

LINES OF FLIGHT AND NOMADIC TRAJECTORIES: VISUALISING RHIZOMATIC LEARNING WITH CARTOGRAPHY

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ABSTRACT

Aim. This article presents the research on using cartography as a research method based on Gilles Deleuze and Félix Guattari's (2004) insights. The aim of the study – to unfold and visualise students' learning experiences in non-formal and informal learning contexts beyond the classroom.

Methods. Cartography and rhizoanalysis. Cartography is a method of mapping (Wilmott, 2020). In order to create rhizomatic maps we used Deleuze and Guattari (2004) theoretical insights. The rhizoanalysis (Masny, 2015) was carried out according to Deleuze and Guattari's (2004) rhizome principles: connectivity and heterogeneity multiplicity and rupture, cartography and decalomania. The rhizoanalysis simultaneously reveals Alecia Youngblood Jackson and Lisa Mazzei's (2012) process of "thinking with theory". Thirty-eight students from upper-grade classes participated in this research. Each student's learning path was depicted as their rhizomatic journeys, using various concepts such as nomads, lines of flight, becoming.

Results. The rhizoanalysis makes it possible to reveal students' rhizomatic learning experiences, areas of interest and learning styles. Such a map challenges an existing hierarchical framework and conveys how students' freely make connections through lines of flight and create their own learning paths.

Conclusions. This study demonstrates cartography as a useful methodology for visualising students' learning experiences. Also, this study is unique and distinctive because it reveals the nomadic trajectories of individual learners and offers a thorough investigation of their activity destinations. The researchers of this study advise that students' non-formal and informal learning experiences be included into their formal education by using nomadic pedagogy.

Keywords: cartography, mapping, students, learning experiences, Deleuze and Guattari

INTRODUCTION

Nowadays, in unpredictable and changing times, rhizomatic learning has received increasing attention in education. The notion of rhizomatic learning is based on Gilles Deleuze and Félix Guattari's (2004) concept of the rhizome, a root with no beginning and no end, and allows us to describe phenomena of complexity and non-linearity in the contemporary learning process. According to Dave Cormier (2008), the knowledge acquired through rhizomatic learning is easily expandable, flexible, responsive, and resilient like the rhizome root itself. Adrew Lian and Maria Victoria Pineda (2014) emphasise that rhizomatic learning evolves into a dynamic, open, and personal learning network that is created by the learners themselves and meets their authentic educational needs. Rhizomatic learning is described as eclectic learning that develops and manifests itself through various 'moving' concepts according to Deleuze and Guattari (2004). Concepts such as *lines of flight and deterritorialisation* demand special scholarly attention in educational research due to their profound educational implications. In the rhizome an interplay between lines of consistency and lines of flight represents struggles between stabilising and destabilising forces, A person or thinker, being a nomad, creates new spaces and realms of possibility by moving from one place to another through nomadic trajectories (Conley, 2010). On their journey to becoming – self-evolution – nomads are actively engaged in both physical and inner movement (Duoblienè, 2018). Physically, learners move beyond the traditional rigid hierarchical learning environments of classrooms and school territory and travel to deterritorialised spaces of informal learning, where they can learn freely in non-sedentary, non-fixed and non-settled places, such as museums, parks or other locations. Speaking about inner movements and journeys, through deterritorialised lines of flight, learners go through transformations in their thoughts and identities, transcending their former selves and evolving into someone or something else (the others of the self). Lines of flight represent the routes and pathways of transformations, which unfold realms of new thoughts and experiences. Ultimately, these lines of flight, according to Paul Patton (2010), mark the distinct creative expression of an assemblage, the specific way in which it can affect transformation in other assemblages. The lines of flight are movements of deterritorialisation and destratification (Deleuze & Guattari, 2004),

that change not only external territories of places and bodies but also inner landscapes of thoughts and identities.

Originating from the field of geography, cartography focuses on the creation of graphic representations of space through the use of maps, charts, and physical landscape plans. Cartography is understood as a specific mode and method of mapping (Wilmott, 2020). Recent advancements in technologies such as network technology, big data analysis, artificial intelligence, and multimedia visualisation have revolutionised the field of cartography. Digital cartography evolved alongside computer technology. With the help of several tools and services, technology has made the process of gathering spatial data more affordable and easier, and cartography is now accessible to the general public (Tavra & Škara, 2020). Cartography today is not just about depicting physical or static objects. In various disciplines it is used to reveal dynamic trajectories of movement and change, as well as experiences in non-linear, non-hierarchical, and unpredictable settings.

As a method, cartography aims to craft escapes from conventional, automated, or colonised viewpoints, challenging and destabilising the established norms in science research and education (Ribeiro & Costa, 2022). In the field of education, cartography conveys students learning experiences and educational trajectories, both in school and outside formal educational settings. Nowadays, learning experiences thrive in a variety of changing learning environments and life situations, when students learn beyond the classroom and curriculum in various non-formal and informal learning surroundings. The growing flows of information in the mass media and the expansion of virtual communities encourage and facilitate out-of-school learning, which is fuelled by learners' desire to explore other cultures and countries, to connect with like-minded people, to have fun, and to engage in self-education. Their learning can be expected to evolve into a rhizomatic endeavour, and cartography reveals insights by Deleuze "Deleuzian maps are always becoming as they 'uncover' the unconscious through cartographic performances" (Ulmer & Koro-Ljungbeg, 2015, p.139). Cartography becomes a method of grasping these unpredictable, multiplicative, and non-linear pathways and trajectories: "Every rhizome contains lines of segmentarity according to which it is stratified, territorialised, organised, signified, attributed, etc., as well as lines of deterritorialisation down which it constantly flees" (Deleuze & Guattari, 2004, p. 9).

In this article, we delve into exploration of learning journeys and the wandering paths of learners who are engaged in English language learning and broadening their linguistic and life horizons. We pose this research question: How can the nomadic and rhizomatic learning experiences of students in non-formal and informal learning contexts be mapped and depicted utilising Deleuze and Guattari's concepts of rhizome, deterritorialisation and becoming through a cartography approach? This question suggests an exploration of the potential of cartography to capture and visualise fluid and non-hierarchical learning processes and to delineate the multifaceted and complex nature of contemporary learning.

CARTOGRAPHY IN EDUCATION – A MULTIFACETED APPROACH TO RHIZOMATIC LEARNING

A number of studies engage in discussions of the distinctive qualities of cartography, in particular exploring the concept of rhizomatic cartography, which is elucidated in Deleuze and Guattari's (2004) work *Capitalism and Schizophrenia: A Thousand Plateaus*. Rhizomatic maps convey change and fluidity in places where rhizomatic features occur. "The variability, the polyvocality of directions, is an essential feature of smooth spaces of the rhizome type, and it alters their cartography." (p. 382). Cartography involves making a "map" of many kinds of information provided by a multiplicity of desiring agents not only in a variety of power-producing industries, but also in other disciplines (Lenz Taguchi & Palmer, 2014). From a research perspective, cartography is viewed as vacillating between interpretation and map-making. According to João Pedro Goe Lopes and Rubens Antônio Gurgel Vieira (2023), cartography is an exploratory process whereas a map is demarcated by lines that are discovered or invented through exploration. Cartography as a process is intensive and subject to change, with cartographers or mapmakers using a variety of techniques and tools to gather, process, and represent information. Similar to the rhizome, this concept reflects navigation through tangled and abandoned paths, sometimes following reversed routes.

Many researchers (Gurgel & Maknamara, 2022; Hernández-Hernández et al., 2018; Scherer & Grisci, 2022; Sletto et al., 2021; Lenz Taguchi & Palmer, 2014; Ulmer & Koro-Ljungberg, 2015; Waterhouse, 2011, etc.) have highlighted the capacity of cartography to represent not only physical spaces and objects, but also subjective dimensions of human experience, human emotions, travel impressions, art compositions, etc. Fernando Hernández-Hernández et al. (2018) describe cartography as a visual articulation that is structured using axes, linkages, key places (notions), locations, positions, and distances. It is a never-ending process in which the producer brings memories, experiences, desires, and imaginations rather than a final product.

Rhizomatic cartography helps to analyse significant life experiences of learners and to uncover non-hierarchical connections, appearing assemblages, changes and creation of becoming.

Referring to Deleuze and Guattari (2004) Bjørn Sletto et al. (2021) analyse indigenous cartography in which mapping becomes an imaginary unstructured and unstable tracing, and an open process, in which complex co-production of knowledge and new experiences emerge in storytelling-through-walking in indigenous landscapes and places with meaning. The authors describe how rhizomatic maps are viewed as unstable and unfinished and open to remaking and refolding, at the same time the participatory mapping implies negotiation and contestation. Laura Alves Scherer & Carmem Ligia Iochins Grisci (2022) introduce the concept of sentimental and psychosocial cartography, inspired by Deleuze and Guattari's (2004) concept

of the rhizome, to capture the complexity, interconnectedness and multiplicity of subjective experiences.

In education the rhizomatic cartography depicts the pathways and experiential trajectories of learners through analysing schoolgirls' subjectivity (Lenz Taguchi & Palmer, 2014), language learning acquisition (Waterhouse, 2011), curriculum analysis (Gurgel & Maknamara 2022), teacher education (Hernández-Hernández et al., 2018; Ulmer & Koro-Ljungberg, 2015), student physical education (Lopes & Gurgel Vieira, 2023), youth social education (Cole & Moustakim, 2022), early childhood (Roa-Trejo et al., 2023), and art (Lemieux et. al, 2020).

Hillevi Lenz Taguchi & Anna Palmer (2014) adopts a Deleuzio-Guattarian methodology to cartography alongside the concept of the Body without Organs to explore the complex and multifaceted production of subjectivity that extends physical embodiment. Subjectivities are seen not as static and fixed entities, but rather as evolving, transforming realities that emerge through a multiplicity of desires and interactions, manifesting processes of deterritorialisation that take the form of 'lines of flight'. Monica Waterhouse (2011) portrays cartographies as assemblages of diagrams, questions, poetry, and conceptual linkages that emerge from the data. In Waterhouse's study, each map emerged as the result of a rhizoanalytic event in which meaning and sense come to light. Each map was composed of data crafted through classroom vignettes, literary connections, philosophical connections and queries.

Evanilson Gurgel and Marlécio Maknamara (2022) describe cartography as a research strategy to delineate a new type of learning that allows us to challenge the discipline and control practices and hierarchical structures imposed by the state apparatus. The researchers present the story of a boy who runs home every Sunday from church school to watch episodes of his favourite television show. The boy engages into a curriculum of serialised stories, dreaming and 'traveling' to other worlds and realities. Such joyful and amusing learning experiences fuelled by the desires of learners alter and shatter the rigid, hierarchical, and molar lines of curriculum practices, by rupturing flexible and malleable lines of flight and escape that allow the transformation of the self and the development of new experiences that open up new territories of learning.

Jamine Ulmer and Mirka Koro-Ljungberg (2015) employing cartography as a means to visually encapsulate the writing process. Through a series of engagements with mapping and cartography, the authors developed methodological mappings of teacher career trajectories. They create situational maps, that, as described by Adele Clarke (2005, p. 30), act as "devices for handling multiplicity, heterogeneity, and messiness in ways that can travel maps allow unmapping and remapping", highlighting fluidity and adaptivity in the mapping process (as cited in Ulmer & Koro-Ljungberg, 2015, p. 138).

Hernández-Hernández et al. (2018) examine teachers' learning experiences through the prism of poststructuralism and nomadic thought. In this study, teachers

participate in workshops on generating visual cartographies both inside school and outside traditional classrooms. Teachers' cartographies become spaces of inquiry to chart their nomadic educational paths and trajectories and reveal the dynamic nature of learning and professional development.

Lopes and Gurgel Vieira's (2023) study of rhizomatic cartography within Physical Education discusses a rhizome that intertwines classes, activities, projects, students, teachers, spaces, learning and experiential trajectories. They distinguish between the hard or molar lines (rules, structures, a fixed curriculum and practices imposed by institutions in power), and the more flexible, malleable or molecular lines of segmentation and lines of flight which involve deterritorialisation and destabilisation of hard lines (rigid structures). These lines evolve into lines of desire, ushering in new inventions, informal activities, the creation of new paths and alternative routes. Teachers and students are involved in the mapping process, extending a plateau (the gym, the classroom, and other places) and deterritorialising class activities by engaging in new learning experience and body practices in physical education. Mapping shows new connections between dances, games, gymnastics and other sports activities in a non-hierarchical way.

The authors discuss the concept of Minor Physical Education which revolutionises the curriculum through its disruptive and 'violent' nature, creating the rhizome that opens new cracks for lines of flight, fostering the rise of desire-driven assemblages in classrooms, gyms, courts, neighbourhoods and alternative sites of free-form classes.

David Cole and Mohamed Moustakim (2022) introduce the concept of social cartography inspired by the ideas of Deleuze and Guattari (2004). The authors illustrate this concept by recounting the experiences of young people in Claymore District of Sydney who travelled in a mobile van equipped with high-tech hardware and software and had exciting and enjoyable learning experiences. The van provides an informal, innovative and personalised learning environment, free from the disciplinary regimes of school and the controlled curriculum. The authors describe social mapping as mobile project creates emerging assemblages of bodies, movements, on-board high-tech software, and interactions with the surrounding urban environment.

José J. Roa-Trejo et al. (2023) describe temporal assemblages of human and non-human actors in early childhood as processes of "becoming" and (de)(re) territorialisation. Pathways of lines of flight and flows of desire occur here. The assemblages that emerge in the classroom are made up of children, teachers, objects, bodies, sounds and movements.

Smith Lemieux et al. (2020) give examples of how students are engaged in territorialising their learning and living experiences through paintings, sketches, and other artistic depictions of the human body, a group of immigrants to Canada conveyed their ideas, feelings, and experiences as well as their physical travels in a literal and figurative (metaphorical) manner. The deterritorialisation and reterritorialisation processes were mirrored in the body maps created by the participants. In addition,

these maps illustrated a number of topics, such as healthcare, nostalgia for their native countries, war experiences and benefits of living in Canada.

The analysis of the aforementioned studies (Lopes & Gurgel Vieira, 2023; Cole & Moustakim, 2022; Scherer & Grisci, 2022; Lemieux et al., 2020; Waterhouse, 2011, etc.) shows that, in the field of education, cartography as a mapping process based on Deleuzian and Guattarian concepts such as rhizome, assemblages, lines of flight, becoming, etc. Territorialising-deteritorialising-reterritorialising allows to convey and invite new and emerging learning and teaching practices that create new student learning experiences, emotions and desires of students, shape new assemblages and evoke transformations and becomings. The mapping process illustrates non-hierarchical relationships and connections, while illuminating and challenging traditional educational practices embedded in power relations. The theoretical distinction provided by Deleuze and Guattari (2004) hard/molar lines, the malleable/molecular lines and lines of flight allow for the recognition of different modalities of reality within the rhizome, which includes spaces of stability that encompass traditional learning with rules and a fixed curriculum (hard/ molar lines), flexible realities of potential change (malleable or molecular lines) and lines of flights that convey deterritorialisation, change and transformation as new assemblages of learners, places, objects, learning activities, feelings and emotions are created, new paths and trajectories drawn, new becomings and transformations induced.

MATERIALS AND METHODS

The aim of the research – to unfold and visualise students' learning experiences in non-formal and informal learning contexts beyond the classroom. In our study, we employ cartography and develop maps, drawing on the ideas of Deleuze and Guattari (2004). According to James Corner (2011) mappings do not represent geographical ideas, but construct “planes of consistency” that provide analytical information while also enabling suggestive readings and projections. According to the author, these temporal, systemic networks can be distinguished from traditional cartographic concerns focused on static space. Rather than designing relatively closed systems of order, rhizomatic mappings offer an infinite series of connections, switches, relays, and circuits for activating both matter and information.

We use the rhizoanalysis to read and interpret cartographic maps. Diana Masny (2015) argues that rhizoanalysis in qualitative research develops new concepts in relation to data, emphasises experimentation, including new relationships and concept building, assemblage, power (stable and disruptive) and space (territorial and transformative, e.g., becoming). Masny (2015) also describes rhizoanalysis as a (non-)method, thus emphasising that rhizoanalysis cannot be done in one way. The movement of rhizomatic lines itself unfolds in a non-hierarchical way; one

element establishes a relationship with another element. Her successor, Waterhouse (2011) also presents rhizoanalysis as “a (non)method that views data as transgressive (exceeding representation), analysis as a process producing rhizomatic connections (immanence), and reporting as cartography (mapping different assemblages)” (p. ii). The rhizoanalysis connects with Alecia Youngblood Jackson and Lisa Mazzei’s (2012) “thinking with theory”, which seeks to identify the dominant theory within poststructuralism. Inspired by Deleuze and Guattari’s (2004) new conception of thinking, Alecia Youngblood Jackson and Lisa Mazzei (2022) provide a critical examination of the dogmatic approach of relying on what is already known and aiming to be guided by similarities and universals. Here, Deleuze and Guattari’s (2004) new image of thinking is characterised by the unexpected encounters, where openness to change and new ideas, creativity and experimentation are emphasised. This is obviously rhizomatic, creative, and divergent thinking. Our analysis of the maps seeks to establish connections with Deleuze and Guattari (2004) philosophical concepts, theoretical frameworks, and new ontologies. Youngblood Jackson and Mazzei (2022) assert that there is no single, rigid path for selecting post-theories; the process is determined by what books researchers read, how they collect interview data, what research notes they write, what news they read, and how they participate in social media and use other materials. “Thinking with theory” creates something new, a continuous, ongoing process of production and reproduction. The authors see the invention of new concepts, such as “thinking with theory”, – as part of “new” empirical qualitative research practices. “Thinking with theory” disrupts the conventional tendencies inherent in traditional qualitative research, presenting a distinct paradigm where the necessity for processes such as coding, sorting, combining, or modelling is no longer a prevailing requirement (Youngblood Jackson & Mazzei, 2012). In this article, “thinking with theory” elucidates how the poststructuralist philosophies of Deleuze and Guattari are interpreted in the educational process of reading and analysing rhizomatic maps of students’ English language learning. In this context, Deleuze and Guattari’s (2004) theory of assemblages comes to the fore within the realm of rhizoanalysis, where the latter are composed of multiple and heterogeneous elements of different types and form interconnections and assemblages. In these functioning assemblages, multiplicities increase, the relationships between the elements change, and the outline of these assemblages’ changes (Youngblood Jackson & Mazzei, 2012). Importantly, there is no predetermined or fixed relationship between the elements that comprise these assemblages.

In our study we apply Masny (2015) rhizoanalysis, based on Deleuze and Guattari’s (2004) rhizome principles. According to this methodology, the first and the second principles of connectivity and heterogeneity, in learning the rhizome can be connected to any other point and different human, non-human, and/or artificial elements. The third principle, multiplicity, consists of two or more combinations and is applied to learning skills in our study. The fourth principle, rupture, suggests

that the rhizome's flow can be broken, interrupted at any point, and restarted again from an old or new line, mirroring the nature of learning that can pause at certain points, continue for a while, or start again. So, the rhizome perseveres and permits the construction of its own map, as demonstrated by the fifth principle – cartography, which allows the creation of learning pathways. The principle of decalcomania represents students' learning as a repetitive stamp or copy, signifying the path taken and the instances in which learning occurs repeatedly. However, this principle does not always appear in rhizoanalysis.

According to Masny (2015), in rhizoanalysis, it is important to explore connections and transformations or becomings that are signified as lines of flight. This approach treats each element or relation) equally important because it is linked to other elements and relations. In this respect, Masny (2013) posits that rhizoanalysis is full of nomadic, anonymous, and other singularities as unique events and occurrences that have important consequences in the field of action.

RESULTS

Reading rhizomatic maps according to rhizoanalysis. This study involves 38 upper-grade secondary school students learning English as their first foreign language. Individual rhizomatic maps are crafted to uncover the features of their rhizomatic learning journeys. The process of creating these maps employs three software programs: *Excel*, *Pajek*, and *Inkscape*.

The rhizomatic map is created on the basis of the student's English language skills, incorporating themes and subthemes and identified segments of the text (for example, Figure 1). To investigate the functioning of the assemblages more effectively, the study focuses on multidimensional assemblages that combine two English language skills, including reading-listening, reading-speaking, reading-writing, writing-speaking, speaking-listening (shown in blue on the map). The yellow shape on the map designates the operating area of the assemblage (reading-listening assemblage in Figure 1). Nevertheless, assemblages do not occur consistently, so individual skills, such as reading, listening, writing, and speaking (also shown in blue in Figure 1) are linked to assemblages, with their relationship indicated by lines connecting circles of the same colour. In many cases, lines from an assemblage (e.g., reading-listening in Figure 1) link to a general activity (e.g., finding information on *YouTube* (*Info on YouTube*) in Figure 1), branching into more specific activities (e.g., *crafts*, *true crime cases* in Fig. 1). In the map rupture lines also appear. They are marked by a dotted line and show a gap between skills and activities (Figure 1, between computer games and the game *Fortnite*) and depict emerging changes and new order. Escape lines, coloured green in Figure 1, open new directions in learning, where the student engages in new, unusual activities. In this way, students not only

create assemblages of skills, but also, through the lines of flight (coloured in pink in Figure 1), create becomings and undergo transformations and identity changes.

The speaking-listening assemblage (Figure 1), created by the student creates through molecular lines, shows communication through travelling to different countries to interact with other people, and at the same time, through lines of flight, the becoming of a nomad is created.

I participated in the exchange programme, the Dutch came to us, we went to the Dutch; it was their initiative. When I left, there were so many Dutch people living with our family, so we agreed that we would not speak Lithuanian when she was near us, that we would only speak English <...>. (S.1)

This excerpt shows that the student creates assemblages with people, Dutch country, language. It is not easy to use English when travelling.

It's really scary sometimes when you go away, I feel Confident to talk etc., but when you go away it's a bit shy. But you always have to use English when you can't communicate in another language, I think it's really improving. I've travelled quite a lot in Europe, I've been to Prague, Amsterdam, Tartu. I've been to Rome; travelled around Latvia, Estonia. (S.1).

While travelling, the student gains more and more self-confidence, expands their horizons, becomes more determined to speak, and gets to know people from other cultures.

Here reading-listening assemblages immersing into listening to *TED Talks* with subtitles during museum visits and viewing virtual exhibitions, listening to and reading information on various portals and social networks. "Because I like embroidering, I usually watch 'Crafts' or something similar on Youtube." (S.1)—claims a student.

Writing-reading assemblages that the student creates through molecular lines are formed through interactions with peers from America and Lithuania, online shopping transactions, and involvement in computer gaming. The student's immersion in the game leads to becoming a player. Within this assemblage, a rupture line emerges: the gap between the writing-reading assemblage and the computer game *Fortnite*.

Now I started playing, and that's the game *Among Us* which became very popular. When I was younger, I used to play *Minecraft* then there was a time when I played *Fortnite*, but anyway, now *Among Us*, such a team game, is something I play in my spare minute. (S.1).

This rupture allows for a new order to emerge; the student has not played the game for some time and may be looking for new activities that interest her more.

The speaking-listening assemblage appears through molecular lines when travelling, singing English songs in a choir, travelling to project activities, or living with a family. The student has lived in America since she was in primary school, and her family is still in America, so she often travels to the country. In this way, she depicts

nomadic trajectories when she leaves Lithuania (settling down) and goes to America (looking for another territory to settle in).

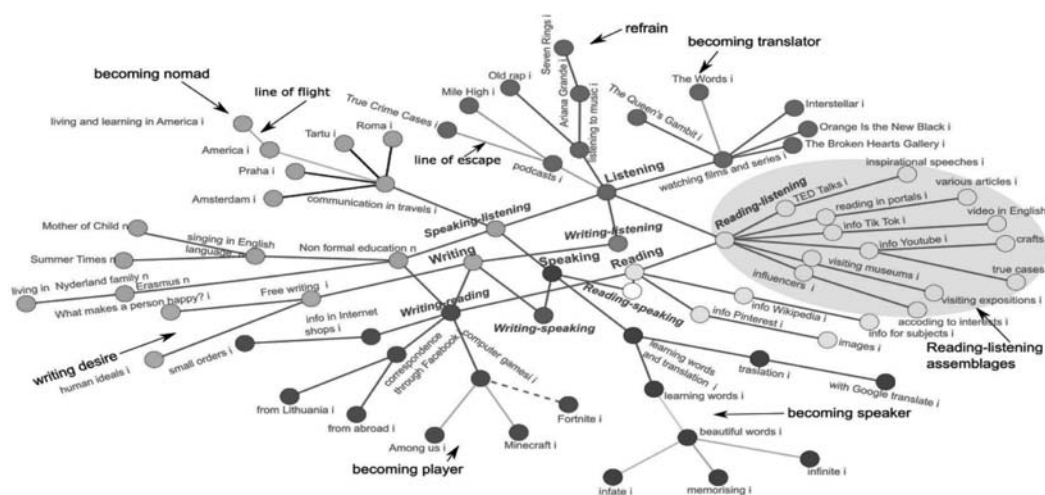
Moreover, speaking-listening assemblage occurs when she sings songs.

My hobby is singing. I've been singing English songs for a long time. Also, I have been skateboarding. I've been singing in a stage band, and we've been trying to do some Lithuanian songs as well - the folk songs - but if we're going to take the Pops, then all our songs at the moment are just *Summer Times*, *Mother of Child* in English, and we've been doing only that kind of thing for a long while (S1).

This excerpt shows that the student creates assemblages with English and Lithuanian songs, genres skateboard, and a stage band.

Figure 1

The Rhizomatic Learning of Student 1 in Non-Formal and Informal Learning Contexts



Note. Marking: Letter at the end of the keyword: i - informal learning context; n - non-formal learning context. Circle colour - different colours are used to highlight interacting skills and activities.

The yellowish shape indicates the area of the assemblage in which it operates.

Lines:

- | | | | |
|---------------------------|---|---------------------------|---|
| <p>—————</p> <p>—————</p> | <p>– a strong relationship between English language skills and activities.</p> <p>– an escape line (an escape from traditional English learning activities)</p> | <p>-----</p> <p>—————</p> | <p>– a rupture line (a broken link between English language skills and activities), allowing a new order to emerge.</p> <p>– line of flight (toward becoming Self-Other).</p> |
|---------------------------|---|---------------------------|---|

Source. Own research.

However, it is also possible to notice that individual skills, such as reading, listening, speaking, writing (Figure 1) also appear. The student reads information on Wikipedia and Pinterest. She also develops her listening skills by listening to Ariana Grande's album *Seven Rings* and old rap. In addition, listening skill she develops by watching series without subtitles, such as *The Queen's Gambit*, *The Words*, *Interstellar*.

This narrative aligns with Gilles Deleuze's (2012) concepts of difference and repetition ideas, as the student repeatedly watches the same film many times, and each repetition offers a distinct experience.

It was *Interstellar*, and the lead actor was my favourite Matthew David McConaughey. *Interstellar* I have watched *Interstellar* at least 10 times. It's probably one of my favourite films, maybe because it's about Space and so on. I'm interested in astronomy, but of course I watch a film just because it's interesting, and it's always new things, you learn something new, you notice something new, somehow there's something new anyway. (S.1)

The student through lines of flight creates becoming a translator, as she translates unknown words while watching the film. Only sometimes she switches on subtitles and translates unfamiliar phrases.

I used to watch the series *The Words* because it was so British English, there were words that I didn't really know, it happens, I go, I translate, and anyway I turn on the subtitles. It's not that I don't understand, I'd like to read, but look how pronounced, how words sound. There was a word where the character said "perfectly splendid", so I translated exactly that phrase. (S.1)

Moreover, through lines of flight she learns refined words such as: purpose, infinite, memorising, inflate. The student is passionate for writing – she writes essays on human ideals and happiness.

The rhizomatic map of Student 2 is shown in Figure 2. The speaking-reading assemblage (Figure 2) shows connections between actors (peers, photographers, people from other countries) and actants (social networks, photographic material, places).

Sometimes I correspond on social networks, and sometimes we just talk in English with some Lithuanians. When corresponding, sometimes I have to talk with foreigners; I maintain those contacts. Whom I met in America a couple of years ago, or I correspond with other photographers from other countries. Anyway, I'm interested in car photography, that's what I do, and probably my favourite photographer is Mark Scenemedia. He serves as *Top Gear* magazine's official photographer. (S.2)

As this narrative fragment shows, rhizomatic learning manifests itself with new ideas emerging through active discussion with other people moving into unexplored intellectual spheres.

The reading-listening assemblage discloses that the learner watches films according to his interests. The student also creates assemblages with TV programmes, film actors, machines, etc.

I have seen a lot of films, and maybe TV series, if you want to go that far. One film that I liked a lot was the recent *Ford versus Ferrari*, which is about racing, also based on a story. I have watched this film many times, and I have watched *Baby Driver* many times. This is the one I have watched the most. I like it because it is about cars, it is well filmed and directed, and the music is good, so every time I watch it, I discover something new, some details that I did not notice, maybe the first time I watched it, and that is the thing, that you look at it, and you are amazed at how much you missed the first time you saw it. There were a few new films from last year. I really liked *Joker* from the most recent ones. (S.2)

The narrative excerpt shows his keen interest in car photography, which influences his choices of films. Moreover, through the lines of flight he moves from becoming a viewer to becoming an investigator. One can also notice Gilles Deleuze's (1994) details of difference and repetition; he watches the same film several times. In addition, through the lines of flight the student creates becoming a photographer. The learner actively participates in car photography, capturing, and sharing photos on his own page on *Instagram*. His non-formal activity also is photography.

The speaking-listening assemblage shows how the learner wanders creating a nomadic trajectories and lines of flight in becoming a nomad. He travels to other European countries and lives in the USA. There he meets and communicates with the photographer Jeremmy Cliff.

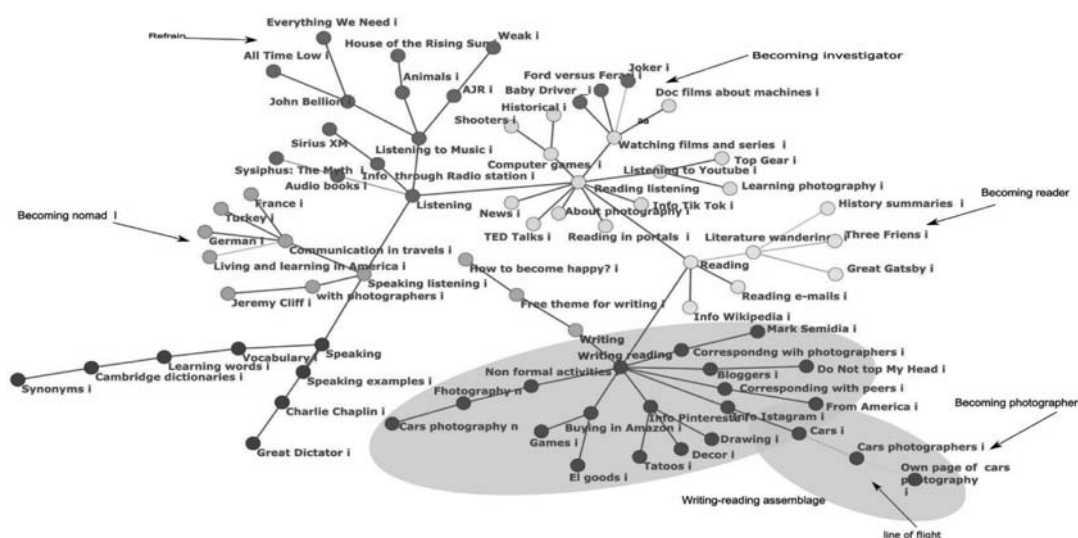
<...> or there's another photographer called Jeremy Cliff. I really liked him when he started taking pictures, and he lived in Chicago, where I lived for a year. I got to meet him and talk to him face-to-face, and it was very interesting. We talked about photography – his work and mine. (S.2)

As this narrative fragment shows, the “pleasure machine” is at work here, disclosing the learner's passion for photography. The student not only creates assemblages but also develops listening, reading, and speaking skills. To cultivate listening skills, the student enjoys listening to the music of different pop groups.

The learner prefers to listen to music through a refrain, which shows repetition of a part of the song. Herewith, he creates the line of escape and listens to the audio books like Albert Camus *The Myth of Sisyphus*, running away from traditional book reading.

Figure 2





The Rhizomatic Learning of Student 2 in Non-Formal and Informal Learning Contexts



Note. Marking: Letter at the end of the keyword: i - informal learning context; n - non-formal learning context. Circle colour - different colours are used to highlight interacting skills and activities.

The yellowish shape indicates the area of the assemblage in which it operates.

Lines:

| | |
|--|--|
|  — a strong relationship between English language skills and activities. |  — a rupture line (a broken link between English language skills and activities), allowing a new order to emerge. |
|  — an escape line (an escape from traditional English learning activities) |  — line of flight (toward becoming Self-Other). |

Source. Own research.

Developing his speaking, the learner tries to use synonyms, new words from a Cambridge dictionary. An example of his oratory is Charlie Chaplin's speech from the film *The Great Dictator*. The desire to write evolves through the creation of an essay *How to Be Happy*.

Also, the learner not only immerses in reading information from various Internet sources but also reads books such as Erich Maria Remarque's *Three Friends*, or Scott Fitzgerald's *The Great Gatsby*. In his opinion, it is better to create assemblages.

In America, when I was there, it was easier for me to read and listen at the same time, to read the same book. If you just listen, you can get lost, you can miss something, and when you just read, you can daydream, and when you listen and read, you don't wander off, you don't

get there, you don't daydream there, and that's the same way I do it sometimes in Lithuania, where, when it comes to the books that you have to read, you have to read them quicker, and it's faster. (S.2)

The blurring boundaries between individual language skills, and the assemblages created allow a number of skills to be developed at the same time in various ways.

Each student travels on nomadic pathways, creating multiple, non-linear, interconnected networks of objects, concepts, and relationships, according to the rhizoanalysis of the maps. The process of creating rhizomatic maps facilitates learners' experiences that shape their growth and identity. In education, rhizomatic maps provide a visualisation to explore the multiplicity and interconnectedness of learners' paths and experiences. Rhizomatic learning can mean a move away from traditional educational practices and norms towards more participatory and learner-centred approaches.

DISCUSSION AND CONCLUSION

Our study demonstrates that cartography is a useful methodology for visualising students' learning experiences in informal learning and out-of-school settings. In this research, all the principles of Deleuze and Guattari's (2004) rhizome: connectivity and heterogeneity, multiple and rupture, cartography and decalcomania have been harnessed to unveil the intricacies of rhizomatic learning of English among upper-grade secondary school students. The cartographic method has allowed for the delineation of nomadic trajectories of each student through Deleuze and Guattari (2004) rhizome "moving" concepts such as becoming, lines of flight, a nomad, etc. The students run away from a traditional English language class, and through deterritorialisation movements – lines of flight exploring nomadic space in informal learning contexts.

This research is consistent with Alexious Brailas' (2023) ideas on rhizomatic learning appearing between learners and the surrounding world. Students creating maps transmit rises and ruptures, ebbs and flow, relationships and connections, insights and plateaus of learners. Our study is similar to the Alexander Lenieeux et al. (2020) study, which describes nomadic paths of participants, who travel over plateaus and enrol in deterritorialisation, expressing their desires and enjoying their activities. Students build and explore their learning journey independently, seeking links and connections with peers, people, technologies, etc.

Our study reveals rhizomatic learning pathways and trajectories that emerge when students receive freedom to explore learning opportunities that suit their own interests and abilities. Our study encourages the use of nomadic pedagogy. For example, the study by Jon M. Stapleton and Jared O'Leary (2022) mentions nomadic pedagogy and demonstrates rhizomatic learning in communities. The authors use cartography in the classroom, having students and teachers make cartographic maps. Nomadic

pedagogy supports learners' interests and desires. Talking about assessment in nomadic education, it becomes important to analyse a learning journey in a qualitative way using various approaches and focus on the development of a coherent understanding of complex concepts such as assemblages, refrain, becoming, or solving arising issues. We suggest that teachers analyse rhizomatic maps and apply qualitative assessment. On the one hand, our study has some similarities with other researchers' studies (Brailas, 2023; Stapleton & O'Leary, 2022), but on the other hand, it is a unique study that shows the rhizomatic learning of English of each student in informal learning contexts.

The rhizoanalysis discloses the practical application Youngblood Jackson and Mazzei's (2012) "Thinking with Theory" poststructuralism theory was put to work. Our research has similarities with the Waterhouse (2011) study; the author has done rhizoanalysis based on Deleuze and Guattari (2004) insights. On the other hand, our research is similar because, as Masny (2015) says, there is no one way to do rhizoanalysis. As a result, our research demonstrates how a student's unique rhizomatic learning journey – which is formed by their interests, passions, and curiosities – is individualised and distinctive. Rhizomatic learning concepts derived from the rhizome, a philosophical notion proposed by Deleuze and Guattari (2004), are unique to each learner due to their customisation, independence, social interaction, flexibility, and continuous introspection. It rejects conventional linear learning models and adopts the rhizomatic learning tenets.

This study is unique and distinctive because it reveals the nomadic trajectories of individual learners and offers a thorough investigation of their activity destinations and the products offered by the industry when they are learning English in informal and non-formal contexts. We pay attention to "lines of flight" not only as deterritorialisation movements but also as creative leaps of individuals toward becoming – self-transformation. In addition, this research encourages English teachers to actively use theory as a tool to create new ideas, perspectives, and possibilities. It allows learners to create new unpredictable learning paths in various directions and teachers to move beyond passive application of theories and instead urges them to develop new insights, challenge assumptions, and generate creativity for understanding and solving real-world issues.

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