



CLASSROOM ASSEMBLAGE: THE VIBRANT SETTING OF THE SCHOOLING PROCESS

**SALA DE AULA ASSEMBLAGE:
O CENÁRIO VIBRANTE DO PROCESSO ESCOLAR**

**SALA DE AULA ENSEMBLAJE:
EL ESCENÁRIO VIBRANTE DE LO PROCESO DE ESCOLARIZACIÓN**

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RESUMO

Este artigo busca refletir sobre a complexidade do ambiente da sala de aula considerada como uma assemblage. A hipótese é que todos os componentes do conjunto são igualmente vitais, embora alguns vibrem mais que outros. A teoria de Vitalismo (Driesch, 1914) e o Materialismo Vital (Bennett, 2010a; b) são usados como ferramentas teóricas para análise. A Etnografia Assemblage (Youdell, 2015; Youdell & McGimpsey, 2015) é a metodologia de coleta de dados. Um estudo de caso múltiplo foi desenvolvido em três escolas no Reino Unido. Os resultados sugerem que professor e alunos são os componentes que mais influenciam na composição, decomposição e recomposição da sala de aula assemblage, orientando os fluxos de matéria-energia, uma vez que eles são agentes criadores e de mudança.

PALAVRAS-CHAVE: Vitalismo. Materialismo Vital. Teoria Assemblage. Etnografia Assemblage. Escolarização.

ABSTRACT

This paper's purpose is to reflect upon the complexity of the classroom environment regarded as an assemblage. The hypothesis is that all the components of the assemblage are equally vital, although some components vibrate more than others. The theory of vitalism of Driesch (1914) and the vital materialism of Bennett (2010a, 2010b) are used as the theoretical tools for analysis. Assemblage ethnography (Youdell, 2015; Youdell & McGimpsey, 2015) is the methodology of data collection. A multiple case study was developed in three different schools in the United Kingdom: one primary, one secondary and one post-secondary. The results suggest that the teacher and students are the components that most influence the classroom assemblage composition, decomposition and recomposition orienting the flows of matter-energy once they are change-creating agents.

KEYWORDS: Vitalism. Vital Materialism. Assemblage Theory. Assemblage Ethnography. Schooling.

RESUMEN

Este trabajo busca reflexionar sobre la complejidad del ambiente de aula considerada como un ensamblaje. La hipótesis es que todos los componentes del conjunto son igualmente vitales, aunque algunos son más vibrantes que otros. La Teoría del Vitalismo (Driesch, 1914) y del Materialismo Vital (Bennett, 2010a; b) son utilizados en el análisis. La Etnografía Ensamblaje (Youdell, 2015; Youdell & McGimpsey, 2015) es la metodología de recolección de datos. Un estudio de múltiples casos se desarrolló en tres escuelas en Reino Unido. Los resultados sugieren que el profesor y los estudiantes son los componentes que más influyen la composición, descomposición y recomposición del aula, orientando los flujos de materia y energía una vez que son agentes cambiantes y creadores.

PALABRAS CLAVE: Vitalismo. Materialismo Vital. Teoría Ensamblaje. Etnografía Ensamblaje. Escolarización.

CHEMISTRY

“It was the second time I was observing that Chemistry teacher and I had been following the Year 12ⁱ timetable that day. Some students had already got used to my going where they were, so they usually helped me move around the school. I was there to observe the uses of technology in education for my main research project and both the teacher and students were aware of that.

The lesson took place in one of the Chemistry labs of a grammar school for boys. There were eighteen boys in the group, of different ethnic heritages. The lesson was on Enthalpy. The projector was on, with a slide titled ‘AS Energetics’ ready to be used.

Before Sir started, Tomas, a boy who I noticed was very critical in lessons, asked why they were going to start on that content, since they were supposed to be doing it the following year. Sir said that it was a linear course: a two year curriculum which would be split across Years 12 and 13, because the structure of the A-level course had just changed. Tomas accepted the explanation and the teacher proceeded.

Sir said that he would start by explaining some equations; for each equation the students got right in the exams, they would get one mark. As they would not be given any equations during the exam, they needed to know them all by heart.

Sir explained the concept of enthalpy using some graphs and drawings in the slides. After each graph and equation, Sir emphasised how they would be assessed. While he was talking, his laptop went onto stand-by mode. Quickly, Sir pressed his finger on the touchpad of his laptop and the slide returned. As he started the explanation again, the slides disappeared. Again, it was the laptop sleeping. Sir frowned and pressed his finger in a more aggressive way, losing his temper. It happened three times. Then, Sir froze the projection and asked the students to copy the graphs.

While the boys were copying, they were also talking, probably about something other than enthalpy. They were smiling, poking each other, as if they were sharing something the teacher was not supposed to know, or was not supposed to mind.

Sir interrupted: ‘Who wants to explain each equation and what it represents?’ One student did. The teacher did not interrupt, however, the laptop did: it went onto stand-by mode again. Sir did not see it and one student pointed it out to him. Sir poked the computer and the slides reappeared. ‘Are you happy?’ he asked the students. I am not sure if he was referring to the slides back in the projection or to the explanation of the equation the student had provided.

For each interpretation of the equations the student provided, the teacher had to ‘wake up the computer’. The teacher seemed to be annoyed by it, based on the faces he made. Some laughs emerged from around the room.

The teacher said he would move on to the Born-Haber cycle. The students and I watched the teacher wake the laptop up again - like an assistant getting bored by the TV host’s performance - and access another slide from his cloud. Everything the teacher did was being projected. I was able to see how organised Sir was and how many different slides he had for the AS energetics topic. He opened the file and quickly flicked through it. He explained that they would just need some information from that file. He found the slide he wanted and asked the students to copy the information. Sir justified this instruction by saying, ‘I have a feeling it will be on the exam this year’. However, he continued: ‘You should be aware that, the information you are copying is according to the International Council of Chemical Associations, but on the exams you are supposed to use the ones you have in your books’. One student got confused and asked why. Faster than ever, Tomas answered for the teacher: ‘If you want to know the real thing, you look in your notes, if you want to pass the exam, use the wrong information from the book’. The teacher smiled. The students sighed. End of lesson.”

1 INTRODUCTION

This account happened during the first term of the 2015-2016 school year in a British post-secondary school. It was chosen to illustrate an ordinary day of the Advanced level course (A-level), which is equivalent to the Brazilian “Ensino Médio”. But what is an ordinary lesson supposed to be? Is it a moment in the timetable in which students and teacher are in a specific place in the school? Is it a practice of talking and writing about specific contents according to the official curriculum? If this lesson is ordinary, there are others which are not; why? These were some of the questions raised while the account was being selected.

The intention with this account was to have a starting point for investigating the composition of the classroom environment. Some recognisable elements were identified: the teacher, the students, a subject, the teaching and learning practice. Apart from the differences in the system, culture and history, teaching and learning tools and techniques are similar to any other school that is preparing students for university. The fact that it happened in a school “for boys” may raise questions about gender issues and their influence in the schooling process. It could be regarded as the first problematic point to be discussed. Although the purpose of this paper is to reflect upon the complexity of the classroom setting in the schooling process and gender is a part of it, there is not enough space to deal with these issues in detail or attribute the importance they deserve.

The focus of this study is to reflect upon what is regarded as ordinary in a classroom environment and show how complex it is. It is an environment in which subjectivities are constructed, discourses circulate, policy making happens, money flows. These elements are present in the classroom and what happens is oriented by these elements. However, some elements seemed to have a stronger influence on what happens in this setting, no matter whether they are human or not. All these elements needed to be considered while investigating the classroom.

In order to regard the classroom setting as manifold and complex, it is considered as an assemblage. Based on the work of Gilles Deleuze and Felix Guattari, DeLanda (2006, pp. 05, 06) explained the meaning of assemblage:

[...] assemblages, being wholes whose properties emerge from the interactions between parts, can be used to model any of these intermediate entities: interpersonal networks and institutional organizations are assemblages of people; social justice movements are assemblages of several organizations; cities are assemblages of people, networks, organizations, as well as of a variety of infrastructural components, from buildings and streets to conduits for matter and energy flows; nation-states are assemblages of cities, the geographical regions organized by cities, and the provinces that several such regions form [...]

An assemblage is a whole constituted by individual parts. These parts are independent units which are plugged into other units composing a cohesive whole. These components establish multiple relations with each other and this characterises the functionality of the assemblage. The classroom setting regarded as an assemblage allows the identification of elements that would not be taken into account together, at the same time: teacher, student, books, contents, practices, discourses, curriculum, policy, technology, food, furniture and many others. Based on the account provided, not only would the teacher and the students be analysed according to the teaching and learning process: teaching, learning, the material used, the content taught, the actions of teachers and students, the influence of the cloud, his “sleepy” laptop, the International Council of Chemical Associations (ICCA). The classroom as an assemblage would also allow the researcher to reflect upon each component individually, the encounters of these components, what resulted from these encounters, the actions of these components or the actions taken upon them, and the consequences of these actions for the milieu observed.

Assemblage theory provided the theoretical tools to trouble the classroom discourse that states that any lesson planned is going to result in effective teaching and learning processes, if some specific steps and actions are taken. As the example provided in the account, a lesson is more than content to be taught by a teacher. It is more than content to be learnt by a student, who is supposed to perform some tasks and, as a consequence, succeed in national exams.

The purpose of this paper is to trouble the straightforward notion of the classroom environment. In order to do that, an ethnographic account has been given to situate the reader in the context discussed. In the first section of the paper, the conceptual framework is provided, in which the theory of vitalism and vital materialism are explained. Then assemblage ethnography is justified as the method of data collection, influencing the process of analysis. In the results section, the composition of the classroom assemblage is provided, discussing each component, their actions and the implications of these actions for the composition, decomposition and re-composition of the assemblage. The last section discusses the implications of this study and possible insights into how the classroom assemblage reflects the schooling process.

2 CONCEPTUAL FRAMEWORK

Vitalism and Vital Materialism

The theory of vitalism was advocated differently by vitalists. The vitalists of the 20th century called themselves critical or modern vitalists because they distinguished themselves from the “naïve” ones, not believing in a spiritual “force” or “soul”, immune to experimental inquiry. They also opposed the mechanistic and deterministic model of nature, considering contingency as part of living in nature (Bennett, 2010a). The ideas of Hans Driesch grounded the principles of what Jane Bennett called “vital materialism” (Bennett, 2010a; b). Different from Driesch (1914), whose focus was only to investigate living things as part of organisms

in nature, Bennett (2010a; b) focused on the property of things in having energy as humans do. For her, things would have the same capacity to act as humans, resulting in a thing-power which leads to the construction of their own trajectories of movements and flows in the assemblage. But before describing what Bennett (2010a; b) claimed, Driesch's ideas and their relevance will be discussed.

Driesch (1914) shared the same manifold vision of assemblage theory: that reality is formed by wholes, which function as systems. For him, these systems are organisms formed by equally energetic components. Driesch (1914) believed that each component plays a specific role in a system, reinforcing their functions, contributing to the cohesion of the whole as such.

The energy of the components may vary. This variation may affect the actions that might happen within the assemblage. Initially, as assemblages are equally energetic, they may be considered as homogeneous, because there is an equal distribution of possibilities among components. However, Driesch (1914) said that the intensity of the flow of energy might change at some point, resulting in some components becoming more energetic than others. It might lead to the reconfiguration of the assemblage. This reconfiguration does not mean the destruction of the system, but its decomposition and recomposition that might imply a change in the structure and the redistribution of energy. This change is independent of the assemblage and Driesch (1914) attributed it to two things: the process of becoming and the action of entelechy.

For Driesch (1914), becoming is a natural process, in which components of the assemblage will face endurance in nature at some point and the process may result in some level of change. This change can affect one or more units, the relationship among units, or the entire assemblage. As a causal process, it is possible to establish rational connections among the changes that happen to the components and to the assemblage as a whole.

Becoming as a process implies an immediate experience, in which the actual context plays the most important part. It opens up possibilities at that moment because of the encounters of the components of the whole and their relations. Those possibilities are unique for that particular assemblage.

Driesch (1914) identified four types of becoming: a) cause and consequence if components are in the same context; b) thing-creating agents may increase the number of components; c) change-creating agents may change the assemblage without a cause; d) the number of relations between components may increase. Driesch (1914) did not explain if or how these types of becomings are related to each other. He did not discuss the entanglement of categories either. But these possibilities will be explored in the discussion section.

The other element that leads a system to change is entelechy. Entelechy is a non-energetic, non-material and non-spatial agent, which acts "into" space. It has the capacity to make a possibility become reality, suspending all other possibilities of the assemblage from happening (Driesch, 1914). By possibility, he meant actions that may happen regarding the

unit of the components and their functions in the assemblage. As the assemblage is manifold, possibilities are manifold as well, resulting in the increase of its complexity.

The action of entelechy depends on preformed material conditions: specific components are necessary, united in an assemblage with specific functions in a given moment for entelechy to emerge. For Driesch (1914), entelechy is not to be identified but its actions are to be pinpointed, resulting in the process of becoming. Entelechy is not the process of becoming, but becoming is the result of the action of entelechy.

Although entelechy is regarded as the actant responsible for the composition of multiple flows of energy, Driesch (1914) claimed that by the fact that humans are historical agents, their actions will be influenced by morality and creativity. These human attributes may increase or decrease their capacity to act. Animals and things do not have these attributes and will not be influenced by them.

Bennett (2010a; b) grounded her ideas on Driesch (1914). Despite the fact that she used the concept of entelechy, she did not consider only living beings as actants in the world. She advocated that both humans and nonhumans have the capacity to act because they both have vitality. She shared the monist view of Driesch (1914) as she believed that everything is reduced to a “simple substrate”: all the elements in nature are made from the same substance, with no difference between human and nonhuman, as everything is matter. As a consequence, all the material components of the assemblage have a vital force. However, some elements are more vibrant than others. All the components have the capacity to vibrate, but due to the flow of energy, becoming and the action of entelechy, some seem to be more “alive” due to the intensity of their vibration.

From a monist perspective, Bennett (2010a; b) proposed that vitality is not an attribute of matter or energy, but it is immanent in matter-energy components in the assemblage. Energy and matter would be two properties of the same element that all the components are made of. Bennett (2010a) believes that entelechy is the actant that represents this vitalityⁱⁱ. It is what animates and makes the impetus of matter-energy components emerge. It is the causal agent that breaks the harmony in assemblages, composing, decomposing and recomposing them. Entelechy is not only a reflex, an instinct or a response to stimuli, but also a generative power to produce, organise, and enliven matter in pulses of energy.

Despite the opening of possibilities, Bennett (2010a) regarded entelechy as less free, not having a sparking and innovating capacity. For her, the agency of entelechy is too self-contained. The limitation of entelechy is related to the nature of components and the composition of the assemblage, not resulting in something totally new, but there is a degree of expectancy in relation to what is possible inside that whole. For example, in a classroom assemblage, in which the roles of components seem to be defined and predictable, entelechy would not act in a way to totally decompose the assemblage, but different things would have the possibility of happening and different components could be added to it.

On the other hand, entelechy illustrates the pulsing of the assemblage as a circuit of

intensities: the dimension of how possibilities can emerge from all components, leading to the assemblage disarranging and rearranging in a different composition from what it was. This pulsing brings forth the idea of a dynamic, complex whole that can be disarranged at any moment and rearranged, due to the flows of energy it has.

Regarding the components of the classroom assemblage as vibrant matter-energy actants is a useful way to interpret and understand these different possibilities of becomings in the classroom setting. However, in order to develop a study based on this theoretical framework, it was necessary to have a research design, approach and method that was also based on the same principles.

3 RESEARCH DESIGN AND METHODOLOGY

Assemblage Ethnography

This study is part of a broader piece of research regarding the use of Information and Communication Technology in education. It was composed of three case studies, in which one primary school, one secondary school and one Sixth Form were observed during a school year. The main purpose was to identify what ICT meant in the schooling process, and the types of flows of matter-energy in the assemblage, resulting in its decomposition and recomposition. The research also discussed the implications of these processes for schooling.

Vitalism, vital materialism and assemblage theory were shown to be the appropriate onto-epistemological perspectives that provided the rationale of why technology was as important as humans in the schooling process. It also opened up the possibility of troubling the role of policy making, Continuing Professional Courses (CPD)ⁱⁱⁱ, tools, curriculum, furniture, and other elements in the schooling process. However, it was necessary to find a way to approach the field and collect data reflecting all these features.

Assemblage ethnography (Youdell, 2015; Youdell and McGimpsey, 2015) is a research approach grounded on assemblage theory. It considers economic, structural, spatial, temporal, representational, discursive, relational, subjective and affective relations as components of the assemblage (Youdell & McGimpsey, 2015). It combines ethnographic principles to “observe” the manifoldness of reality: human and nonhuman elements acting, reacting and interacting with each other. The focus is the actions and interconnectedness of feelings, everyday practices, pedagogies, subjects, money, political orientations, media, policy, institutional arrangement and informal knowledges (Youdell, 2015).

Different types of observations in the assemblage were possible: the classroom, the human components, the curriculum, social media interactions, conferences, traditional media news. Collecting data in a manifold environment demanded multiple strategies and for it the researcher had to adapt the strategy of data collection according to the composition of the assemblage. The strategies were: describing the field in a “field work diary” digital file, reflecting on the field in a “reflective diary”, interviewing the human components, analysing the policy documents related to the field, analysing the news related to education and tracking social media interactions and posts via the use of hashtags.

The data collected were anonymised before analysis. Human components had already given written consent and all names were changed to protect identities. Data were inserted in NVivo, coded and some themes and subthemes were identified.

The criteria of selection of the account were: it should represent an ordinary lesson; the subject taught should be recognisable by a Brazilian audience and the practice of teachers and students in the lesson should make sense for this audience. Chemistry is a mandatory subject in Brazil and the need to succeed in the assessment is a part of the wider worry over succeeding in Brazilian university exams, known as “vestibulares” or the National Exam of Post-Secondary Education (ENEM).

The steps taken in the analysis of this account were: the identification of the components of the assemblage; their role; the levels of vitality these components had in relation to others; the effect these different levels of vitality had, leading to decomposition and recomposition of the system; identification of the action of entelechy and the processes of becoming present in the account. These elements are presented in the next section and they will be discussed in the last section of this paper, providing some elements to reflect on the schooling process.

4 RESULTS: THE COMPOSITION OF THE CLASSROOM ASSEMBLAGE

Components and their roles in the classroom assemblage

The first step in discussing the classroom assemblage is the identification of its components (see Table 1). These elements composed this specific setting, that day, at that school. They might differ when Enthalpy taught again. However, it does not diminish the relevance of the insights into the daily practices of other schools, not only in the United Kingdom but also in other places.

TABLE 1 - The components of the classroom assemblage and their actions

Components	Actions
the teacher	talked about the content of the lesson, changed/searched the slides, accessed the cloud, indicated which content and how they would be marked
the subject, Chemistry	guided what should be taught and how teachers and students were arranged in that setting
the students	copied, talked (about the content of the lesson, about something else)
the researcher^{iv}	observed what was happening, took notes
the content, Enthalpy	oriented the content to be talked about by the teacher
the AS unit, Energetics	
the Born-Haber cycle	
the projector	displayed the information that the teacher talked about
the slides	organised the order of the information the teacher was going to talk about and how it was displayed
Tomas	performed the same actions of the other students and also asked and answered questions for the teacher and for the others
the A-levels	guided what and how students were supposed to know and learn
the exams	
the marks	
equations	illustrated different ways to present the content
the graphs and drawing	
the teacher's laptop	stored, accessed and displayed the content the teacher talked about and slept during the explanation (stand-by mode)
the cloud	stored and made accessible the teacher's files
the International Council of Chemical Association	recognised and indicated the appropriate Chemistry information in relation to what was in Chemistry books and exams
the one student	performed the same actions of the other students and also asked the teacher a question

These components were listed according to the actions performed in the account. What characterised them as components and not a pencil, for example, was the fact that they were active in the assemblage in a way they could be noticed by the researcher. Some of them were more active than others or were acted upon. These components acted that way and not in a different one due to the composition of the assemblage and to the setting in which they were.

Because of the characteristic of the assemblage, some components were expected to act in specific ways: the teacher to teach, students to learn and technology to work. From a flat perspective, it seemed teaching and learning occurred because talking about some content and copying it are practices recognised as part of the schooling process. Probably the teacher and the students would assume it happened because they were doing what they believed they were supposed to do. But to what extent are these actions really effective?

On the other side, two components seemed to be inappropriate for the composition of the assemblage: the ICCA and the laptop. Apparently there was no need for this institution to be mentioned and be part of the assemblage. Why was it there? What was its role? What was its action? The ICCA seemed to be out of place but its presence and action affected the assemblage. The laptop was also another component that seemed not to be working well: it was not behaving properly, not showing what it was meant to. As if in response to the boringness and monotony of the classroom, it kept sleeping, signalling something was wrong. The components' actions will be discussed in the next section.

Levels of vitality and their effects: entelechy and becoming

All the components were equally energetic because they were vibrant matter-energy things. However, what made one component differ from the other was the level of vitality they had, due to the influence of entelechy, resulting in different actions being performed.

The classroom setting was not a homogeneous assemblage as a starting point, as Driesch (1914) argued. Although all the components were equally vital, some were more vibrant than others, taking the lead in the actions that occurred. The teacher was one of these components. He acted most of the time, by talking. His talk was grounded on the A-level structure and the AS Energetics content, which increased the level of vibration of his actions. Other elements acted upon the teacher and contributed to the increase in his vitality: the exams and the marks that would be attributed to each content that was answered correctly in the paper. The vibration of these elements was so strong and acted upon the teacher in such a way that the teacher said "he had a feeling" that the Born-Haber cycle would be in the next exam.

The teacher, as a change-creating agent, organised the way the lesson was composed, being also responsible for the arrangement of the classroom assemblage. He planned in advance not only what he would do, but also how other components would behave: his talk, the use of equations, graphs and drawings, the slides, the use of his laptop and the projector. He also planned what the students would do: copy and explain some content.

However, his plan was interrupted by four things and their actions: Tomas, the laptop, the one student and the ICCA. These components interrupted the flow of actions from the teacher that was shaping the composition of the classroom assemblage. Except for the laptop and for the first action of Tomas, the other components' actions were interconnected and helped to decompose and recompose the assemblage.

Tomas's first action threatened the composition of the assemblage. As a change-creating agent and due to entelechy, he was vibratory in such a way that his question opened up the possibility of the assemblage decomposing. His question at the beginning of the lesson put that arrangement into doubt. But as Bennett (2010a) argued, the action of entelechy is self-contained and it was not enough to totally decompose the teacher's plan and to become something else. The classroom/lesson status was reassured by the teacher, justifying the

reason why he changed the order of contents to be studied. The teacher's vibration under the influence of entelechy was stronger because it was reinforced by other components and their entelechy, vibrating to the same purpose. But another question was raised: "What was his purpose?"

The laptop was not a threat as Tomas was, but it was also a change-creating agent. It was more a badly behaved component, not acting properly. Entelechy again was present, indicating that other actions were possible. The laptop was supposed to act in a certain way and it did, partially. The way the laptop was set up made it go into stand-by mode. It did not deviate nor interrupt the teacher's plan, but it disrupted with such vibration that it made the teacher annoyed. The laptop was more a reminder to the components, especially for the teacher, that any plan might be disrupted or interrupted at any time for any reason, unexpectedly. There was no guarantee in the plan made by the teacher that it was surely going to happen, no matter how rigorous one's plan was.

Tomas, the one student and the ICCA acted together in a sequence of actions that made the teacher react. When the one student did not understand the purpose of the teacher mentioning the ICCA, it opened up the possibility of decomposing the assemblage. There were two contradictory, valid pieces of information: the one from the ICCA and the one provided by the book used. This contradiction made the student confused and also invalidated the teacher's plan. But why was the teacher decomposing the assemblage he had arranged?

Tomas, as a student who had the identity of being critical, vibrated in the assemblage more than the other students. As the one who questioned the reason why that composition was settled, he was also allowed to conclude the undercover reason. Under the influence of entelechy, the teacher, the ICCA and the one student, Tomas recomposed the assemblage that was decomposing, justifying the reason why they were there. This reason is going to be troubled in the next section.

5 DISCUSSION: THE SCHOOLING PROCESS

Why would a teacher plan a lesson, use his time to gather information, prepare slides, think about different questions to ask students? In a straightforward answer: to teach some content. But what was he teaching, by choosing such material, content, practice and technique? During the entire lesson, the teacher was trying to tell the students the content he thought would be in the A-level exam. As the teacher "had a feeling" about this factual content, they had to learn a list of equations and their representations and know them "by heart".

This kind of argument was witnessed in different lessons and subjects during the field work: a teacher argued that specific content would be in the exams and the students were supposed to "know" it. By knowing, it meant memorising what those equations were and their definitions, as if the students were being asked to fill in a dictionary entry. These entries would be based on the "marking scheme"^{iv} of the examining boards. Based on the teacher's

lesson, those equations represented the content, Enthalpy. There was no contextualisation or everyday use of that knowledge. If there was, the teacher did not mention it. Why? Were students not supposed to learn the applicability of content to practical situations in real life?

Teaching in this setting was the act of the teacher talking about which content would be in the national exams. Learning was the act of the students memorising how such content would be assessed in the exams: simple and straightforward. This was the reason why the teacher planned the lesson and arranged the components that way. The matter-energy flow was arranged to accomplish that. It reflected the purpose of the schooling process.

However, as a change-creating agent, the teacher and entelechy had the possibility of decomposing the classroom assemblage, evidencing the limited purpose of the schooling process: to pass exams. It happened twice. The first time was when Tomas asked why the teacher had changed the order of the content. It was an indication that something was “wrong”, “out of order” in relation to what was supposed to happen. It was an act of disagreement over what was regarded as appropriate by the book used in class. Indirectly, the teacher was putting into question the order of the content proposed by the publisher, which in fact is one of the examining boards, the organisations that set national exams in the UK.

The second was when the teacher mentioned the ICCA by disagreeing with the content of the book. The ICCA is the organisation that determines what is appropriate for the field of Chemistry and the knowledge necessary for practical and real-life settings. When the teacher mentioned the ICCA, he troubled the content provided by the examining boards and acknowledged this by implying the book was wrong.

This fact led one student who was “not critical” to get confused about what was happening. Why were they learning something that was not accredited by the respected organisation? Tomas was the component who put the pieces together and said what the teacher wanted to say: there were two types of knowledge, the one students need in order to pass exams and the one people need in order to deal with Chemistry from the ICCA.

The existence of these two types of knowledge presented in this classroom assemblage raised the question whether the content taught in contemporary schools is appropriate and valid to be used in different contexts. According to the organisation that represents the experts of the field of Chemistry, it is not. It is not possible to infer that all the content of all subjects at school are not appropriate, but it raises the doubt about their validity, regarding contexts other than passing exams and the purpose of the exam itself. To what extent is passing a national exam valid if the content upon which it is based on is not useful in practical contexts? What is the schooling process for? Is it to pass exams or to learn something for life?

6 CONCLUSION

The purpose of this paper was to discuss the classroom assemblage by identifying its components, their actions and how they influenced the composition, decomposition and recomposition of the classroom setting. It concludes that the classroom assemblage is manifold and complex. By raising more questions about the purpose of the arrangement and actions in one classroom assemblage, it reflects the manifoldness and complexity of the schooling process as well.

This process is not based on straightforward actions and relations among elements. It is composed of independent vibrant matter-energy agents which have the capacity to alter the classroom assemblage's composition. The problem of the post-secondary education schooling process also emerges: being based on the passing or failure of exams, even if these exams might be grounded on information that is not useful in practical settings out of school.

The teacher and the student, as change-creating agents under the action of entelechy, vibrated in such a way that questioned the classroom arrangement, opening up possibilities of including and excluding what they might regard as appropriate to the schooling process. However, as entelechy is a limited agent, it is not possible to totally decompose the classroom assemblage, once it has been resettled, by the same components that questioned its arrangement.

The query about the validity of the schooling process could not be identified in all classroom assemblages. But the fact that it was witnessed in what was supposed to be an ordinary lesson evidences that this issue was part of the composition of one classroom assemblage and may be a part of others. It depends only on the matter-energy flow becoming evident, because the questions of what the purpose of teaching and learning are, are already part of it. Human components are just becoming aware of the answers to these questions due to the orientations of matter-energy flows and they are acting upon it.

Further research should focus on different settings in which the schooling process takes place. The identification of the components of other classroom assemblages, their forces and the flows emergent from these encounters would bring forth more information about this manifoldness and its complexity. It would also be necessary to focus on the discourses implied in these settings, the subjectification process of human/inhuman/nonhuman components and the economic flows, in order to build a more complete picture of the composition of the schooling process.

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ⁱ Year 12 in the United Kingdom is the first grade of post-secondary education, something similar to the first year of Ensino Médio in terms of age. However, the schooling process and structure are different. Source: <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/219167/v01-2012ukes.pdf> Retrieved: 02/05/2016.

ⁱⁱ Bennett (2010a; b) also works with and discusses the concept of *élan vital* from Henri Bergson, which she considers similar to *entelechy*.

ⁱⁱⁱ “Cursos de capacitação”

^{iv} It is impossible to not regard the presence of the researcher and how she was plugged into the assemblage. Not acknowledging this presence would neglect the principles of assemblage theory.

^v The marking scheme is a system for awarding points for correct answers in an examination. It would be something like the “gabaritos”, in which there is the correct answer and the score related to that answer.

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