers about the learning content, engagement in critique, editing, and updating the learning content, as well as reflection on how their own learning and teamwork are taking place (Bovill et al. 2011; Howitt and Wilson 2015). At the moment, there is a big difference between applying SV by treating students in academia as co-researchers (Seale et al. 2015) or as contributors to faculty evaluation and professional development (Freeman 2014; Tucker 2015), versus the conceptualization of SV in schools as listening to and valuing the views of pupils regarding their learning experiences, communicating their views to decision-makers, treating pupils as equal partners in the evaluation process, and thus empowering them to take a more active role in shaping or changing their schooling (Faux et al. 2006; Walker and Logan 2008). However, based on our findings, we found no proper justification for a different conceptualization of SV in academia and in schools (Kidd and Czerniawski 2011).

Consistent with the call for treating students and lecturers as peers in the pedagogical planning process (Bovill et al. 2011), students in this study were *partners and co-creators* of their learning experience. Similarly to the course “Philosophy of Science” described by Howitt and Wilson (2015), Tables 1 and 2 demonstrate that students in the course, which

was analyzed in our study, practiced active participation in discussion of the learning content, engagement in critique, editing and updating the course content. This was conducted both in teams and with the entire course learning community. In addition, the students reflected on how their own learning and their peers' learning took place. In other words, in our study partnership with the instructors and co-creation occurred in the following ways: students were (1) co-creators of the course content—by actively editing and updating it, (2) partners in teaching and co-creators of their learning experience—by designing and presenting their learning outcomes in small teams and by discussing the content and the learning process with the course community, and (3) co-creators of their assessment—by constant reflection on their own learning, by providing feedback to peers within their team, by conducting peer assessment of learning outcomes presented by other teams, and by engaging in ongoing dialogue with the course learning community. Hence, co-creation of the course content found in our study is in accordance with Bovill and colleagues' (2011) categorization of *students as co-creators of the course design*. Our findings regarding co-creation of the learning experiences and co-creation of the evaluation process are consistent with Bovill et al.'s categorization of *students as co-creators of teaching*.

In relation to Mitra's (2007) conceptualizations of SV as “*listening*”, “*collaboration*”, and “*leadership*”, we can argue that previous research on SV in schools (Fielding, 2004) and in academia (Seale et al., 2015) highlighted the switch from basic attention to SV—“*listening*”—to “*collaboration*”. However, in Mitra's terms, collaboration emphasizes a “*focus on research*” in which students work, together with other stakeholders, on conducting research that will lead to educational reform or institutional changes. In contrast, our study calls for a switch in focus from “*collaboration*” as *co-researching* with students to “*leadership*” that highlights a “*focus on change*” with students that are responsible for educational practices. Leadership is under-researched in the student voice literature—to the best of our knowledge, Mitra is the only one who explicitly related leadership to student voice and our study contributes to closing this gap in the SV literature. As can be seen from Tables 2 and 4, students had a variety of opportunities to lead the course design, teaching, learning, and assessment processes. In accordance with Cruddas and Haddock's (2003) claim, we argue for the importance of listening to students' reflections in order to understand whether and how teaching–learning–assessment processes meet their needs. Also, students' creative ideas can inform of the necessity of further changes.

In contrast to co-researching, embedded assessment at the student, team, and course learning community levels serves the needs of both students and lecturers. For students, metacognitive activities of monitoring their strategies and performance help to improve learning in the course and to promote life-long learning skills (Bolhuis 2003). For lecturers, embedded assessment is a form of ongoing student feedback. In terms of metaphors found in the literature on SV in academia (Seale 2009) and discussed above, the students in our study were neither consumers, nor a pure version of the other four metaphors—stakeholders, informants, evaluators, or story-tellers. Instead, they were involved in self-assessment, assessment of their peers, and the role of the instructor; they constantly told the story of their learning to themselves and to others in order to adjust their learning strategies and improve understanding. Among the metaphors of SV discussed above, our findings are consistent with Kahu's (2013) metaphor of a “*dynamic and non-hierarchical network*” of students and educators as a tool for understanding student engagement. Through the leading of presentations and discussions during online lessons, ongoing self-evaluation and self-reflective story-telling, students contributed to the pedagogical design of the course, and became stakeholders and co-creators of their learning experience. In Mitra's terms,

they conveyed SV as *leadership* in pedagogical design and in technology-enhanced teaching–learning processes (Tables 1, 2). In contrast, although self- and peer-assessments were embedded in the course activities, SV was conveyed in assessment in the form of *listening* rather than leadership (Table 2). We recommend enabling such leadership by encouraging partnership with students, with regards to deciding on assessment methods and criteria.

Personal communication in the program and department revealed that students’ feedback not only facilitated the professional development of the instructor, but also provided valuable information for educational decision-making by the Head of the Program and the Head of the Department in relation to the entire degree. However, evaluating the appropriateness of this type of innovative learning for other courses in the program (i.e., students as *co-creators of curricula*; Bovill et al. 2011) was a secondary purpose of the project and was conducted without co-researching with students. The main purpose was co-creation of students’ own learning experience, and by being constantly involved in co-designing their learning experience, the participants acted as “change-agents” (i.e., students as *co-creators of the course design* and *of teaching* in terms of Bovill et al.). The result of engaging student as co-researchers, as reported in a recent project by Seale et al. (2015), highlighted the difference between the vision versus the reality of positioning “students as research partners” in the current academic culture. The phenomenon of “voice fatigue”—students’ resistance to co-research, and the absence of ownership of the research project as perceived by those few students who did volunteer to participate—suggests that the process was important for the researchers, but not for the students. We believe that “*the dialogic alternative*” (Fielding 2004) for SV in academia should not be co-researching for institutional purposes, but rather ongoing evaluation for improving the learning experience of the students during the course and for improving teaching–learning–assessment in the degree in general. Instead of the collaborative research suggested by Fielding, the course analyzed in our study transformed the division of power between instructor and students during the course and, following that, analyzed students’ open-ended reflections on their learning process—as individuals, teams, and the learning community of the entire course.

Based on Bovill et al.’s (2011) description of students as (1) co-creators of teaching, (2) co-creators of course design, and (3) co-creators of curricula, we can argue that changes in traditional learning practices in our study increased SV and helped to create a fruitful partnership in co-designing the learning process. This can occur when the emphasis of the SV approach is switched from dissemination of power through co-researching to dissemination of power through nurturing the role of students as partners in pedagogical design. Moreover, we suggest adding to Bovill et al.’s conceptualization of SV the important element of perceiving students as (4) *co-creators of their learning experience*. Based on our findings, this can be achieved by having deeper student engagement in learning and taking responsibility for their learning process, by an ongoing dialogue in a course learning community and peer facilitation, by collaboration on learning processes and outcomes, and by embedded self- and peer-assessment. However, such realization of SV as true pedagogical partnership and co-creation involves a radical change in academic culture.

Technology for enhancing SV and promoting teaching, learning, and assessment

Digital technologies supported the dissemination of power and leadership in teaching–learning processes demonstrated in this study. Consistent with the claim of Bovill et al.

(2011) regarding the importance of co-creation with students, the instructor in our study used technologies to invite students functioning as partners in pedagogical planning. The instructor promoted co-creation of the content by making it possible for students to edit and update the course content in the collaborative *Google Apps for Education* platform (Blau and Shamir-Inbal 2017a, b). During synchronous lessons through the *Zoom* videoconferencing system, the instructor transferred the screen sharing function to the team of students, who led the lessons, presented their collaborative learning outcomes and held synchronous discussions. The participants perceived this act of transferring the screen sharing function to students as a symbol of an epistemological change in the traditional power status quo, as *giving up the knowledge ownership* (Blau and Caspi 2009; Caspi and Blau 2011) usually held by the lecturer. In these synchronous lessons as well as in several asynchronous activities in the shared documents and forums, student teams led the learning process and were responsible for teaching their classmates. In addition, students in this study were constantly encouraged to share their views, experiences, and insights with others. Both synchronous lessons and asynchronous discussions during the course promoted ongoing dialogue between the instructor and students and among peers. This “*dynamic non-hierarchical network*” (Kahu 2013) connected the instructor, majority and minority students—across the differences in position or perspective.

In addition to the willingness of the instructor to engage in pedagogical co-design and the division of power, the students’ openness can be attributed to the *equalizing effect of digital environments* that diminishes status cues (Blau and Barak 2012; Dubrovsky et al. 1991; Siegel et al. 1986; Suler 2004). The majority of previous studies tested the equalization effect in asynchronous textual communication and not in a learning context; some research reported the equalization effect of participation in audio conferencing compared to the participation of the same pupils in face-to-face lessons (Blau and Caspi 2010). Participants in our study were graduate students at a distance learning educational institution, which is committed to providing equal educational opportunities to all students, including students living in remote regions and minority students. Synchronous lessons, extensive asynchronous interactions between students in small groups, preparing collaborative learning outcomes, and continuous dialogue in the course learning community diminished differences between the students and opened the window for more equal learning experiences and active participation in the course activities.

SV in practice: benefits and challenges of learning in digital environments

Similarly to a previous study which focused on putting the SV approach into practice in academia (Seale 2009), the participants’ reflections in the current study revealed both *benefits and challenges*. Several factors that were found in Seale’s study as promoting student learning—supportive tutors, flexibility, and sharing and communicating with peers, as well as workload as a factor that hindered learning, were also found in this study (Tables 3, 4).

However, other factors, such as knowledgeable and expert tutors (promoting factor), lack of information, and poor communication (hindering factors) were not replicated in our study. In contrast with the power status quo reflected in the challenges in Seale’s study, the instructor of the course analyzed in our study did not function as an expert who transmitted information to the students, but rather as a facilitator who perceived students as knowledgeable enough in order to co-create the course content and teach their classmates (Shamir-Inbal and Blau 2016). The instructor promoted peer communication in the community and collaboration in teams as part of the core pedagogical design. This pedagogical

design enabled students to practice the important skills involved in the teaching–learning–assessment processes included in our perspective on SV as leadership discussed above: (1) co-design of content, (2) co-teaching, (3) co-creation of learning experience and outcomes, and (4) embedded co-assessment *for* learning. We believe that this epistemological change through ongoing dissemination of power and nurturing the leadership skills of students during teaching, learning, and assessment is the way towards real partnership with students and promoting SV.

Limitations and future work

This paper discussed the conceptualization of SV in academia, as well as explored the role which digital technologies play in the equalization of participation and in changing the power status quo between lecturer and students. However, it should be taken into consideration that the analysis was conducted in two semesters of one graduate course at one academic institution. This is consistent with recommendations presented in the literature (e.g., Kahu 2013) that projects which focus on student learning experiences, should use qualitative methodologies and limit themselves to a single institution. Future studies may continue exploring SV in academia using qualitative research methods, but in different courses and different types of institutional culture.

Although this qualitative study analyzed the data of a large sample, it mostly focused on the students’ perspectives. In addition, the researchers analyzed digital sources of the course components and their underlying pedagogical principals. Future studies may address the instructor’s perspective in order to triangulate it with reflections of students and analysis of pedagogical design and hence strengthen the validity of the findings.

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