



Professional Identity of Preservice Mathematics Teachers: aspects of the self-understanding mobilized in the *Vaivém*

Identidade Profissional de futuros professores de Matemática: aspectos do autoconhecimento mobilizados no *Vaivém*

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Abstract

The purpose of this article is to analyse aspects of self-knowledge mobilised by preservice mathematics teachers in the *vaivém* regarding the movement of constitution of their Professional Identity (PI). *Vaivém* is a tool of written communication between the teacher supervisor and the teacher in training. This is qualitative research of an interpretative nature, focused on the *vaivéns* produced by the trainee teachers in two disciplines (taught in the third and fourth years) of a mathematics teaching degree course. We could observe that the *vaivém* was configured as an opportunity for preservice mathematics teachers to analyse personal and professional elements in an articulated way, understand their actions as students and teachers, reflect on their professional choices and desires, and to think about their professional future. Such reflections and analyses were supported by the fact that the *vaivém* is interactive, questioning, temporal, and problematises all trainees' written production. Hence, the *vaivém* is revealed as a potential instrument to analyse aspects of the movement of constitution of the PI of the preservice mathematics teachers, mainly regarding one of its dimensions: self-knowledge.

Keywords: Mathematics Education, Mathematics Teacher Education, Professional Identity, Written Communication.

Resumo

O objetivo deste artigo é analisar aspectos do autoconhecimento mobilizados por futuros professores no *Vaivém*, no que diz respeito ao movimento de constituição de sua Identidade Profissional (IP). O *vaivém* é um instrumento de comunicação escrita entre formador e (futuro) professor em formação. O estudo trata de uma pesquisa qualitativa, de cunho interpretativo, sobre os *vaivéns* produzidos por futuros professores em duas disciplinas (ministradas no terceiro e no quarto ano) de um curso de Matemática – Licenciatura. Foi possível observar que o *vaivém* se configurou como uma oportunidade de os futuros professores analisarem acerca de elementos pessoais e profissionais de modo articulado, de entenderem suas ações como estudantes e professores, de refletirem sobre suas próprias escolhas e desejos profissionais e de pensarem em seu futuro profissional. Tais reflexões e análises foram apoiadas no fato de o *vaivém* ser interativo, questionador, temporal e problematizar toda produção escrita dos futuros professores. Nessa direção, o *vaivém* se revela como um potencial instrumento para analisar aspectos do movimento de constituição da IP de futuros professores de Matemática, principalmente quanto a uma de suas dimensões: autoconhecimento.

Palavras-chave: Educação Matemática, Formação de Professores de Matemática, Identidade Profissional, Comunicação Escrita.

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1. Introduction

The Study and Research Group on the Education of Teachers who Teach Mathematics - Gepefopem - thinks it essential to propose formative contexts in which (preservice) teachers can be active in their education processes. Also, the group reckons that those preservice mathematics teachers' impressions, stories, knowledge, beliefs, and concepts - and, consequently, the movement to build their Professional Identity (PI) - should be considered when planning those teacher education actions (Cyrino, 2016, 2017; Garcia, 2014; Teixeira, 2013).

Valuing the communication movement that encourages the interaction of the people involved in the education process proves to be a way to achieve this intent. The written register, the importance of which has been highlighted in teacher education by some authors to expand the communicability already established in the education and enhance the professional development process, emerges as an interesting strategy (Cattley, 2007; Phillips & Crespo, 1995).

Thus, the *vaivém*³, as a written resource, appears as a possibility combined with (preservice) teachers' education process.

Vaivém is an assessment tool created and used by Professor Regina Buriasco in undergraduate and graduate classes since 1978. The tool is a communication space (in writing) between the teacher and the students (individually). In general, we can say that, in *vaivém*, the teacher asks a question to the whole class, and each student answers on a sheet of paper. From each student's answer, the teacher asks other questions, and make comments to the student (Silva, 2018, p. 56).

In this manuscript, we analyse the role of *vaivém* in the movement of the constitution of the preservice mathematics teachers' PI associated with self-understanding. We introduce below some aspects of the PI related to self-understanding, research, and the role of written communication, followed by methodological procedures, analyses, and final considerations.

2. Aspects of the Professional Identity associated with self-understanding and the role of written communication

The PI perspective assumed in this investigation is social, i.e., the social relationships of the subjects and their role in society are necessary characteristics for the movement of constitution of the teachers' PI (Beijaard, Paulien & Verloop, 2004). Also, the individual aspects, specific to each person's stories and experiences, are inserted in a social context and are determinants for this movement. Thus, although the individual carries his/her self and the voices of their other selves, as the PI is socially constructed, each subject can be analysed in his/her specificities (Kelchtermans & Hamilton, 2004).

³ It is a sheet that can be placed in a plastic bag in the middle of two white sheets at the ends, to maintain confidentiality between the two subjects involved in the communication.

Cyrino (2017) uses the expression “PI construction/development movement” because she understands, as does Hall (2015), that identity is “continuously formed and transformed concerning how we are represented or challenged in the cultural systems that surround us. [...] The fully unified, complete, secure, and coherent identity is a fantasy ” (pp. 11-12). The author considers that

the PI construction /development movement of the teacher who teaches mathematics⁴ takes place given a set of beliefs and concepts interconnected to self-understanding and knowledge about their profession, associated with autonomy (vulnerability and sense of agency) and political commitment. (Cyrino, 2017, p.704)

When expressing their Professional Identity, individuals carry the voices of others (subjects, texts, objects, experiences...), read and known as thinking partners (Kelchtermans & Hamilton, 2004). This is one of the reasons that lead us to say that the PI constitution movement is carried out socially. However, for analysis purposes, individuality (the aspects that are particular of each subject, based on their experiences and their way of seeing the world) can be represented by self-understanding (Beijaard, Paulien & Verloop, 2004; Gohier, Anadón, Bouchard, Charbonneau & Chevrier, 2001; Kelchtermans, 2009; Lasky, 2005).

We assume Kelchtermans’ (2009) perspective for self-understanding. Kelchtermans (2009) discusses PI based on the term *self*. According to him, the term Identity is not the most appropriate to refer to this process⁵, for which he prefers to use *self-understanding*. In other words, the process of self-understanding is the subject’s understanding of him/herself as a teacher; it is a product resulting from a continuous process of giving meaning to their own experiences. Self-understanding influences directly the way teachers teach, how they develop as teachers, and how they react to educational changes and, therefore, we understand that this is a dimension of the PI constitution movement.

Kelchtermans (2009) discusses five aspects of the self-understanding process: self-image, self-esteem, job motivation, task perception, and perspective of the future (Table 1).

Table 1 - Aspects of self-understanding associated with its characteristics and component

Aspects of self-understanding	Characteristics	Component
Self-image	It concerns how (preservice) teachers represent themselves as teachers.	Descriptive
Self-esteem	It has to do with judging the teachers’ performance in the work they do (“how well am I performing as a teacher?”).	Evaluative
Job Motivation	It relates to the reasons that encourage subjects to choose to be teachers	Conviction
Task perception	It refers to the tasks and duties for the teacher to develop a good work (educational program). It reflects the teachers’ answers to questions such as: “What do I need to do to be a good teacher?” “What are the tasks that I have to do to get the feeling that my job is well done?” etc.	Normative

⁴ Teacher who teaches mathematics.

⁵ According to him, Identity can imply that the process is static, neglecting its biographical nature.

Future perspectives	They cover the expectations about the working future of the teachers.	Temporal
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Source: Authors' elaboration based on Kelchtermans (2009).

Generally, PI has also been associated with written records in different aspects (Beijaard, Paulien & Verloop, 2004; Cattley, 2007; Cyrino, 2016; Soreide, 2006; Spilková, 2011; Watson, 2006).

Cyrino (2016) argues that for the (preservice) mathematics teachers, the opportunity to discuss and reflect on their written productions in their educational contexts is one of the elements that expand the possibilities of the PI constitution movement.

Beijjard, Paulien, and Verloop (2004) explain that the written productions, within the scope of the PI, have representativeness when talking about the development teachers' stories and narratives. Also, they have been considered as a methodological instrument for the analysis of works on this theme. The written narratives, represented by reports and studies of teachers' experiences and life stories, are significant for the movement of the PI constitution (Soreide, 2006; Watson, 2006).

Written productions are pointed out in the literature as a way for (preservice) teachers to return to past experiences, to evaluate their meanings, thus increasing the opportunity to reflect significantly on their current actions and behaviours (Cattley, 2007; Spilková, 2011). With this, in the context of analysis of experiences, the written productions are configured as an instrument that supports reflection and, therefore, expands the movement of constitution of the PI in contexts of teacher education.

3. Methodological Procedures

This research is qualitative of an interpretive nature and was developed in the context of the disciplines "Practice and Methodology of Teaching Mathematics I: Supervised Internship" and "Practice and Methodology of Teaching Mathematics II: Supervised Internship" of the mathematics degree course - at Londrina State University - UEL, offered in the 3rd and 4th years, respectively. Both disciplines are annual, with a workload of six class hours per week, and are generally taught by two professors. One of them is responsible for the most operational issues of the supervised internship, such as organising the practicum (observation) and the teaching practice (conduction), with a workload of two class hours per week. The other, with four hours a week, is responsible for the discussion of theoretical issues articulated with the practices, instrumentalising the preservice teachers to develop the Curricular Supervised Internship (Estágio Curricular Supervisionado – ECS). In 2016 and 2017, the first author of this study intervened, followed, and participated in the classes of a group of prospective teachers when they attended those disciplines, conducting it in partnership with their supervisors.

One of the interventions carried out by the first author was the use of the *vaivém* with the preservice teachers. The activity of answering the *vaivém* was carried out weekly for two academic years with a group of approximately 25 preservice teachers, starting on 05/12/2016

and ending on 01/23/2018. The generating question was: “How do you define yourself?” We use this question because we consider that the definition of oneself by the subject (and by peers) is part of the PI, particularly regarding self-understanding. The prospective teachers had to answer the question and bring the *vaivém* the following week. The first author (teacher educator) collected the plastic envelopes⁶ with the answers. They intervened with comments and by asking new questions, returning them to the preservice teachers the following week, to which they soon responded, starting a new cycle.

In this article, we analyse the *vaivém* produced by nine mathematics teachers in education (Kimberly, Tiffany, Carlos, Mariane, Diana, Laura, Joilson, Thomas, João⁷) to understand the movement of construction of their PIs concerning self-understanding, triggered by this written production.

In parallel to the mathematics teaching degree course (*licenciatura*), Kimberly was also a student of the mathematics research degree (*bacharelado*). She has always been very interested in discussions related to mathematics and mathematics education. During part of the undergraduate course, she participated in the Study and Research Group on Mathematics Education and Assessment (Grupo de Estudos e Pesquisa sobre Educação Matemática e Avaliação – Gepema).

Tiffany was a very interrogative person and was intensely involved in discussions related to mathematics education. She had the opportunity to work as a basic education teacher at times and also participated in Gepema.

Carlos demonstrated interest in the tasks proposed and was effectively involved in discussions related to mathematics education. However, due to his personal characteristics, he was more active in mathematics discussions only. He participated in the Institutional Program for Teaching Initiation Scholarships (Bolsas de Iniciação à Docência – Pibid) and gave private mathematics lessons for basic education students.

Mariane has always been very dedicated to her education. She was participative in the discussions and got involved in all the tasks proposed. She had also joined Pibid during undergraduate and had already worked as a teacher in basic education. In the year previous to this research, she worked in the production of textbooks at a company in Londrina.

Diana was involved, always very critically, in most activities. She worked as a mathematics teacher in basic education in the private school system. She also participated in an extension project in her undergraduate, related to the Education Observatory (Observatório da Educação) Program.

Laura was one of the most participative preservice teachers in the discussions, both related to mathematics and mathematics education. She was always engaged in carrying out

⁶ In this class, the *vaivém* was confidential, that is, only the educator had access to the information. The answer sheets were placed in a plastic with two white sheets at the ends, to ensure confidentiality.

⁷ The names are fictitious and were chosen by the future teachers. They signed an Informed Consent Form approved by the Research Ethics Committee of UEL.

tasks, and with the *vaivém* it was no different. Laura worked at a health post during the day and attended the undergraduate course in the evenings.

Joilson revealed specific characteristics for the discussions with the large group. He usually brought elements of philosophy and sociology to the discussions to complement the topics studied. This is mostly due to his other profession. Joilson, who worked in Londrina, is an economist with a master's degree in this area.

Thomas was the most critical preservice teacher in the entire class. He did not accept receiving the information without understanding it, which indicates maturity as a professional. He worked as a clothing store manager in Arapongas - PR.

João, like Laura, was one of the most participative in the discussions held. He lived in the rural area of the district of Tamarana, in Londrina, and previously worked as a health agent, until he got an internship in the area of mathematics at the Brazilian Agricultural Research Corporation (Empresa Brasileira de Pesquisa Agropecuária – Embrapa).

The nine preservice teachers were selected for this analysis because they were those who most participated in the collective discussions during both disciplines.

4. Aspects of self-understanding mobilised by the preservice mathematics teachers

We show below aspects of self-understanding mobilised that we could observe in the analysis of the preservice teachers' *vaivém*, considering the five dimensions discussed by Kelchtermans (2009), namely: self-image, self-esteem, job motivation, perception of professional tasks and future perspectives. Self-image and self-esteem will be treated together, as they are closely related to the preservice teachers' answers.

4.1- Self-image and self-esteem

When answering the question that triggered the *vaivém* (Figure 1), Kimberly put in evidence her self-image as a person and presented characteristics that may be in her self-image as a teacher, such as being **methodical**, which indicates someone organised and with pre-established routines.

Sou uma pessoa teimosa, metódica, apaixonada pelas coisas que faço, leal a quem amo, insegura e estressada. ⁸

Figure 1: Kimberly's written production (05/12/2016)

Source: The authors.

She believes that (Figure 2) if something doesn't go as she planned (as a student and as a teacher), she destabilises and stresses (another characteristic of her self-image).

⁸ I am a stubborn, methodical person, passionate about the things I do, loyal to those I love, doubtful and stressed.

i) Me considero teimosa pois gosto das coisas do meu jeito e sempre acho que minha opinião está certa até que me provem o contrário. ¹⁾
 É o fato de ser metódica e porque gosto das coisas muito planejadas e organizadas, e se algo não sai como eu esperava isso me estressa e me desestabiliza. ²⁾ 9

Figure 2: Kimberly's written production (06/09/2016)

Source: The authors.

The destabilization is also related to the concept of self-esteem, since it can indicate a possible evaluation of her actions (as a student, as a teacher, and, also, as a person). Self-esteem is the evaluative component of self-understanding (Kelchtermans, 2009).

Tiffany, in turn, also reveals aspects related to her self-image and self-esteem (Figure 3).

afascinante! ¹⁾ Brincadeira: Enfim me define como uma pessoa super ativa, extremamente empática, e que nem sempre é bom pois eu tomo conta das dificuldades dos outros e sofro como se fossem minhas. Sou perfeccionista, então gosto de tudo certinho e aí quando não consigo ²⁾ já me sinto burro, aí vai um tempo de recuperação. ³⁾ 10

Figure 3: Tiffany's written production (05/20/2016)

Source: The authors.

It is possible to observe that personal and professional self-image issues can be directly associated with self-esteem. Characteristics highlighted by Tiffany, such as being **empathetic** and **perfectionist**, can directly influence her actions as a teacher, since the way she relates to her peers (students, colleagues, direction/coordination) is particular. She connects “empathy” to **suffering** and “perfectionism” because she feels **cognitively inferior**.

Tiffany revealed negative and positive characteristics in her reflections about her self-esteem (Figure 4).

3) A aluna se sente muito fraca, feia, que devo exorbitantemente a desconfiar; já a prof se sente útil, assertiva e que fará a diferença na vida dos alunos, por amar o que faz e querer surpreendê-los sempre. ¹⁾ 11

⁹ i) I consider myself stubborn because I like things my way and I always think that my opinion is right until proven otherwise. The fact that I am methodical is because I like things that are very planned and organized, and if something doesn't work out as expected, it stresses and destabilises me.

¹⁰ Wonderful! Just kidding; Anyway I define myself as a super active person, extremely friendly, which is not always good because I take over other people's difficulties and suffer as if they were my own. I am a perfectionist, so I like that everything is just right and then when I can't do it, I feel stupid, so it takes me time to recover.

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Figure 4: Tiffany's written production (07/10/2017)

Source: The authors.

At this moment, Tiffany evaluates her actions as a student and as a teacher. Unlike her experience as a teacher, Tiffany mobilises negative aspects of self-esteem as a student. We infer that such negative views are associated with the traditional and formal aspects that still accompany the initial teacher education process, often influenced by the disciplinary model that permeates it. The negative aspects may also be related to public judgment experiences that Tiffany may have gone through, since this happens, in general, in mathematics courses. Preservice teachers report experiences in which their mistakes (mathematical or not) are addressed as a lack of knowledge, and they are often even mocked. Kelchtermans (2009) argues that such experiences significantly impact (prospective) teachers' self-esteem. However, Tiffany indicates positive characteristics for her self-esteem as a teacher, which she thinks it is essential for her to feel comfortable at work and for her well-being as a teacher (Kelchtermans, 2009).

In the **personal assessment of actions**, when he answered the question that generated the *vaivém* (Figure 5), Carlos highlighted characteristics of his self-image and self-esteem that possibly permeate his actions as a teacher, such as being **communicative** and **responsible**.

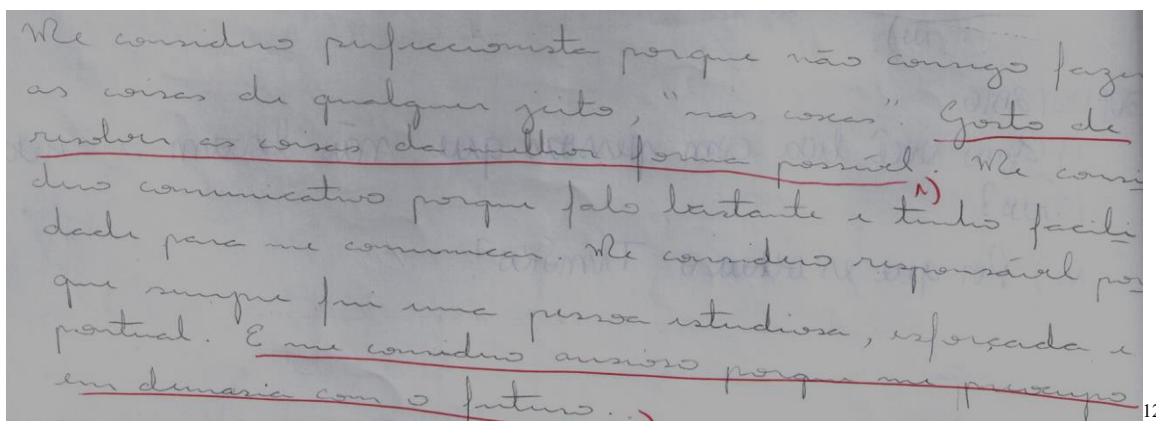


Figure 5: Carlos' written production (06/02/2016)

Source: The authors.

He is very organized and likes to develop his actions in an intentional and controlled way. This conclusion is presented and based on the assessment he makes of himself, as he likes things "to be resolved in the best possible way" (Figure 6).

¹¹ Tiffany the student feels very fragile, with failures, and she feels she is a disappointment; Tiffany the teacher, on the other hand, feels useful, accessible and thinks she will make a difference in the students' lives, for loving what she does and always wanting to surprise them.

¹² I consider myself a perfectionist because I can't do things carelessly, just "slapping it together". I like to solve things in the best possible way. I consider myself communicative because I speak a lot and I find it easy to communicate. I consider myself responsible because I have always been a studious, hard-working and I am always on time. And I think I am anxious because I worry too much about the future.

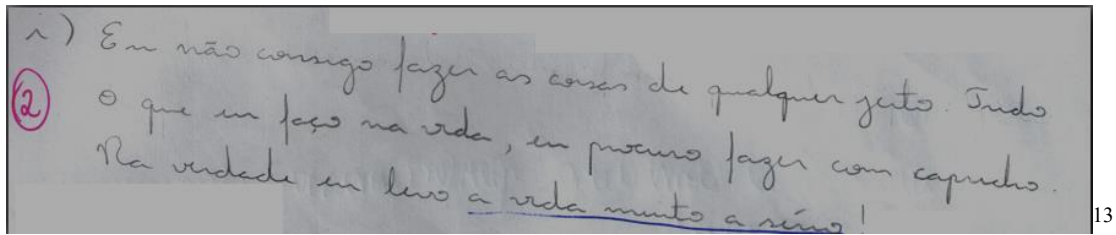


Figure 6: Carlos's written production (06/23/2016)

Source: The authors.

About his vision as mathematics teacher (self-image), Carlos points out that his **exaggerated sincerity** gets in the way a little bit as a professional (Figure 7). This is related to how he evaluates his work, and, therefore, to the evaluative component of self-understanding: self-esteem (Kelchtermans, 2009). We infer that such an assessment is based on what people say about him and how he sees himself.

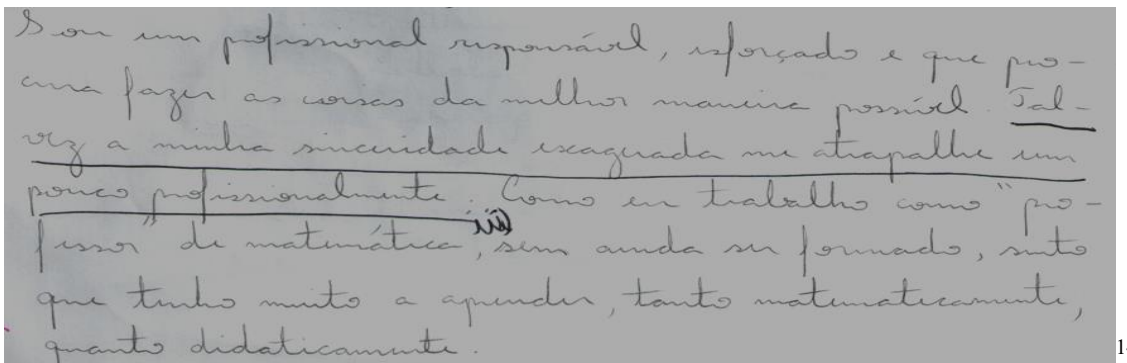
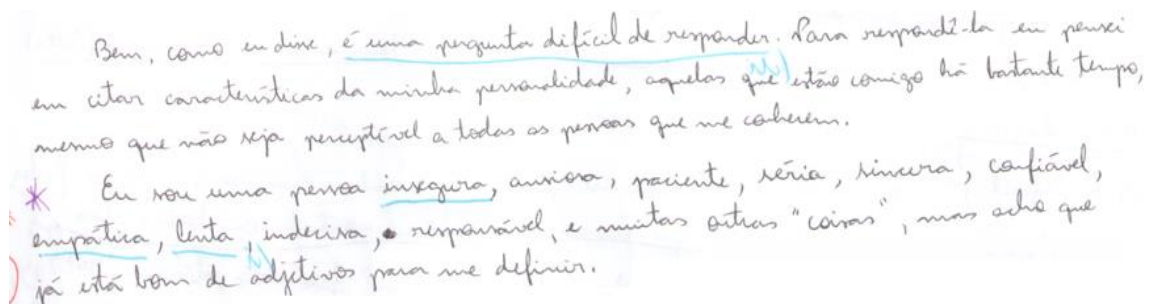


Figure 7: Carlos's written production (07/08/2016)

Source: The authors.

When answering the question that generated the *vaivém* (Figure 8), Mariane shows self-image characteristics that can permeate her actions as a teacher, such as **empathy** and **responsibility**. However, it also reveals aspects that relate to evaluating her self image (self-esteem), such as being **slow, insecure, and anxious**.



15

¹³ i) I can't do things carelessly. Everything I do in life, I try to do with care. In fact, I take life very seriously!

¹⁴ I am a responsible, hard-working professional who seeks to do things in the best possible way. Maybe my exaggerated sincerity gets a little in my way, professionally. As I work as a mathematics "teacher", without having finished my degree, I feel that I have a lot to learn, both mathematically and didactically.

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Figure 8: Mariane's written production (05/19/2016)

Source: The authors.

The fact that Mariane argues that some of those characteristics are not perceptible to other people gives us indications that it is possible that the way people see her is not close to how she sees herself. However, such dynamics of the relationship between her self-perception and what people think about her is decisive in the scope of self-image (Kelchtermans, 2009).

In Diana's answer (Figure 9) to *the* generating question, we observed that characteristics such as being **humble** could be linked to her self-image as a teacher since a humble teacher tends to place their students in an equal position (in terms of teaching and learning) concerning themselves. Being a “**good person**” indicates how Diana evaluates herself with her self-esteem. Humbleness can be a characteristic that allows her to make that judgment.

Ok, quebri a caixa para responder e descobri que
 não sei! Talvez eu tentar me definir eu limite,
 sem intenções para isso, alguns dos meus defeitos,
 como algumas qualidades.
 Sou um ser humano cheio de defeitos e qualidades,
 qualidades que por vezes se tornam defeitos e vice-versa.
 Busco alcançar meus objetivos, então certo eu erro,
 neste e em vários caminhos, eu tento.

16

Figure 9: Diana's written production (05/13/2016)

Source: The authors.

Negative aspects of self-esteem - such as confusion and pride - were also discussed by Diana (Figure 10).

¹⁵ Well, as I said, it is a difficult question to answer. To answer it, I thought of citing characteristics of my personality, those that have been with me for a long time, even though it is not noticeable to all the people who know me. I am an insecure, anxious, patient, serious, sincere, trustworthy, empathetic, slow, doubtful, responsible, and many other “things”, but I think it is already a good list of adjectives to define me.

¹⁶ Okay, I racked my brains to answer that, and found out I don't know! Perhaps trying to define myself, I limit, without intentions, some of my flaws and some qualities. I am a human being full of flaws and qualities, qualities that sometimes become flaws and vice versa. I try to reach my goals, being right or wrong, in this and several ways, I try.

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Sou tão confusa que me definir é um dos mais complicados desafios. O que eu quis dizer, foi que independente de como é que eu escolho para atingir um objetivo eu não desisto dele, por mais que eu erre, "quebre a cara", ou persistente fico complicada para mim entender minhas confusões. As pessoas julgam as outras "naturalmente", assim acontece comigo, por vezes é mais fácil me julgarem a conhecer um pouco mais de mim. Não é bem nem assim, depende muito do ponto de vista. Hoje eu tive oportunidade apagar meu orgulho, quando relaciono a não dar meu de opiniões, não conseguir pedir desculpas (exemplos). Tento trabalhar muito nisso, mas as vezes não dá.

Figure 10: Diana's written production (06/02/2016)

Source: The authors.

Such aspects and those pointed out by Tiffany can also relate to public judgment experiences that Diana went through (Kelchtermans, 2009).

Laura presented the characteristics of her self-image, self-esteem that can be related to her actions as a teacher (Figure 11).

i) Acredito que sou determinada, por quando desejo alguma coisa não desisto até conseguir *

ii) Acredito que estou sempre atenta em tudo que ocorre ao meu redor, prestando atenção e analisando, por isso sou mais ouvinte *

Figure 11: Laura's written production (06/15/2016)

Source: The authors.

Determination, characteristic of her self-image, can be associated with the motivation that keeps her in the mathematics teaching degree course and in the search to be a teacher. Being **alert** can indicate an essential characteristic of her PI and her self-image for classroom relations. Furthermore, being alert and perceptive allows her to infer that she is more of a listener, an aspect of her self-esteem, and the result of self-judgment of her actions.

¹⁷ I am so confused that defining myself is one of the most complicated challenges. What I meant was that regardless of the path I choose to reach a goal, I don't give up on it, no matter how much I make a mistake, no matter how much I fail, I am persistent. It gets complicated for me to understand my confusions. People judge others naturally, so it happens to me, sometimes it is easier to be judged to know a little more about myself. It is neither good nor bad, it depends a lot on the point of view. If I could today I would get over my pride, when it comes to not giving up opinions, not being able to apologise (examples). I've been working on it a lot, but sometimes it's out of my control.

¹⁸ i) I believe I am determined, because when I want something I don't give up until I get it. ii) I believe that I am always attentive to everything that happens around me, paying attention and analysing, so I am more of a listener.

Joilson, by answering the question that generated the *vaivém* (Figure 12), revealed essential characteristics that influence his actions as a teacher, such as the **emotional factor**. The students' or teachers' emotional aspects within the scope of the teaching profession cannot be ignored.

me defino como um ser que prioriza a consciência, mas respeita certas emoções (as boas, preferencialmente).
Uma vez, em uma dinâmica fizeram a mesma pergunta e não soube responder com clareza. Após certo tempo de reflexão, pude definir como um ser humano que obedece a razão, distinguindo o ^{conceito} certo do errado, mas, considera muito o fator emocional.

19

Figure 12: Joilson's written production (05/15/2016)

Source: The authors.

In Thomas's written production (Figure 13), we could observe the features of his self-image.

sou uma pessoa muito ocupada, sou estudioso na medida da possível, sou bastante trabalhador e esforçado.
Tento sempre que posso realizar todas as tarefas que me são propostas. gosto de cachorro, de assistir filmes e comer doce.
Interajo com um grupo fechado de pessoas, não sou muito simpático; sou firme em minhas respostas e por isso gosto de debates, defendo meu ponto de vista e argumento a favor dele.

20

Figure 13: Thomas' written production (05/28/2016)

Source: The authors.

Defending his points of view and being hardworking and argumentative are characteristics that can influence his actions as a student and as a teacher. Not being too friendly is an echo of a personal self-assessment and, therefore, in our view, it is associated with self-esteem.

¹⁹ I define myself as a being who prioritises conscience, but respects specific emotions (preferably good ones). Once, in a dynamic, they asked the same question and did not know how to answer it clearly. After some time of reflection, I was able to define myself as a human being who obeys reason, distinguishing right from wrong, but considers the emotional factor a lot.

²⁰ I am a very busy person, I am studious as much as possible, I am very hardworking. I always try to do all the tasks that are proposed to me. I like dogs, watching movies and eating sweets. I interact with a closed group of people, I am not very friendly; I am firm in my answers and for that reason I like debates, I defend my point of view and I argue for it.

4.2 Job Motivation

To obtain information about the job motivation, in a moment of *vaivém*, we tried to understand why Kimberly thinks she is doubtful (characteristic of her self-image).

ii) Vou undecida pois penso muito antes de escolher alguma coisa =
mesmo sabendo que tenho certeza, mudo de ideia. Estava decidida em
mudar para o Bacharelado desde o fim do ano passado, mas de muito
insistiram, estou tentando fazer os dois.

21

Figure 14: Kimberly's written production (06/09/2016)

Source: The authors.

In figure 14, we can observe that, for Kimberly, the choices related to her professional future were influenced by other people. Based on other peoples' notes, she decided to do both qualifications concurrently. This can be a relevant characteristic of her PI: the **relationship with her peers**. PI is associated with how people see themselves, but also how they interact with their peers (Beijaard, Paulien & Verloop, 2004; Gohier et al., 2001; Kelchtermans, 2009; Lasky, 2005). This characteristic was indicated in another written production, in which Kimberly was asked to explain the dynamics to which she had previously referred about the qualifications (Figure 15).

iii) Bem, eu tinha vontade de fazer as duas habilitações, mas achava
que não dava conta (e eu estava certa haha!). Estão, pessoas ao
meu redor como meu professor do PIBID, o Gabriel (meu amigo), minha
me-diretora me incentivaram a fazer os dois, e aqui estou!

22

Figure 15: Kimberly's written production (06/23/2016)

Source: The authors.

Kimberly's choice to take two qualifications simultaneously was not related to the fact that she does not like a specific area, or that she does not have the autonomy to choose with which area she would like to work. She decided based on her peers' advice, despite considering it would be wearying to take both qualifications simultaneously. It is possible to observe that she wanted to attend both. Also, for the educators, this has always been evident, due to how she engaged in the discussions about the different specificities.

²¹ ii) I am doubtful because I think a lot before choosing anything and even when I think I'm sure, I change my mind. I was determined to move to the research degree (bacharelado), since the end of last year, but after [friends] insisted a lot, I am trying to do both.

²² iii) Well, I wanted to do both qualifications, but I didn't think I could handle it (and I was right haha!). So, people around me, like my PIBID teacher, Gabriel (your friend), and my former director encouraged me to do both, and here I am!

Aspects referring to job motivation were also highlighted when Kimberly discussed what the mathematics teaching degree course had given her (Figure 16).

23

Figure 16: Kimberly's written production (12/16/2016)

Source: The authors.

The maturity she mentions, associated with questions of knowledge about teaching practice, motivated her to continue the course and be a “good teacher.” The social conditions in which the trainees live greatly influence their job motivation (Kelchtermans, 2009). In this case, the mathematics teaching degree course had a positive impact.

Given his reflection on the reasons for which he decided to become a teacher, Carlos exposed his arguments (Figure 17).

24

Figure 17: Carlos' written production (09/27/2017)

Source: The authors.

Carlos thought he had no vocation to be an electrical engineer, so he looked for another course. He was questioned, and he explained what he understood a vocation was (Figure 18).

25

²³ No, the course is providing me with maturity (I think it is not the word), I think knowledge about teaching practice.

²⁴ iii) Because, unfortunately, I flunked much in the disciplines and I did not obtain professional success, which led me to conclude that I was not fit for electrical engineering. iv) You're welcome. Because I only had the opportunity to go to the board in the simulation of his class.

²⁵ ii) Vocation is an inclination, a tendency or skills that leads an individual to pursue a particular career or profession.

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Figure 18: Carlos' written production (10/17/2017)

Source: The authors.

The **vocation**, understood in this way, was the reason for Carlos to study mathematics teaching degree. Therefore, is related to the conviction component of self-understanding: job motivation.

When reflecting on some of her personal characteristics (self-image), Laura said she was determined and alert (Figure 19).

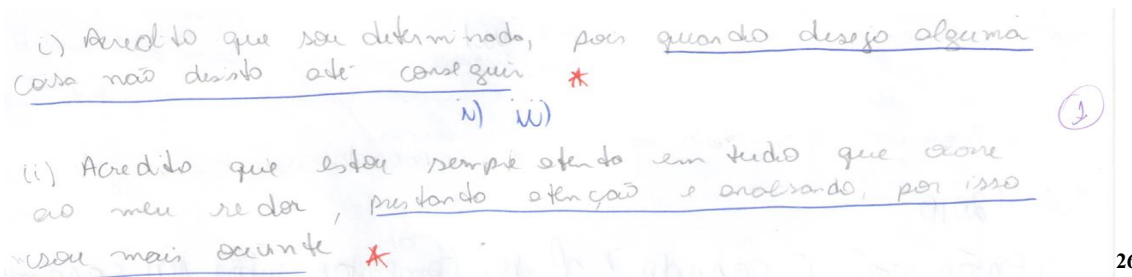


Figure 19: Laura's written production (06/15/2016)

Source: The authors.

When asked about how her persistence and determination, justified by desire, had to do with the mathematics course, Laura said that her choice to study mathematics teaching degree course had not happened because she liked mathematics as a discipline (as had happened with other students of the course). She wanted to be a teacher because she liked teaching (Figure 20). Such aspects are linked to job motivation.

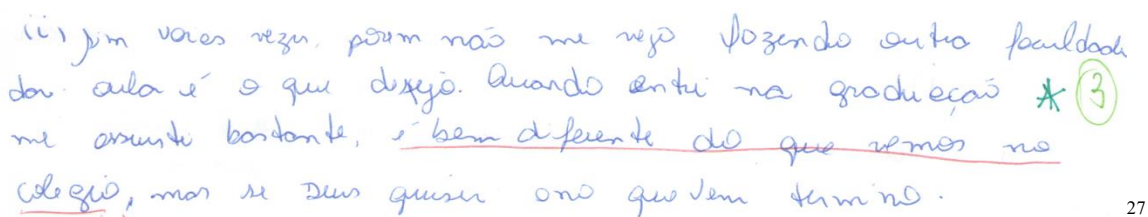


Figure 20: Laura's written production (09/05/2016)

Source: The authors.

During the work with the *vaivém*, we noticed that Joilson was experiencing some conflict with his professional future, and he wrote about some possibilities (Figure 21).

²⁶ i) I believe I am determined, because when I want something I don't give up until I get it. ii) I believe that I am always attentive to everything that happens around me, paying attention and analysing, so I am more of a listener.

²⁷ iii) Yes several times, but I don't see myself going to another college, teaching is what I want. When I started graduation, I was quite scared, it is very different from what we see in high school, but God willing, I'll finish next year.

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nais, já que terei mais opções no mercado de trabalho, este diploma de licenciatura abrirá muitas portas!

Pode ser como professor da educação básica, do ensino superior, pesquisador da área pública/privada ou dono do próprio negócio, acho que estarei esclarecido nesse trajeto a longo prazo. *

28

Figure 21: Joilson's written production (15/08/2016)

Source: The authors.

Although Joilson could have other professional possibilities as an administrator or researcher, the **desire to be a teacher** was present. As the teaching degree course opens more professional doors, it motivates him to complete it and perhaps become a teacher.

Thomas reported not looking for the mathematics teaching degree course to be a teacher (Figure 22).

- Liti pouco antes do vestibular da UEL e nem sabia que ela existia. Trabalhava em Maringá e nem conhecia a UEM, então imagine a UEL. Era gerente de duas lojas enormes lá e não tinha outra vida que não era trabalhar, então não conhecia o mundo externo a empresa.

Um dia fui transferido para a empresa de Rolândia, mas eu tinha 16 anos ainda e estudava o ensino médio. Minha professora de lutas que me contou da existência da UEL e praticamente me obrigou a se inscrever. Eu não estudei o vestibular só pra ver como é, e no próximo ano vou estudar daí. Eu aceitei então. Ela foi na minha casa me buscar para levar eu fazer o vestibular nas 2 fases. Me levou e me trouxe de volta.

Todos os meus amigos odiavam matemática e como eu ia fazer o vestibular "só pra ver como era", resolvei ir contra eles e me inscrever para matemática, ou seja estou aqui por BIRRA. hahaha. *

Quando eu passei não entendi o por que afinal não tinha estudado "perceário nenhuma", mas o esforço de minha professora foi tão grande que eu não podia deixar de tentar fazer o curso, já tinha passado no 1º. 1.

29

²⁸ and more, since I will have more options in the job market, this degree will open many doors. It may be as a teacher of basic education, higher education, researcher in the public/private area or a business owner, I think I will be informed on this long-term path.

²⁹ Until just before the UEL entrance exam, I didn't even know it existed. I worked in Maringá and didn't even know UEM, let alone UEL. I was the manager of two huge stores there and had no other life than working, so I didn't know the world outside the company. One day I was transferred to Rolândia's company, but I was 16 years old and was studying in high school. My art teacher who told me about UEL and practically forced me to sign up. I didn't study "a damn thing" for the entrance exam, but she said, you're an excellent student, take the entrance exam just to see how it is, and next year you'll study there. I accepted, then. She went to my house to pick me up to take me to take the entrance exam in both phases, she took me and brought me back. All my friends hated math and as I was going to take the entrance exam "just to see how it was", I decided to go against them and applied for math, that is, I'm here for a tantrum, hahaha. When I passed, I did not understand why I

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Figure 22: Thomas' written production (06/03/2016)

Source: The authors.

He was the manager of a clothing store in Rolândia and did not want to be a teacher. What made him enroll in the entrance exam was his relationship with a teacher. However, he believes that the course can contribute to his personal and professional life (Figure 23).

ii) Pode sim, pode contribuir financeiramente e também pessoalmente. das aulas no ensino médio, faculdade, cursinhos e supletivos talvez seja legal, gesto de trabalhar com jovens então talvez dar aulas para estes meus adultos me faça bem, pois interagir com pessoas me faz bem. *** iii)

30

Figure 23: Thomas' written production (02/17/2017)

Source: The authors.

The **undergraduate course dynamics** made Thomas interested in it and encouraged him to consider the possibility of becoming a teacher (job motivation).

4.3 Tasks Perception

In a specific discussion on the planning of the supervised internship teaching practice, Kimberly explained her expectations concerning recognising her professional tasks.

6. Queria ter feito o plano inteiro, planejado todos os exercícios e todos os momentos das aulas hehe (iii) P. 6. iii)

31

Figure 24: Kimberly's written production (09/14/2016)

Source: The authors.

As the supervised internship teaching practice is conducted in pairs, she recognises that she should have **participated more intensively in the lesson planning process**. We interpret that this has to do with what she believes about being a “good teacher” (idealisation) and the role that lesson planning has. She also wrote about the importance of being autonomous (Figure 25).

6. Agora que já passou a SEMAT, posso afirmar que foi uma experiência única. As vezes acho que eu e a... seguramos muito a mão da outra. Sempre fizemos as coisas juntas e um dia não pode mais acontecer (de maneira tão intensa). Cada uma vai seguir seu rumo, como você e o Gabriel fizeram. Seredeto que trabalhar contigo não era, fazer IC conjunta (na verdade é o Takito) mas algumas das experiências que já estão me permitindo uma independência de... iii)

32

had not studied “a damn thing” after all, but my teacher's effort was so great that I couldn't help trying to take the course, I had already passed the entrance exam. So I tried.

³⁰ You can, you can also contribute financially personally. Teaching in high school, college, courses and youth and adult education may be cool, I like working with people, so maybe teaching adults will do me good, because interacting with people does me good.

³¹ I wish I had done the whole plan, planned all the exercises and all the moments of the classes hehe

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Figure 25: Kimberly's written production (12/16/2016)

Source: The authors.

Kimberly reflected on the importance of not depending on others (from her education partner) to develop her professional tasks. In the excerpt (Figure 25), she reported that the experience of writing an article in the Week of Mathematics (SEMAT) made her start emancipating from her education partner (Tiffany).

Tiffany considered herself a “good teacher” and wrote on *vaivém* what she understands by being “a good teacher” (Figure 26).

e) É ser acessível, honesto e me permitir perguntar e sugar tudo o que eu posso, sendo alguém que erro, mas que eu admiro muito. (iii)

33

Figure 26: Tiffany's Written Production (09/08/2016)

Source: The authors.

The ideal that each subject has about what it is to be a **good teacher** can mean an objective to be achieved, characteristics to be developed by that subject in his/her tasks as a teacher.

The possible change in Thomas's career, reported in the previous section, made him recognise the teacher's tasks, and he felt he needed other **experiences besides the supervised internship**.

ii) Dei aula em Arapongas este ano por 1 mês apenas. * Era 2 Terceiros anos. 3ºD e 3ºC. Um quieto e um bagunçeiro. Gostava mais do Bagunçeiro. Trabalhei com eles geometria e propriedades, distância entre pontos. Não era PSS. Foi voluntário mesmo - Estava com vontade de dar aula pra saber como é e um colega do centro de Arapongas deixou eu dar aula lá. O prof. ficou na sala junto mas sentado na cadeira dos alunos, e as vezes ele não ficava. Eu guiei a aula e o aprendizado utilizando as minhas armas, carisma e conquistando os alunos. Eles queriam fazer não para aprender, mas pra mostrar pro mim que eles conseguiram e eu ia desafiando eles, nestas de fazer pro me mostrar e discutir resultados no quadro eles aprenderam. Minha aparência física de alguma forma colaborou para isso, tanto para as aulas, quanto para o colega e a prof. autorizar.

34

³² Now that SEMAT has passed, I can say that it was a unique experience. Sometimes I think Tiffany and I hold each other's hands a lot. We always do things together and one day it cannot happen (so intensely). Each of us will follow her path, as you and Gabriel did. I believe that writing articles without her, doing Scientific Initiation by myself (actually with Takito) are some of the experiences that are already allowing me this emancipation from Tiffany and Kimberly.

³³ It is being accessible, honest and allowing myself to ask and get all I can, being someone who makes mistakes, but that I admire a lot.

³⁴ I taught in Arapongas this year for 1 month only. I had 2 third grades. 3rd D and 3rd C. A quiet one and a messy one. I liked the messy better. I worked geometry and properties, distance between points with them. It

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Figure 27: Thomas' written production (07/25/2017)

Source: The authors.

At a specific moment of *vaivém*, João discussed his needs **to study more, interpret some texts, and improve his writing** so that next year the planning process of the Supervised Internship could be better.

Questioned, João wrote about what could be accomplished to minimise the difficulties he had in planning (Figure 28).

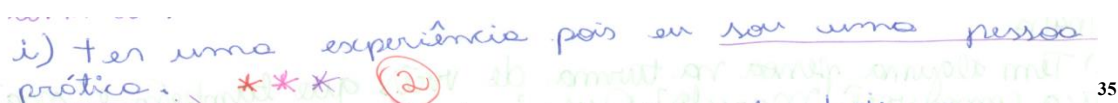


Figure 28: João's written production (01/26/2017)

Source: The authors.

Like Thomas, João understands that it is necessary to develop other experiences (in the classroom) to become a better-prepared professional, which has to do with the tasks he imagines to perform to become a good teacher.

Questioned, João discussed in the *vaivém* how his religion (once he defined himself as religious) would influence his actions (Figure 29).

usado e faz diferente" assim só podemos cobrar um mundo melhor se ~~o~~ fazer a todos ter ^{acesso} conhecimento por isso decidi ser professor para contribuir neste conhecimento diverso e não só matemática, mas respeito, educação, amor e nos ajudando uns aos outros, e algo mais.' There is a circled number 4 and a star symbol. There is a page number 36 in the bottom right corner." data-bbox="125 478 870 610"/>

Figure 29: João's written production (01/10/2017)

Source: The authors.

When asked whether he believed the teacher's role goes beyond teaching mathematics, João answered that it did (Figure 30).

was not PSS. It really volunteered. I was in the mood to teach a class to find out what it is like and a college in the center of Arapongas let me teach there. The teacher was in the room together, but sitting in the students' chair, and sometimes she was not. I guided the class and learning using my weapons, charisma and winning over students. They wanted to do it not to learn, but to show me that they had done it. I was challenging them, by doing it to show me and discuss results on the board, they learned. My physical appearance somehow contributed to this, both for classes, as for the school and the teacher to let me teach.

³⁵ i) Have an experience because I am a practical person.

³⁶ iii) In almost everything, I believe that only "sin those who know the word and do it differently," so we can only demand a better world if we make everyone have access to knowledge, so I decided to be a teacher to contribute to this knowledge and not only mathematics, but respect, education, love of neighbor helping each other, and something else.

ii) sim, principalmente nos dias de hoje que algumas crianças chegam na escola sem estrutura familiar e o professor tem que deixar alguma coisa para o aluno tentar através da matemática dar um ensinamento ético, uma motivação um direcionamento, contribuir para melhorar a qualidade de vida do aluno, atitudes de alunos. (5)

37

Figure 30: João's written production (01/26/2017)

Source: The authors.

Those elements, which go beyond mathematics teaching, seem to be an **idealisation of a role** that João wants to assume as a teacher when working in basic education (tasks perception), in the sense of recognising his role as an educator, beyond someone who just teaches mathematics. Such idealisation, also highlighted by other preservice teachers, goes in the direction of what Kelchtermans (2009) argues: that the recognition of tasks is associated with the professional's beliefs about what constitutes a good education, about their duties and moral responsibilities.

4.4 Future prospects

Mariane wrote in the *vaivém* about her intention of becoming a good teacher (Figure 31).

ii) concordo.

iii) Para mim ser um bom professor é se preocupar com a aprendizagem dos alunos; é pensar "será que eles estão aprendendo/entendendo desta forma?", "Porque eles não estão aprendendo?", "O que eu poderia fazer e mudar na minha maneira de ~~dar~~ dar aula para que eles aprendam/entendam?" ou: para ajudá-los a aprender.

Um professor que não pensa essas coisas, para mim, não é um bom professor. Claro que não basta pensar, esses pensamentos devem gerar mudanças nas ações. Só que ~~isto~~ isto, implica que para mim eu sou uma boa professora, porque eu sempre penso essas coisas, mas ~~essa~~ na verdade não me considero assim. Penso que eu tenho o requisito básico, e posso vir a ser, mas não sou.

38

³⁷ ii) Yes, especially nowadays that some children arrive at school without a family structure and the teacher has to leave something for the student to try through mathematics to give an ethical teaching, motivation and a direction, to contribute to improve the quality of life of the student, change the attitude of the students.

³⁸ iii) For me to be a good teacher is to be concerned with students' learning, it is to think "are they learning/understanding this way?" "Why are they not learning?" "What could I do and change the way I teach, so that they learn/understand?" A teacher who does not think these things, for me, is not a good teacher. Of course, it is not enough to think, these thoughts must generate changes in actions. Only this implies that for me I

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Figure 31: Mariane's written production (9/21/2016)

Source: The authors.

She can think of a good teacher's characteristics, but she still doesn't consider herself that way. We infer that the fact that the changes go beyond thoughts is what makes her not see herself as a good teacher yet (an aspect of her self-esteem). However, the indication that she fulfills the requirements **to be a good teacher** and that changes can happen in the future points to aspects related to future perspectives. According to Mariane, such changes will occur through experience (Figure 32).

iii) Porque eu sou muito inexperiente ainda. E, a respeito daquilo que falamos sobre talento/facilidade, eu acho que não tenho tanta facilidade quanto ~~algumas~~ ^{algumas} pessoas (embora ~~eu~~ tenha mais que outras), e por isso, preciso de mais experiência para me tornar uma boa professora. Mas acho que o mais importante eu tenho, não preciso ter (muita) paciência comigo mesma, para não desistir no meio do caminho. JK) * * ☺ 39

Figure 32: Mariane's written production (10/11/2016)

Source: The authors.

Carlos presented aspects related to future perspectives when he commented that he still needed to learn more about mathematics and how to teach it.

Sou um profissional responsável, esforçado e que procura fazer as coisas da melhor maneira possível. Talvez a minha sinceridade exagerada me atrapalhe um pouco profissionalmente. Como eu trabalho como "professor de matemática", sem ainda ser formado, sinto que tenho muito a aprender, tanto matematicamente, quanto didaticamente. 40

am a good teacher, because I always think these things, but in fact I do not consider myself that way. I think I have the basic requirement, and I may be, but I am not.

³⁹ ii) Because I am still very inexperienced. And, with regard to what we talk about talent/ease, I think I am not as easy as some people (although I am more than others), so I need more experience to become a good teacher. But I think the most important thing I have, I just need (a lot) patience with myself, so as not to give up halfway.

⁴⁰ I am a responsible, hard-working professional who seeks to do things in the best possible way. Maybe my exaggerated sincerity gets a little in my way, professionally. As I work as a mathematics "teacher", without having finished my degree, I feel that I have a lot to learn, both mathematically and didactically.

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Figure 33: Carlos's written production (07/08/2016)

Source: The authors.

When asked about how he was feeling in the disciplines, João also reflected on his professional future, however not in the long run, as Carlos and Mariane did (Figure 34).

41

Figure 34: João's written production (09/15/2016)

Source: The authors.

The characteristic of being **disorganised** reveals an aspect of his PI that, in his opinion, needs to be changed to improve his work. Besides organisation, he feels he needs to **study more, to interpret some texts, and improve writing** so that, in the following year, the planning process of the supervised internship could be better. This reveals future professional prospects in the short term.

5. Some results: *the vaivém* as an instrument to mobilise aspects of self-understanding

The *vaivém* was crucial for the movement of the PI constitution of these preservice teachers regarding self-understanding. Aspects of self-esteem and self-image were mobilised in the answers to the first question of the *vaivém*. We could have started *vaivém* with a more specific question, but we believed that it would limit the answers in terms of mobilising personal aspects. Starting the *vaivém* with a very general and personal question allowed preservice teachers to reveal without embarrassment information such as self-esteem and self-image, as their characteristics tend to be more personal.

With the *vaivém*, the teacher's educator had the opportunity to get to know the preservice teachers better both in personal terms - notably when discussing self-image and self-esteem - and in professional terms, which we consider essential for relationships in teacher education contexts. For example, although Carlos, João, and Laura did not reveal their personal characteristics in collective discussions, the *vaivém* was of great help to get to know them.

⁴¹ iv) Half lost, I am suffering a little, it is necessary to be organised to interpret some texts and to read, and if I am disorganized I cannot study two things at the same time, reconciling, I write poorly but everything is learning, I hope that next year it will become easier for me.

Also, the confidentiality (only the educator and the preservice teacher had access to the discussions) of the instrument ensured that preservice teachers would write and share information - including negative ones - without any constraints about their self-images. Bearing in mind that people are generally afraid to publicly share their limitations, the *vaivém* made this behaviour possible. To answer the questions on the *vaivém*, the preservice teachers were mobilised to analyse and evaluate their actions.

As for the job motivation, the *vaivém* was fundamental for them to think about their choices and desires in professional terms. However, reflections were not naturally mobilised but rather encouraged by questions and associated with personal issues. It seems that the teacher education do not reflect much about their professional choices and desires. Rarely do such discussions take place in teacher education contexts, and often the teachers themselves do not make clear decisions or know what they want professionally. Therefore, providing opportunities for awareness is very significant for the movement of constitution of the PI, and the *vaivém*, being interactive and questioning, showed to be a good opportunity for this to happen.

Regarding the tasks perception, the fact that the *vaivém* has the characteristic of problematising all the written production of preservice teachers helped them to think about the characteristics that a teacher needs to have to be considered good. This turns out to be positive because, although there is no ready formula, a possible professional idealisation guides the construction and actions of the preservice teachers. Beliefs are the starting point for change, and idealisation is a likely ending point (not fixed, often changed).

The *vaivém* helped preservice teachers to think not only about professional idealisation but also about what to do to achieve it. Developing classroom practices besides those developed in the supervised internship is an example of those possible changes. The *vaivém*, then, means an instrument that complements the education actions already developed, since it motivates preservice teachers to think about it and put into practice what they believe, as in the case of Thomas.

Regarding future perspectives, as *vaivém* has a temporal characteristic - the discussions are held throughout the school year and unhurriedly (in this research, two academic years) -, it helps preservice teachers to gradually recognise the personal and professional characteristics that must be changed for professional self-satisfaction. For this reason, controversial and essential aspects generally not discussed in teacher education contexts, such as the question of the existence (or not) of vocation or talent can be problematised.

6. Conclusion

The information presented in this article, taken from the preservice teachers' *vaivém*, is not exhausted in terms of aspects of self-understanding. There are many others that could be analysed based on the information we had about the PI, such as knowledge, beliefs, political commitment, among others. We chose to explain the issues related to self-understanding, precisely because we believe that the *vaivém* is a potential instrument for analysing the professional and personal aspects of the PI.

We could observe that the *vaivém* was configured as an opportunity for preservice teachers to reflect on personal and professional elements in an articulated way. With the activities adapted to the context, the *vaivém* gave them a voice at the same time that allowed them an opportunity to analyse their actions as students and teachers, to reflect on their professional choices and desires, and to think about their future as teachers. This is all because the *vaivém* is interactive, questioning, temporal, and problematises the written productions. Not limited to themselves, the teachers in education were also able to go further and analyse their peers and their educators. In short, this instrument showed to be an enhancer of the relationship between the educator and the preservice teachers.

The written production played a fundamental role in the analysis of the PI of those preservice teachers, because, although they did not verbalise in collective discussions, much of the information registered in the *vaivém* – much of it with a personal connotation, based on personal trajectories-, the preservice teachers, as they wrote and received constant feedback, could reflect and seek new paths for other issues. Therefore, we understand the *vaivém* as a potential instrument to analyse the PI of the (preservice) mathematics teachers, especially regarding the individual aspects of the PI associated with self-understanding.

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