

Dialogical positions as a method of understanding identity trajectories in a collaborative blended university course

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Abstract Recent learning sciences literature proposes to conceive learning as changes in the learner's identity trajectory. In this paper, we use the analysis of dialogical positioning as a method to track down and understand shifts in identity trajectories. The Bakhtinian concepts of "polyphony" and "chronotopes" are considered as dialogical indicators of the identity positions, and are the basis of our method. A qualitative/quantitative nature is featured in this method, which is composed of three steps: a) reading of the data; b) definition of a tailored list of dialogical indicators; c) quantitative analysis. A highly collaborative, blended university course, drawing on socio-constructivist principles, was used as the context to test the method. Indeed, we believe such a course would foster dialogical identity development. All the notes posted online during the course by two selected students were used as the corpus of data. The students were selected because of their diversity in terms of level of participation and initial technology propensity. The application of the method revealed the uniqueness of the trajectories, the correlations between indicators, and their sensitiveness to the activities of the course and to the students' personal circumstances.

Keywords Blended learning · Chronotopes · Dialogical learning · Identity trajectory · Polyphony

Introduction

Recently, educational theories have conceptualized learning as strictly connected to identity (Brown and Campione 1990; Ligorio and Cèsar 2013; Wenger 1998; Wortham 2004). Participation in educational activities affects the way we perceive and present ourselves.

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When students participate in learning experiences, they not only acquire new knowledge and skills or simply learn how to do something; their identity actually develops. They 'become' something/someone different. For instance, taking a course in psychology does not just mean learning psychology or understanding how to administer a test. It means 'becoming' a psychologist; therefore the concepts and expertise connected to psychology enter the student's identity and produce a shift from the periphery to the center of a practice and consequently from being a novice to feeling like an expert (Lave and Wenger 1991; Wenger et al. 2002).

Although these concepts seem to be widely accepted, adequate methodologies are lacking to understand the identity trajectories students develop during their participation in a learning context. In this paper, we propose a method that is capable of tracking these trajectories by looking at identity positioning. In the next section we will address our definition of identity positioning, based on the dialogical approach and in particular on the concepts of polyphony and chronotopes, which we consider to be indicators of dialogical identity. Later, our method will be described in detail and examples of applications will be presented.

Learning as identity trajectory

The contemporary vision of learning has overcome the concept of learning as being exclusively the acquisition of knowledge and competences. The concept of 'learning trajectory' is now used to stress the diversity and multidimensionality of learning processes. The socio-historical and constructivist approaches strongly influenced the visions of 'learning trajectories', especially by introducing the idea of learning as knowledge building (Scardamalia and Bereiter 2006), achieved through active participation in a community (Brown and Campione 1990; Wenger 1998). By accepting that learning is much more than just acquiring knowledge or competences, it becomes a more complex process, involving developmental changes intertwined with the activities performed, the tools used, and the interactional construction of knowledge (Bruner 1990, 1996; Cole 1996; Ligorio 2009; Rogoff 1995). Learning always provides an ontological change in identity (Packer 1999).

In a recent overview of this concept, Lahn (2011) recognizes four types of learning trajectories: (a) Educational learning trajectories, referring to formal stages in a school subject organized so as to support students' understanding of notions; (b) Informal learning trajectories, concerning adult education, career development, and the so-called 'lifetime learning'; (c) Organizational and community learning trajectories, about both ladders in occupational careers and horizontal moves that turn newcomers into proficient professionals; and (d) Epistemic trajectories, that attain knowledge development.

In this paper, we maintain that the four types of trajectories described by Lahn (2011) do not sufficiently explain the identity trajectories implied in learning. When attempting to understand learning processes, learners should be considered in their totality, encompassing ways of understanding concepts and ways of participating in contexts, as well as learning strategies. The development of these positions can be read as a process through which learners incorporate new ways of being and interacting (Vågan 2011). Therefore, we propose to look at the identity trajectories taking into consideration students' identity positions. We found the concept of I-position – as conceived by the Dialogical Self Theory (DST) (Hermans 1996) – a useful tool for understanding identity trajectories. The Bakhtinian (Bakhtin 1986) concepts of polyphony and chronotope are strongly embedded in this theory. Positions are provided by 'voices' interacting with each other, thus creating polyphonic

identity processes. The polyphony can be placed in chronotopes, defined by Bakhtin (1981) literally as 'time-space', a unit of analysis for studying texts according to the ratio and nature of the temporal and spatial categories represented. The distinctiveness of this concept, as opposed to most other uses of time and space in literary analysis, lies in the fact that neither category is privileged; they are interdependent. Chronotopes represent the connectedness between temporal and spatial dimensions capable of organizing the narrative event, the fulcrum around which an experience can be communicated. Bakhtin himself notes that "the image of a man is always intrinsically chronotopic" (1981, p. 16), pointing out the relevance of this dimension for the Self.

Some authors argue that chronotopes are not confined to the literary genre, but can be seen at play in everyday activities (Brown and Renshaw 2006; Holquist 2009). In particular, chronotopes can be found in discourses, giving accounts of actions and verbal reports through which people construct the meaning of activities. Such chronotopes, which could be defined as chronotopes-in-action, may describe ways in which the ongoing activity makes different spaces at different times relevant (Ligorio and Ritella 2010). By looking at chronotopes-in-action, the spatial and temporal dimensions through which positions are taken can be understood. Indeed, chronotopes are devices that allow a calibration of the time/space coordinates without which identity positions would be impossible (Raggatt 2007). As the Self develops and expands, so too does *its* chronotope – or rather, the development of positions implies a set of developing chronotopes as well.

The DST offers a good starting point to describe the trajectory of positions. The Self is seen as a set of I-positions, constantly in movement and always changing (Hermans 2004; Hermans and Hermans-Konopka 2010), according to contextual factors, past and future perspectives, and to the people and tools one may come into contact with. The structure of such a dialogical Self is better understood by observing the chronotopes within which the polyphony occurs.

The mediation of technology

Technology can play a role in supporting and empowering changes in learners. The socio-constructivist and cultural approach assigns to technology the role of a mediational tool (Cole 1996; Muukkonen et al. 2005). Such mediation is not neutral. Some authors have ascertained that technology, when carefully introduced in a learning context, has the potentiality to add a dialogical nature to collaborative learning (Koschmann 2001; Ligorio 2010, 2011; Renshaw 2004; Silseth 2012; Trausan-Matu et al. 2008; Wegerif 2006). For instance, using a web-forum may support student-student interaction in addition to student-teacher interaction, more typical in traditional face-to-face contexts. Multiple interaction, where online and offline communication is well integrated, becomes a rich dialogical learning situation, where many 'voices' enter the scene and students also consider their peers – and not only their teachers and books – as a source of knowledge and understanding. Online learning experiences, based on collaborative activities aimed at discussing concepts and building knowledge, can influence students' identity trajectories.

Blended educational activities, which combine the use of online communication and face-to-face interaction, are interesting occasions for dialogical learning to occur because of the multiplicity of communication formats available together with the various activities students can undertake (Bonk and Graham 2006). Multiple discursive threads and diverse occasions to express ideas and knowledge allow technology to become a new character in the polyphonic relation featuring identity trajectory and a further possible element composing

the dialogical structure of the Self (Black et al. 1983; Ligorio 2001). By using technologies, the space and time for dialogue is expanded and the dialogical dimensions of communication are amplified (Wegerif 2007), favoring the construction of a collective knowledge founded on the sense of an 'I' as a part of a new 'We', rather than learning as the patrimony of single individuals.

At the same time, technology introduces new space-time dimensions that complement and intertwine with the time and space of face-to-face communication. For instance, students writing and posting messages on learning web-forums can read each other's notes long after they wrote them, thus creating a space where remote and present times are reunited within the space of the forum (Bretz et al. 1976).

The aim

The aim of this article is to describe an innovative methodology that is capable of grasping, mapping and describing the dialogical dimensions of participants in learning contexts. A number of methods for understanding identity development have already been proposed. For instance, Bagnoli (2004) describes a multi-method autobiographic approach based on narrative activities such as interviews, personal diaries, and photos. Wortham (2004) uses a dialogical analysis based on the identification of pragmatic discursive indicators which represent possible clues for an in-depth interpretation of narratives. Other authors (Jasper et al. 2011) report different methodological elaborations characterized by self-report questionnaires (Rowin'ski 2008), anthropological data (Gieser 2008), interviews (Aveling and Gillespie 2008) and biographies (Barresi 2008; Gillespie 2005). Finally, Hermans (1999; Hermans and Hermans-Jansen 1995) elaborated a self-confrontation method based on the construction of self-reported narrative and its evaluation.

The method we propose adds to the conceptualization of dialogical positions – discussed in the theoretical part of this paper and much the same as many of the methodologies used by the authors we quoted above – the capability of tracking down the dialogical positioning in a learning context based on students' verbalizations occurring while learning activities are performed. Though it has many points in common with other methods, ours is not based on biographical self-reports nor on intentionally provoked data; instead, we use what students say while participating in a learning context. The main aim of this method is to map and follow students' identity trajectories, developed within learning contexts, and to reveal their dialogical structure.

To test this method we refer to a course we consider potentially capable of triggering identity changes because of its strong collaborative and dialogical nature. The course is described in the following section.

The context

The context used to test our method involved a blended university course, with online activities delivered on a (freely available) platform called Synergeia (bscl.fit.fraunhofer.de), and offline activities held in a standard university lecture room. The combination of offline and online activities was carefully designed to avoid a replication of the activities or a disproportionate use of one of them (Bonk and Graham 2006).

The course, labeled 'Psychology of E-Learning', was offered by the University of Bari (IT), as part of the curriculum at the specialist level of Work and Organizational Psychology.

The course lasted 12 weeks; during the academic year from which we selected the data used for this paper, 18 students enrolled (average age 24 years old; 3 M, 15 F). The content was organized in six modules; five of them covered the curriculum of the course - Educational theories, Digital identity, Learning objects, Open Source, New trends in e-learning - and the last module was devoted to the collaborative construction of a checklist to observe and assess E-learning courses implemented elsewhere. Two groups of nine students were randomly formed. Each group worked in parallel although many activities were interdependent; for instance, each group had to assess and compare the materials produced by the other group. At the time of the third module – halfway through the course – the groups were recomposed so as to allow students to test within a new group the competences and knowledge they had acquired so far.

Each module was guided by a specific research question launched by the professor, so that all the activities composing the module were aimed at reaching a shared answer to that question. A face-to-face lecture always initiated the module. Right after it, the professor assigned each student a reading material (e.g. a book chapter, a journal article) covering part of the content of the module. Each student was required to study the material assigned and to write a short review, meant to extract useful information for answering the research question. Similarly to Jigsaw groups, once all the reviews were posted online, students read them all with the aim of comparing and integrating the information contained in them. By comparing and discussing the reviews, and as they would in a puzzle, students were to compose the content of the module and negotiate a common answer to the module-research question. This way the discussion - mainly occurring via web-forum - was triggered by the reading material and led to the creation of a group product, for instance a conceptual map, reporting the various points discussed, the links between the points and the group answer to the module-research question (Ligorio and Cucchiara 2011; Ligorio et al. 2010).

The web-forum used was equipped with the so-called ‘thinking types’, labels assigned to each note to mark the intention of the writer – for instance, “my idea”, “a problem”, “a theory” –, thus prompting students’ metacognitive reflection about what to write. The thinking types were clearly inspired in the seminal work of Scardamalia (2004) with the Knowledge Forum educational platform.

During each module and within the groups, students covered different roles, intentionally designed to promote active learning and responsibility taking (Spadaro et al. 2009). These roles were:

- a) E-tutor, responsible for monitoring the group discussions around the research question leading the module;
- b) Process analyst, assessing the discussion once concluded, reflecting in particular upon the distribution of the thinking types;
- c) Map-leader, taking the lead of the construction of the group cognitive map containing both the concepts discussed while negotiating the answer to the research question and the links between the concepts;
- d) Critical friend, commenting on the products and activities of the other group and comparing the group products with the aim of outlining hints and suggestions to improve the products in the subsequent modules;
- e) Checklistler, supervising the construction of a common product, which in the case of this course consisted of a list of useful points for assessing other online courses. This list of points is finalized during the last module. Since the final output for this role is one common list – and not one for each group – this role should maintain a good connection between the groups.

Additionally, students were required to maintain personal e-portfolios where they could informally talk about themselves, report their expectations about the course, reflect upon the various activities they had undertaken, and select their best product for each module accompanied by a justification for their choice. Furthermore, they were required to fill in a sheet where they stated what they had learned in each module and their personal goals for the next module (Impedovo et al. 2013).

All the activities included in the course were designed to improve collaborative and constructive learning so as to replace rote forms of learning with peer discussions, focus on the construction of products and alternation of individual and group work. Therefore, we believe this course has the potentiality to impact students' dialogical identity positions and their trajectories.

The structure of this course was truly innovative considering the general context of the university within which the course was offered. Indeed, this was the only course delivered in this mode; all the other courses of this university were delivered in a traditional face-to-face mode.

The method

The method we propose has a qualitative/quantitative nature and can be applied to discourse data. The analysis has a strong dialogical perspective (Bakhtin 1981) and attention is on students' utterances, analyzed by using a qualitative interpretation (Atkinson and Hammersley 1994). As discussed in the theoretical background, we consider polyphony and chronotopes as dialogical features of students' positioning. Therefore we looked for these indicators in the students' utterances. During the most qualitative phases, two researchers read all the material and discussed the controversial cases with a third researcher. A total agreement was sought and reached.

The method consists of three steps:

- *Step 1: Reading the students' material.* First we read all the material students produced throughout the course. In the specific case presented in this paper, we used the notes produced by the students as the corpus of data. The notes were automatically recorded by the platform. Discussions and statements produced face-to-face could also be considered part of the corpus of data, as long as this data was recorded. The reading of the corpus is finalized to have a list indicating the positions the students cover. These indicators are the 'voices' used and the chronotopes emerging from the text. We believe each corpus of data may generate a specific list, therefore this method provides great personalization and adaptation to the specific corpus used. Voices and chronotopes retrievable from the data depend on the context analyzed.
- *Step 2: Defining the list of dialogical indicators.* Such a list is defined through several readings and re-readings of the material and a few rounds of discussion among the analysts. As already mentioned, the final list obtained may vary depending on the context and on the students, therefore the list we produced, reported in Table 1, is indeed the list of indicators found in our data and should be considered as an example of possible indicators.
- *Step 3: Quantitative analysis.* Once obtained the final list of dialogical indicators, the analysts counted how frequently they emerge in the data. In order to detect the trajectory, the material produced by the students should be segmented in slots of time covering the course so as to sketch the students' trajectory. In our case, because of the modular structure of the course, we collapsed the students' notes into six sets, each of

t1.1 **Table 1** List of dialogical indicators

t1.2	Voices composing the polyphony					Features of the chronotopes	
t1.3	I	We	Other voices in the course (you, he, she, etc.)	Voices of others (society, friends, family)	Educational materials and authors read for the course	The here and now of the course	Learning contexts in the past

them corresponding to a module. By comparing the frequency of the dialogical indicators in each module it is possible to map the identity trajectory of each student. Statistical tests (such as Chi square, linear correlations, ANOVA) are used to measure the degree of correlations and interdependency between the indicators. In this manner it will be possible to better understand the dialogical dimension of the trajectory, considering that the more the elements are interwoven the stronger and deeper the dialogicality will be. For instance, the Chi-square calculated for all the indicators is useful to understand how these indicators are interconnected, whereas linear correlations allow us to analyze how strong their interdependency is. The ANOVA test clarifies the direction of such interdependency.

– All the statistical tests can be run by using SPSS and, in our method, are led by the objectives of tracking the students’ identity trajectories and of understanding the dialogical relationship between the indicators retrieved from the data.

The aim of our three-step method is to propose a multidimensional approach that is capable of investigating identity trajectories through both quantitative and qualitative lenses. That is to say, by both synthesizing data and analyzing them in depth.

To give a clear overview of how we apply the method we will provide two examples of two students selected from the course and described in the following section.

The two selected participants

To exemplify our method, we tested it on all the notes posted online by two students. In introducing the two participants we selected, we will use the nicknames they chose when they entered the course. All the personal information here reported is taken from the informal section of their e-portfolios. Both are female, the same age (24) and have very good academic profiles. The reasons we selected them are that they differ in terms of quantity of participation — one very low, the other very high — and because of their inclination toward technology — one rather negative and the other very positive.

Our first participant used the nickname Vitty41. She introduced herself as a sociable person and as a girl with traditional values. She declared she had a moderate knowledge of technology although she had never used any digital environment for education. Her experience with technology was limited to social networks and she had some initial resistance to using the online platform. Definitely, she did not consider herself a good technology user. During the course, she posted 99 notes in total, which showed a rather low participation in the course. Indeed, Vitty41 was one of the participants with the lowest number of notes posted.

The second participant chose the nickname MaryBull and she described herself as a girl with many interests and hobbies, very active and a fan of innovation. She considered herself a very technological person and kept a very accurate personal blog and a rich Facebook profile. She was already familiar with many educational platforms, including the one used for this course. She was very active and productive throughout the course, during which she posted 248 notes in total; indeed, she was one of the most active writers in the course.

Results

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For each student we first looked at the general trend of the frequency of the dialogical indicators by comparing the six modules. These trends give an idea of the trajectories along which their learning identity developed. Later, we calculated the percentage of the frequency so as to perform statistical tests. In discussing the results, we took into account the role students played during the modules and the general activities and situations occurring during the course.

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Vitty41: From I-voice to many voices within the course-situated chronotope

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As regards Vitty41, our expectation was not to find relevant changes in her positioning because of her low participation and negative predisposition toward technology. Nevertheless, Vitty41 had some interesting developments that are traceable when looking at her trajectory, as reported in Fig. 1.

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By looking at Fig. 1, we can see how Vitty41 was initially centered on individual positioning – expressed by the I-voice. This voice reached its peak in module 3, just before the re-composition of the groups. Next, during modules 4 and 5, when the new groups were active, the I-voice was considerably less used and external voices were more frequent. Therefore, we can assume that Vitty41 reinforced her individual voice whilst she stayed in the original group. Once she was part of a new group, the I-voice was less present. Furthermore, during modules 1 and 2 she had roles to play: in module 1 she was the map-leader and in module 2 she played the role of the tutor. Finally, during module 3 she was role-free and she may have felt more in a position to talk with her own voice. Module 5 reported the peak of the external voices and the voices from the educational material. No role is played during this module, therefore this output can be interpreted in connection with the participant's personal evolution.

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In terms of chronotopes, Vitty41 was exclusively focused on the course. Her chronotopes were always situated within the course and she never referred to chronotopes outside of the course. The only space-time coordinates she evoked were that of the here and now of the course. No other learning chronotopes were ever mentioned.

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By analyzing each module with statistical tests, specific interplays between the dialogical indicators could be retrieved. None of the statistical tests that were used produced significant results when applied to modules 1, 5 and 6 because of such low participation. In module 2, a significant Chi-square was found between the I-voice and the course-situated chronotope ($\chi^2(2)=11.47; p<.01$) and, conversely, the I-voice and other voices of the course were negatively

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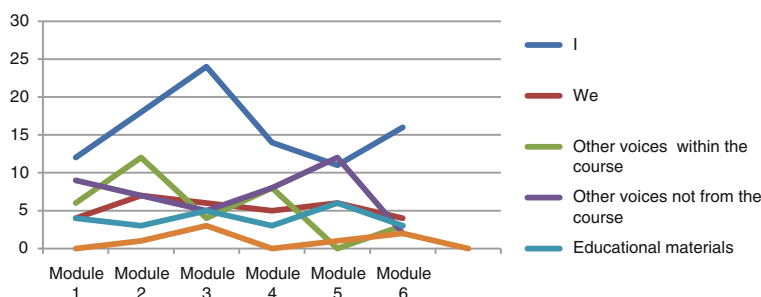


Fig. 1 Vitty41's dialogical trajectory based on the frequency of the indicators throughout the modules

correlated ($\rho = -.45$; $p < .05$). Therefore, the I-voice was competing with the other voices of the course and it was used to describe the course chronotopes.

During module 3, only a negative correlation between I and We voices was found ($\rho = -.57$; $p < .05$). A positive correlation was found between the We-voice and the voice of the educational material ($\rho = .83$; $p < .01$) and between the We-voice and the course-situated chronotope ($\rho = .53$; $p < .05$). This module also displayed an interesting impact of the course-chronotope on the We-voice ($F(1) = 4.71$; $p < .05$). Again, I and We-voices were competing and this time the course chronotope was designated by using the We-voice.

In module 4 a positive correlation was found between the educational material and the course-situated chronotope ($\rho = .57$; $p < .05$). According to the ANOVA test, the course-situated chronotope has an impact on the educational material ($F(1) = 7.06$; $p < .05$). Now the course chronotope is voiced through the educational material.

In synthesis, we can say that Vitty41's trajectory was steadily marked by the prevalence of I-voices, while the We-positioning remained more or less the same. An interesting inversion of trends between the I-voice and external course voices was observed in module 5, although this trend was not significant according to the statistical tests. Despite the use of external voices, the chronotope always remained confined in the course.

In terms of polyphony, we can claim that in the case of Vitty41 the absence of roles following a sequence of two roles played may have strengthened Vitty41's I-voice. The inclusion in a new group lowered Vitty41's I-voice and her ability to include other voices could be an effect of the progression of the modules. Chronotopes, when traceable within the text of the notes, were confined to the here and now of the course. Within some modules, it was possible to see interesting correlations between the voices, and during the third and the fourth module the chronotope situated in the course had an impact on the We-voice and on the educational material, respectively.

MaryBull: From a variety of voices and chronotopes to a silent polyphony

MaryBull was one of the most active participants, therefore we expected to find an identity trajectory with many interesting changes and developments. Indeed, MaryBull's trajectory, as displayed in Fig. 2, presented remarkable aspects.

Just like Vitty41, MaryBull's I-voice was strong, but this time the peak was in module 4, when the new groups had just been formed. During this same module, all the other voices had their highest frequency and the outside-of-course chronotope started an increasing trend that continued in module 5. Looking at the table we can see how all the voices used by

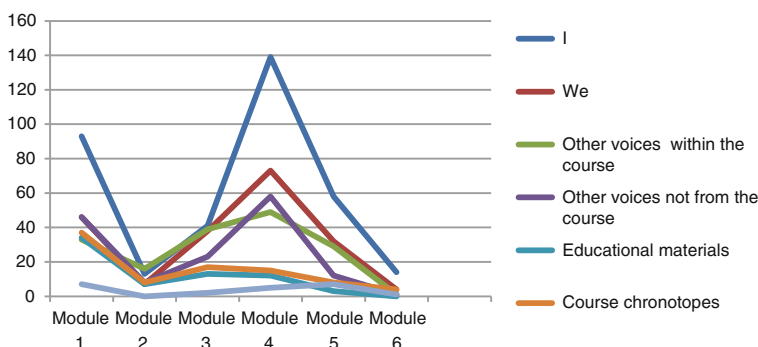


Fig. 2 MaryBull's dialogical trajectory based on the frequency of the indicators throughout the modules

MaryBull seem to follow more or less the same trend: a high frequency in the first module, a dramatic drop in module 2, an increase during the third module, a peak in module 4 and a decreasing path involving modules 5 and 6.

She covered the role of tutor in module 1 and that of check-lister in module 2. During these two modules, although the I-voice was the most frequent, the other voices were equally present. From module 3 onwards, when she had no role to play, the I-voice became stronger and gradually the difference of frequencies between the different voices increased. In module 6 the polyphony became less rich, with some voices almost silenced, such as the other voices from the course.

The chronotopes had different trajectories: initially, from module 1 to module 4, there was a higher presence of the course-situated chronotope. During module 5 the two types of chronotopes reported more or less the same frequency, because of a lower presence of the course chronotope and a higher frequency of the out-side course chronotope. Finally, in module 6, the two types of chronotopes had a similar low frequency.

As for the preceding case, again statistical tests (Chi-square, linear correlations and ANOVA test) were run to better understand how the dialogical indicators were related to each other in each module.

Module 1 is featured by a significant Chi-square relation between the We-voice and the course-situated chronotope ($\chi^2(2)=20.34$; $p<.01$). MaryBull seemed to talk about the course by using the We-voice. Furthermore, the ANOVA showed that the course-situated chronotope significantly affected the We-voice ($F(1)=28.72$; $p<.01$). Linear correlations were found between the I-voice and other voices from outside the course ($\rho=0.47$; $p<.01$), and between the We-voice and educational material ($\rho=0.28$; $p<.05$). The I-voice was used together with voices coming from outside the course whereas the educational material was voiced together with the We-voice.

During module 2, the I-voice was significantly and positively correlated with other voices from the course ($\rho=.68$; $p<.05$). This may imply an attempt to associate the I-voice to the other voices from the course and, because the latter were not so frequent, this may explain the dramatic drop of the I-voice in this module.

In module 3 a significant Chi-square relation was found between the We-voice and the course-situated chronotope ($\chi^2(2)=11.68$; $p<.01$). Furthermore, in this module the course-situated chronotope also had a positive correlation with the other voices from the course ($\rho=.22$; $p<.05$). Indeed, the ANOVA showed that the course-situated chronotope significantly impacted the We-voice ($F(1)=12.94$; $p<.01$) as well as the other voices from the course ($F(1)=4.03$; $p<.05$).

The data from module 4 reported many significant Chi-square relations. The I-voice correlated with both the course-situated chronotope ($\chi^2(2)=11.01$; $p<.05$) and the outside-of-course chronotope ($\chi^2(2)=15.18$; $p<.01$). This means that the I-voice was in charge of expressing both the course and the outside-of-course chronotopes, which explains the dramatic rise of this voice. Significant correlations were also found between the course-situated chronotope and other voices from the course ($\chi^2(2)=4.46$; $p<.05$) and the educational material ($\chi^2(2)=12.92$; $p<.01$), proving that the course-situated chronotope was populated by voices from people and material of the course. Furthermore, many positive significant linear correlations emerged from the analysis: a) between the I-voice and other voices from the course ($\rho=.18$; $p<.05$); b) between the I-voice and the course-situated chronotope ($\rho=.20$; $p<.05$); c) between the I-voice and the outside-of-course chronotopes ($\rho=.26$; $p<.01$); d) between other voices from the course and the voice from outside the course ($\rho=.25$; $p<.01$); e) between the educational material and the course-situated chronotope ($\rho=.29$; $p<.01$). The ANOVA showed that the course chronotope significantly

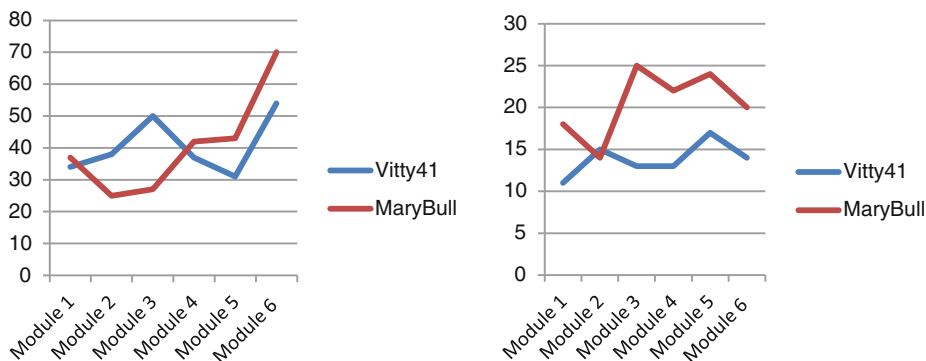
impacted the I-voice ($F(1)=6.02$; $p<.05$), the voice of others from the course ($F(1)=4.53$; $p<.05$), and the educational material voice ($F(1)=13.91$; $p<.01$). As we can guess just by looking at Fig. 2, this module presented a rich and complex interweave between the many voices MaryBull expressed and between the voices and the chronotopes she described. For MaryBull, this module was very dialogical and it represented the apex of her participation.

Module 5 also reported many Chi-square significant relations. The I-voice correlated both with the course-situated chronotope ($\chi^2(2)=7.86$; $p<.05$) and the outside chronotope ($\chi^2(2)=5.99$; $p<.05$). The I-voice was also responsible for describing both chronotopes. A further correlation was found between the We-voice and the course-situated chronotope ($\chi^2(2)=9.74$; $p<.01$), showing how the We-voice was used in this module to describe the course. Several positive linear correlations occurred as well. The I-voice correlated with the other voices from the course ($\rho=.27$; $p<.05$), the course-situated chronotope ($\rho=.34$; $p<.01$), and the outside chronotope ($\rho=.26$; $p<.05$). The We-voice and the course-situated chronotope also correlated ($\rho=.35$; $p<.01$). Also, the voice of others from the course correlated with the educational material voice ($\rho=.29$; $p<.05$). Through the ANOVA an impact of the course-situated chronotope on both the I-voice ($F(1)=8.49$; $p<.01$) and on the We-voice ($F(1)=8.78$; $p<.01$) emerged.

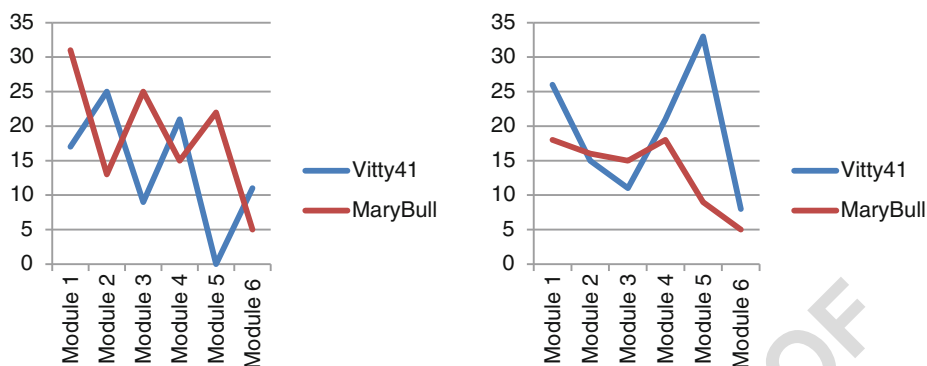
Indeed, modules 3, 4 and 5 had many significant Chi-square relations, linear correlations and important ANOVA results, proving that the participant had a dialogical trajectory even when her participation was lower.

During module 6 no significant Chi-square relations were found. However, several linear correlations appeared. In particular, the I-voice was significantly related to the other voices from the course ($\chi^2(2)=.72$; $p<.05$) and to both the course-situated chronotope ($\chi^2(2)=.72$; $p<.05$) and the outside chronotope ($\chi^2(2)=.95$; $p<.01$). Again, the I-voice was associated to the other voices from the course and it was in charge of describing both chronotopes. The We-voice and the voice of others from the course were also significantly related ($\chi^2(2)=.76$; $p<.05$) and, finally, the other voices from the course were associated to the outside-of-course chronotope ($\chi^2(2)=.66$; $p<.05$). The ANOVA revealed the impact of the course chronotope on the I-voice ($F(1)=7.41$; $p<.05$).

In short, it appears that, during her learning experience within this course, MaryBull was able to go through many changes. From an initial polyphony dominated by the I-voice to a polyphony composed of voices equally present; later, the I-voice again became prevalent without jeopardizing the other voices. Toward the end of the course, the polyphony changed again: all the voices lowered and some of them disappeared. Indeed, we managed to retrieve



Figs. 3 and 4 Comparing percentage distribution of participants' trajectories of I-voice and We-voice



Figs. 5 and 6 Comparing percentage distribution of participants' trajectories of the Other voices within the course and outside the course

a movement during which the prevalent I-voice left space to many other voices; a movement during which all the voices jointly stirred up, and a final movement toward an almost silent polyphony. Furthermore, the capability of the chronotope to influence the voices – which appeared in many modules – is very interesting.

Altogether, the many correlations found between the indicators prove the strong dialogicality featuring MaryBull's trajectory. In particular, during modules 4 and 5 the dialogical structure of her positioning expanded at its plateau and during the last module the frequencies lowered, though the dialogical structure was still maintained.

Comparing the two participants

The method we developed also allows us to compare participants. Once the percentages of distribution of the dialogical elements are calculated, the participants' trajectories can be contrasted and discussed. The following tables compare how the two students' elements evolve throughout the course.

These tables show how the two participants differ in terms of I- and We-voice. For Vitty41, the I-voice was very strong at half course and again at the end of the course, whereas MaryBull, though have started with a stronger I-voice, was able to lower it during the central modules and

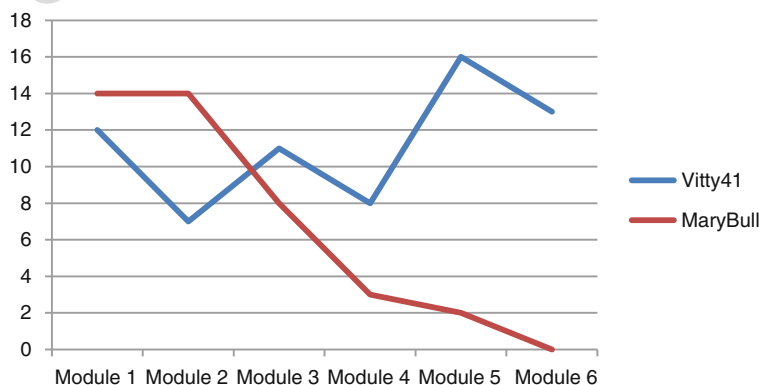


Fig. 7 Comparing participants' trajectories of the educational material voice

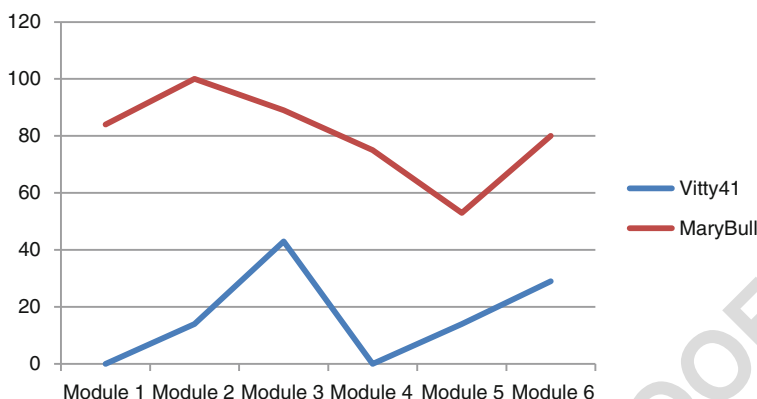


Fig. 8 Comparing participants' trajectories of the course chronotope

to improve it again at the end of the course. As for the We-voice, and with the only exception of module 2, this was clearly more relevant for MaryBull throughout the course Fig. 3.

The two trajectories of the other voices within the course were really erratic (Fig. 4); nevertheless it is possible to recognize a downward trend for both of them, with a reverse starting and ending point: from the highest percentage for MaryBull toward the lowest; from a relatively low percentage to a relatively high percentage for Vitty41. The outside course voices' trajectories also differ (Fig. 4): for Vitty41 other voices from outside the course were relevant in modules 1 and 5, whereas MaryBull maintained a rather stable percentage with a drop in the last two modules.

Figures 5, 6, 7 and 8 shows how the educational material was increasingly important for Vitty41 while, on the contrary, MaryBull had a reverse trajectory.

These two trajectories seem to have a similar trend, just with constant lower values for Vitty41. We did not compare the outside-of-course chronotope because Vitty41 never mentioned it and MaryBull's trend regarding this element can be retrieved from Fig. 2, where a rather constant low frequency is reported with an improvement during module 5.

The goal of these comparisons is neither to assess the students nor to rank them. We only want to prove that our method allowed us to compare individual trajectories in order to understand each of them better by looking at similarities and differences. Figuring out how to apply these comparisons to all the students of a course would make it possible to recognize common points showing crucial moments of the course and, at the same time, individual discrepancies revealing personal and idiosyncratic situations.

Conclusions

The main scope of this paper was to outline an innovative method capable of tracking and mapping identity trajectories within learning contexts. The concepts of polyphony and chronotopes were used as dialogical indicators of the identity trajectory. To test our method, we used the notes posted online by two university students during a blended course, designed to foster collaborative and constructive participation. The two students were selected because of their diversity in terms of quantity of participation and inclination toward technology. We expected that such diversity would allow us to highlight different aspects of their identity trajectories, even unexpected ones.

As Dreier (2003) stated, individuals follow unique “trajectories of participation” across contexts and time. Indeed, our two participants showed specific and peculiar paths and twists throughout the course and within each module composing the course. Our method allowed us to recognize crucial modules, relevant activities, and situations when the students changed their way of participating. Trajectories were different and unique for each of them. Both were inconstant; no substantial regularities could be found. Each student had a specific development, differing from module to module, probably responding to contextual elements and private situations. We consider our method capable of retrieving and tracking this uniqueness and of highlighting when changes occur. Of course, the sensitiveness of researchers and educators continues to be necessary to understand the reasons for each trajectory and for the specific developmental changes. Similarly, interventions based on the outputs of our method should be supplemented with more information about the participants and the course.

Of course, the method we propose still needs much improvement. More cases are needed to test its power and traditional courses – based on mere face-to-face interactions – could be studied to understand the specific effects of introducing dialogical digital environments on identity development. At the same time, we are convinced that this method has a great explanatory power regarding how students change during a course. Furthermore, the corpus of data can be expanded by also including discourse data collected before the course starts, and right after, and long after it ends. This way it should be possible to trace the perception students have of themselves as students and to see how this perception evolves and how stable these changes are. Therefore, we hope to see many applications of this method in order to improve its explanatory power and its capabilities of treating learning as a developing identity trajectory.

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