



The what and why of primary and secondary school teachers' informal learning activities



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ABSTRACT

This study examines primary and secondary school teachers' professional development through informal learning activities and the reasons for undertaking these informal learning activities. For this purpose, 41 interviews were conducted and data were analysed using interpretative phenomenological analysis. Results highlight that the reasons or motives why teachers learn or initiate informal learning activities themselves can be diverse, depending mostly on the desired content of the learning. Concerning informal learning from others, results showed the prominent role of direct colleagues, mostly to refine their teaching, to find new teaching approaches or to find advice for class management. Teachers also report to learn deliberately from non-interpersonal sources in order to gain knowledge which serves them in preparing and giving their lessons. Furthermore, learning by oneself occurs before, during or after a job task and aims at studying content or optimizing existing work practices. Implications for practice and suggestions for future research are discussed.

1. Introduction

In today's dynamic and changing world, it is becoming increasingly important for workers in every field to engage in continuous learning and development in the workplace (e.g. Binnewies & Gromer, 2012; Shalley, Zhou, & Oldham, 2004). This also applies to schools and their teachers. Due to the emergence of new industrial production structures, new professions and associated skills and new types of information technology, current teaching content and methods are no longer meeting the changing needs of today's society (Tynjälä, Välimaa, & Sarja, 2003). According to Dirk Van Damme (2014) and Sonia Guerriero (2017) of the Centre for Educational Research and Innovation (CERI) of the OECD, European teachers lack the expertise needed to tackle the challenges schools are currently facing. In order to adequately anticipate and respond to these challenges, teachers need to engage in continuous learning in order to develop their competences. Educational institutions are expected to help teachers in their development, set up new teaching practices and help student to acquire skills to meet employers' demands (Tynjälä, 1999). Indeed, schools are dynamic contexts and it is therefore of foremost importance that schools invest in their human capital. It follows that teachers' workplace learning needs to be strategically supported. A better understanding of the way teachers learn informally and the reasons why they undertake specific learning activities could support schools to set up a learning environment that encourages teachers' informal

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learning.

In recent decennia, workplace learning has attracted increasing interest as a means of improving teachers' professional development (Lecat, Beausaert, & Raemdonck, 2018). Workplace learning can be both formal or informal, although most of the learning activities undertaken are informal in nature (e.g. Jeon & Kim, 2012; Marsick, 2009). In line with workplace learning literature, this study defines informal learning as the opposite of formal learning, which is structured, planned and requires the presence of an instructor (Marsick & Watkins, 2001). More specifically, informal learning can be characterized as self-initiated learning that encompasses an active approach in which learners actively give direction to their current and future learning rather than responding passively to environmental changes (Marsick & Volpe, 1999). In line with previous research showing that informal learning is one of the most prevalent and efficient types of workplace learning (Ellinger, 2005; Lecat et al., 2018), this study focuses exclusively on informal learning. A distinction is made between different forms of informal learning. Froehlich, Beausaert, and Segers (2015) and (Clough, Jones, McAndrew, & Scanlon, 2008) distinguish two forms of informal learning activities: social and individual informal learning. In addition, Noe et al. (2013) make a distinction between three types of informal learning activities: learning from others, learning from non-interpersonal sources (such as books or websites) and learning from oneself. Learning from others includes interacting with peers and superiors when requesting feedback or asking advice on strategies for performance improvement (social informal learning). Learning from non-interpersonal sources includes learning from other people by searching the internet and reading specialist articles in pursuit of useful resources and information. Here, the input comes from an external source but there is no social interaction involved. Finally, learning from oneself includes spending time reflecting on how to improve one's performance and experimenting with new ways of working (individual informal learning).

As this study applies the above cited definition of informal learning and makes a distinction between different subtypes of informal learning, it primarily takes a workplace learning perspective when studying teachers' informal learning. There is ongoing debate in the literature as to whether or not to use the term 'informal learning activities' or the broader term 'professional learning activities'. While in workplace learning literature the term informal learning is commonly used to refer to learning in the workplace context, literature on teaching and teacher education more often applies the term professional development. The above debate is informed by the discussion of how informal and formal learning are related to each other and if a distinction between both types of activities can really be made. It has also been argued that informal learning should not be used as a term, as it is imprecise (Billett, 2004). In addition, two extensive review studies on teacher learning in the workplace (Opfer & Pedder, 2011; Webster-Wright, 2009) have even argued to use the term "teacher professional learning", rather than "professional development" or "informal teacher learning". Whilst Billett (2004) suggests to use the terms 'participation and participatory practices'. Nevertheless, we believe that adopting a workplace learning perspective and thus using the term informal learning, is of added value to study teachers' professional learning and specifically their informal learning in order to include both social and individual informal learning as well as passive and active informal learning behaviour.

There are many research and review studies on teachers' workplace learning. However, existing studies are often conducted within a specific context or focusing on a specific sample. For example, with experienced teachers (e.g. Meirink, Meijer, Verloop, & Bergen, 2009), in the context of collaborative settings (e.g. Meirink, Meijer, & Verloop, 2007) or in the context of educational innovation (e.g. Bakkenes, Vermunt, & Wubbels, 2010). This study takes into account teachers' informal learning activities in the workplace, in general. Further, although a review study was conducted on antecedents and outcomes of teachers' informal learning in primary and secondary education (Kyndt, Gijbels, Grosemans, & Donche, 2016), not much is known about the importance that primary and secondary school teachers attach to the informal learning activities they undertake and how these contribute to their professional development. This study aims to provide complementary insights to the existing literature by adding a phenomenological approach, in order to complete descriptive approaches used in the past (e.g. Kyndt et al., 2016). In sum, the present study aims to examine in depth how teachers in both primary and secondary education perceive the way they learn informally and why they undertake different kinds of learning activities. The following two research questions are formulated:

- RQ1: What informal learning activities are undertaken by teachers in both primary and secondary education and what are their features?
- RQ2: Why do teachers undertake these activities?

2. Teachers' workplace learning: formal and informal learning activities

Following (Jacobs and Park (2009) definition, we can define workplace learning as "*the multiple ways through which employees learn in organizations*" (p.134). When defining these multiple ways of learning, most authors refer to formal and informal learning (Eraut, 2000; Eraut, 2004).

It is generally agreed that formal learning is a structured, planned, classroom-like activity involving a teacher or a trainer (Marsick & Watkins, 2001). It is similar to the traditional pedagogical paradigm of standard education using interaction (Hager, 2004). However, there is no common definition of the concept of informal learning, although recent studies have shown an increasing interest in the topic. According to Manuti, Pastore, Scardigno, Giancaspro, and Morciano (2015), informal learning refers to the acquisition of knowledge, skills or abilities through processes, professional experiences or reflections. Informal learning activities can occur in the context of problem-solving tasks, disruptive events, daily habits or commitments to improving practices (Smith, 2003). For Bratton, Prych, Mills Helms, and Sawchuk (2003) informal workplace learning can extend beyond paid work and prescribed work tasks. Bear et al. (2008) and Noe, Tews, and Marand (2013) argue that seventy-five percent of all that workers learn in organizations is learned through informal learning.

Based on Kyndt and Beausaert (2017) workplace learning, including informal learning, can be classified according to five dimensions. Below, we will discuss the different dimensions. Dimensions three and four both relate to the role of facilitators in the learning process (peers and coach). These two dimensions are therefore discussed in combination.

2.1. Where does learning take place?

Depending on the location where the learning activity occurs, researchers draw a distinction between on-the-job learning (learning takes place in the workplace) and off-the-job learning (learning takes place outside the immediate working environment) (Clarke, 2005). In the case of teachers, this dimension is particularly relevant because their work takes place both at school (e.g. in the classroom or the staff room) (e.g. Mawhinney, 2010) and outside school (e.g. when marking homework or preparing classes).

Stern and Sommerlad (1999) suggest reinterpreting the concept of workplace learning to take into account its “elasticity”, arguing that workplace learning also occurs beyond the physical working environment during work events, meetings with clients, conferences, etc.

2.2. To what extent is learning planned?

The second dimension refers to the extent to which workplace learning is planned. In line with the second dimension, Eraut (2000; Eraut, 2004) distinguishes between deliberative, reactive and implicit informal learning. The term deliberative learning refers to planned engagement in learning activities created especially for learning. This kind of learning requires defining goals and allocating time for the acquisition of knowledge, skills or abilities. Deliberative learning activities can be formal or informal. Reactive learning activities are unplanned and usually unintentional. However, the knowledge gained is made explicit, so the learner is conscious of what has been learned. Finally, implicit learning is unintentional and unconscious. This lack of awareness may prevent learners from realizing they have actually learned. Overall, since informal learning can occur spontaneously and unconsciously, it is often difficult to observe and measure (Kyndt, Dochy, & Nijs, 2009).

2.3. What is the role of others?

Several authors classify learning activities based on whether or not they happen in the presence of others (e.g. Clough et al., 2008; Froehlich et al., 2015; Kwakman, 2003; Noe et al., 2013). The terms often used to draw a distinction between the two are “social” versus “individual” learning. This is in line with studies examining informal learning in various occupations in which it was found that informal learning behaviours are either self-focused or other-focused (Doornbos, Simons, & Denessen, 2008; Lohman, 2005; Lohman & Wolf, 2001).

Individuals can benefit greatly from social interactions with colleagues, supervisors or others (Christensen, 2013; Jeon & Kim, 2012; Marsick, 2009). It is argued that social informal learning behaviours can improve job performance, particularly in knowledge-intensive organizations (e.g. Rosette, Mueller, & Lebel, 2015). By seeking information through discussion and observation, people can learn from the experiences of others (Collin, 2002). Their main sources of learning are experts and colleagues, both within and outside the immediate work setting (Skule, 2004).

2.4. How pro-active is the learner?

The fourth dimension refers to the pro-active role of the learner during the learning activity. In contrast to passively integrating ideas via observations and discussions, learners can be pro-active, meaning that they adopt an active and self-initiated approach to learning. Pro-active learners develop themselves autonomously by learning from others, from non-interpersonal sources or from themselves. Teachers are expected to undertake formal training as well as proactively engaging in informal learning activities to keep themselves up-to-date and to ensure that they can keep on delivering high-quality education. It has been demonstrated that a teacher's willingness to learn can be a condition for learning to occur (Rytivaara & Kershner, 2012).

In summary, people learn both formally and informally. Their informal learning takes place through social interaction, by consulting non-interpersonal sources or via individual learning activities. The stimulus can be reactive, deliberative or implicit. These types of learning can all be grouped into the following four dimensions: (1) the location of the learning, (2) the extent to which the learning is planned, (3) the presence and role of others and (5) the pro-active role of the learner (Jacobs & Park, 2009; Kyndt & Beausaert, 2017).

3. The role of informal learning in teachers' professional development

Previous studies have been conducted on teachers' informal workplace learning in relation to various outcome variables, such as professional development (e.g. Hoekstra, Brekelmans, Beijaard, & Korthagen, 2009), competence development (including knowledge, skills and attitudes) (Matthews, 1999; Van Eekelen, Vermunt, & Boshuizen, 2006), employability competences (Froehlich et al., 2015; Lecat et al., 2018) and innovative work behaviour (Lecat et al., 2018; Messmann & Mulder, 2011). More specifically, Fraser (2010) conducted a longitudinal study following two experienced primary school teachers. She used questionnaires, semi-structured interviews and video-stimulated reflective dialogues. She found that informal learning activities – defined as learning activities sought and set up by the teachers themselves – fill gaps in teachers' subject knowledge after they have started teaching. Similarly, Matthews

(1999) showed that teachers' workplace learning (which is task-focused, in a social and collaborative context and cognitively different from learning in schools) tends to be perceived by teachers as the main way to gain knowledge. Van Eekelen et al. (2006) interviewed 14 high school teachers and found that teachers learn specific technical skills by undertaking informal learning, i.e. learning that is reactive, near-spontaneous and unplanned. Hoekstra et al., (2009) also found that secondary school teachers tend to learn new teaching methods through informal learning, i.e. learning without systematic support. Hoekstra and Korthagen (2011) conducted a longitudinal mixed-method study that followed a novice teacher over a two-year period (one year without systematic support and one year with individual supervision), and Burns, Schaefer, and Hayden (2005) conducted a longitudinal study with 48 teachers. Both studies resulted in the finding that teachers develop social and professional behaviours informally, through informal learning such as on-the-job learning, through trial and error or as a result of suggestions from other teachers. Finally, a questionnaire study conducted by Lecat et al. (2018) showed that most social informal learning activities (feedback, help and information seeking) can enhance both primary and secondary school teachers' employability competences and support their innovative work behaviour. For an overview of studies researching the outcomes of teachers' informal learning, we refer to the review study conducted by Kyndt et al. (2016).

4. Methods

4.1. Data collection and interview guideline

Since we were interested in teachers' perceptions and sense-making of informal learning, a qualitative interpretative design was used (e.g. Larkin, Watts, & Clifton, 2006). Data from teachers were obtained through semi-structured interviews with open-ended questions. This allowed us to collect relevant information while leaving participants sufficient room to express their personal perspective. Teachers' anonymity was guaranteed. A pre-test of the interview guide with two teachers resulted in minor revisions to improve the clarity of a number of questions. The interviews lasted between 40 and 60 min and were audio-recorded and transcribed verbatim in order to facilitate encoding and the processing of interpretations. The initial questions were about the ways in which teachers were continuing to learn in their profession and their most meaningful learning activities. Next, a number of key questions were asked about the characteristics of specific learning situations: the circumstances (how and when learning took place), the content (what was learned), the stimulus (why learning took place) and which sources were used. At the end of the interview, each teacher was asked to state his/her age, gender, years of experience, school and teaching level (primary or secondary school).

A total of 41 teachers from the French-speaking community of Belgium participated in the interviews on a voluntary basis. 19 participants were teaching in primary schools and 22 in secondary schools. The sample consisted of 80.49% women ($N = 33$) which is in line with the statistics for the French-speaking community of Belgium (FWB indicators, 2017: 72.1% of total teaching staff are women). The age of the teachers varied from 21 to 60 years, with a mean age of 35.3 years. The average number of years in the teaching profession was 11.7 (ranging from 1 to 38 years of experience).

4.2. Data analysis

Data for this study were analysed using interpretative phenomenological analysis (IPA), i.e. qualitative analysis focusing on how teachers make sense of their learning activities (Larkin et al., 2006). The researchers first familiarized themselves with the data by reading and re-reading the transcripts line-by-line at individual case level. To identify which learning activities had been undertaken by school teachers, researchers analysed the 340 meaningful units of reported learning activities from the 41 interviews.

The researchers then summarized the learning activities in descriptive codes of a few words and grouped these brief descriptions into themes representing the learning activities undertaken. Where possible, the characteristics of the learning activities were specified in terms of content, source, circumstances and stimulus. Each learning activity was also classified using the classifications (learning from others, learning from non-interpersonal sources and learning from oneself) developed by Noe and colleagues Noe et al. (2013). In cases of doubt, the authors of this study discussed which coding would be appropriate (Larkin et al., 2006; Smith, 2004) (Table 1).

5. Results

To start with, participants were asked, "How do you continue to learn aspects of your job?" As expected, all participants reported learning informally by giving the interviewers examples of such learning activities. As mentioned before, each reported informal learning activity was categorized into one of three groups, according to the conceptual framework developed by Noe et al. (2013). The first category was social informal learning (or learning from others), such as asking for feedback and tips or observing other teachers in the workplace. The second category was learning from non-interpersonal sources, such as books or websites. The third category was informal learning from oneself (or individual informal learning), for example by reflecting on one's own teaching practice or experimenting with trial and error. This classification was used to present our results. Table 2 shows an overview of the frequencies of all the informal learning activities.

Table 1
Coding matrix.

Type of informal learning	Learning Activity	Example of descriptive codes	Statement examples
Learning from others	Speaking to colleagues	Seeking feedback from colleagues	« Well, I would say that I'll start by looking for my colleagues. I need to be reassured. (...) But I definitely do not want to be restricted in my way of doing things and so I will quickly look for others who are saying "I did it like this... It worked". And I'm waiting for something at that moment. I'm waiting for a dialogue, a contact, that's it. It can be on the subject, as I was saying. » (33)
	Talking to other people, non-colleagues	Asking my mother (speech therapist)	« My mother is a speech therapist. When I am stuck in a situation, I ask her what I can do. » (22)
	Observing	Observing other teachers during remediation	« I have one hour a week, well several hours in fact, I spend on remediation with students in other teachers' classes and so I also observe how they do things a little bit. » (36)
	Listening to students	Listening to students' questions	« That's also what makes the job enriching because you also learn from it, for example when your students ask, "I heard this, I heard that... Is it true? Is it related to what we do in class? » (34)
	Coworking	Working as a team with other teachers (in the case of secondary education: teachers who teach the same subject in the same school)	« We are a group of several science teachers who work in the same institution and in the same years and we have the CE1D [Editor's note: certificate for the first level of secondary school] that our students will officially pass. We'll prepare our students for the second level as well, but we don't have a lot of basics there. And we have to learn to... it's also the first time we're going to be working as a team. » (32)
Learning from non-interpersonal resources	Reading	Seeking information in a book	« If I search in a book, I will indeed look for information on how to give a lesson on the topic, but I will find lots of information. I will have to make choices. » (27)
	Watching films or documentaries	Searching for and watching documentary films on YouTube	« Every day, I nurture my curiosity. I love watching history documentaries, sometimes I search on YouTube and I type keywords for themes that interest me. Boom, I'm lucky. I come across a video clip that is exactly what I needed. So not only am I nurturing my own curiosity, but I'm also making it accessible to students so I can reuse it in class. » (37)
Learning from oneself	Reflecting	Analyzing my own work	« I'm really trying to analyse my own work to see what I can improve or what I need to remove. » (40)
	Trial and error	Trying things out in the classroom	« I tried something out, and it felt good, it worked better, the students responded positively to it, and so I continued because it was effective. » (15)
	Learning by doing	Learning about software by doing	« When you learn about software, you learn on your own, but there are basic things people should tell you. » (25)
	Self-study	Searching for and studying information by myself, to use in course	« For example, I give courses on formative assessment. As part of this course, I had to find out what a competency assessment is, and I realized that I wasn't practicing this kind of assessment in my class. » (1)
	Doing educational visits and excursions	Taking a trip	« I am a geography and history teacher. When I travel, as soon as I leave home, I have certain reading keys from my initial training that allow me to learn things by observing the landscape, by observing the territory. If I go by plane, I have an aerial view. I manage to structure Brussels from the aerial view, so it's all learning thanks to the basic geography skills. (...) Well, thanks to the skills I have developed, I know how to recreate examples and learn things about each particular case by going to a metropolis and visiting it with a map, using my eyes and my feet. » (37)

6. What kind of informal learning activities teachers undertake?

6.1. Informal learning from others

Teachers learn a lot in social contexts by seeking feedback, information and help from others. Interviews showed that informal learning from others (or social informal learning) takes different forms and is usually deliberative. People ask for help and advice from colleagues, who are seen as experts, as well as from people outside school.

Table 2
Frequencies of informal learning activities.

Classification	Number of occurrences
Learning from others	178
Speaking to direct colleagues	92
Talking to non-colleagues, other people	42
Observing/visiting	16
Listening to students	11
Sharing with colleagues	10
Coworking	7
Learning from non-interpersonal sources	83
Reading	72
Visiting	4
Watching films or documentaries	5
Observing	2
Learning from oneself	79
Reflecting	31
Trial and error	25
Learning by doing	14
Self-study	5
Educational visits and excursions	4

6.1.1. The prominent role of direct colleagues

Our data revealed that teachers believe social informal learning activities with direct colleagues make most sense and contribute best to their professional development. This kind of learning most often takes the form of discussions and the sharing of information and experiences. By passively listening or observing or by pro-actively asking for advice or by discussing issues, teachers learn from the experience of others. Most interactions take place in the hallway, for a few minutes only, in-between classes, in the staffroom and during work meetings. Teachers also learn from direct observations, with or without interaction. Interviews showed us that teachers value their colleagues' opinions in discussions or in work practices.

For me it is what is most important in the profession... the exchanges with colleagues. I believe this is the fastest and most beneficial way. (13)

More specifically, teachers reported learning from their direct colleagues in three ways. The first way was through having discussions with colleagues. These discussions were initiated by colleagues or by themselves.

I learn by talking to colleagues; either informally in the staffroom or at meetings organized by the school management. We exchange class preparations and share anecdotes and interesting literature and this allows me to "adjust" my professional practice. In addition, we try to work in parallel. (12)

Secondly, they reported sharing experiences, tools and materials, sometimes in meetings, sometimes through the use of a learning management system.

For example, she (the principal) has created an online storage space with digitized textbooks, standard class preparations, etc. Everyone can post what they want and use it as they wish. This helps us to function more like a team, rather than each being hidden away in our own little classroom. (8)

Thirdly, they reported learning by observing, mostly when teaching in the same class. For example, opportunities of observation occur when one teacher is giving a class while the other takes care of special needs students (or students who are working at a slower pace) in the same room.

I have one hour a week, well several hours in fact, where I spend time in other teachers' classes to do remediation and so I also observe how they do things a little bit. (36)

6.1.2. The role of non-direct colleagues

Teachers not only report learning within the school, but they also mention external contacts such as teachers from other schools, friends, other professionals and even family members as important learning sources. These people can help them to learn or to deal with problems.

I went to another school and I attended an open day. It allowed me to see what was being done elsewhere to manage a school and how projects are carried out with students. I talked to teachers from that school and it was very informative to hear other viewpoints. (23)

Sometimes, teachers from other schools or former colleagues can also have valuable opinions and are therefore perceived as experts and essential learning sources.

So now I'm going to get information either from a colleague or from another teacher from the first school I worked at when I was student, because I still have contacts there. (27)

Furthermore, teachers can also learn from their students - another group of crucial actors at their workplace. Here, a distinction can be made between learning from students in a social learning activity context such as an evaluation of disciplining rules or teaching methods, and learning by observing students during a learning activity, for example by looking at students' reactions when

teachers are trying out something new.

What happens to me quite often is that I go and find friends of a student, if I have a discipline problem with him. I'll seek the support of other classmates, and I'll try to understand how they handle daily living with that person, outside the classroom. How they deal with him. Maybe I'll get information from them about the student, and not from the headmaster, educators or teachers as we often do. (33)

Finally, teachers can learn socially by visiting museums or education fairs and having discussions with people who they consider to be experts. As the learning activity is based on social interaction, this represents an additional form of social informal learning for the teachers.

One day we went to a museum where the guide warned us to be critical when making deductions about what ancient food traces might mean. (...) So I learned a lot for my own practice. (27)

6.2. Learning from non-interpersonal sources

In the case of learning from non-interpersonal sources, another person is used as the learning source, but the social learning context is absent. These kinds of learning activities usually entail searching through literature, in a book or on a website, with the aim of finding new pedagogical and didactical ideas. This kind of learning allows teachers to seek information anywhere, anytime. More specifically, through the interviews five types of learning from non-interpersonal sources were identified: reading (manuals, books or internet), listening during conferences, visiting museums or exhibitions, watching movies or documentaries and searching for documents on the internet, more specifically on discussion fora. The latter is included in this category because teachers reported membership of online communities of practice in the context of seeking information but without mentioning having exchanged or shared knowledge and information with other people.

Teachers particularly value learning through reading and seeking information in books and on the internet. It appears to be an effective and easy way of finding new information.

Or even asking myself a question about what a student asked me. He asked me something super-specific and I don't have the answer in my head, so I'll try to find out on the internet, in books or somewhere else so that I can give him the most precise and accurate answer possible. (32)

When they want to learn about didactics and work practices, teachers often go to online discussion fora or watch online videos. This gives them access to a variety of pedagogical methods which can be assimilated.

And I also do a lot of research. So I watch YouTube videos about learning equations, learning prime numbers, ideas... I find ideas on the internet, then I try to use them in class. (36)

Sometimes, teachers undertake activities in which personal and professional interests are combined. For example, while developing their general cultural knowledge, they happen to realise that a particular video fragment might be useful as content or the source of learning for their own teaching practice. In this way, they acquire subject-related knowledge at the same time as further developing their teaching practice.

I also watch documentaries. I watch them knowing that, I mean, I watch scientific animal documentaries. I know that there are many things that can be used in the first year. And whilst watching, I think a little bit, saying to myself, well, yes, that's a fragment I could use to illustrate such or such thing or as part of a particular exercise. (34)

6.3. Informal learning from oneself

The last category of informal learning activities is learning from oneself by analysing and optimizing one's own knowledge or work practices on an individual basis. We identified five individual informal learning activities: reflecting, trial and error, learning by doing, visiting and self-study.

Reflecting and trial and error are learning activities which find their origins in meaningful events. Teachers identify an event as a critical incident, and reflect on it. Classroom situations in which new things are tried out are often seen as key events for teachers because they are stressful. The interest in this key event could also originate from the fact that the situation revealed a new facet of the teacher that he/she was not previously aware of or that helped the teacher to understand students better.

Sometimes it happens that afterwards I say to myself "If I had reacted like that, or if I had reacted like that instead, it would perhaps have been better". So I think about it myself and then, from experience, I know that the next time, well, I will react differently. (41)

Self-study entails the re-reading of a course manual before the actual teaching session, revising its design or doing exercises before students start doing them. It is important for teachers to know the didactical material well and to be able to answer every question. Self-study is a learning source in itself but it also can induce reflection about the course. Revising the content of the course and its design is something every teacher does, but only a few mentioned it during the interview. We therefore assume that teachers perceive it as a normal work activity and not as a specific learning activity.

I learn about the topics before I prepare my lessons. I don't limit myself to what I plan to teach to the children. If I'm going to see something with them, I find out about it first. If we are going to make a study visit, I'll go on my own first, that's it. And I still learn every day, of course. (28)

Reflection is thinking over a past experience or acquired knowledge critically, to detect the essential elements and consider doing it differently in the future. Kolb (1984) describes this as 'reflection on experience'.

Yes, it makes me change what I do in class a lot. For roughly the same reasons, I engage in a kind of global reflection and

questioning about the new information I learn every day in a formal or informal way. (30)

In the same vein, trial and error can be understood to be immediate reflection during the action. It entails noticing a problem during the action and adjusting the action in order to resolve the problem.

Well, you know, the trial and error thing, it's the scientist thing, um, doing something, seeing how it works, and adapting it. I think it makes you change, I hope at least for me, when you make a mistake, you gain experience and then you don't make the same mistake again... or in any case, you try to change immediately so that it is coherent or related to, well, it looks like what you wanted to do, in the end. (34)

Learning by doing may seem closely related to the concept of trial and error, but teachers do not perceive it in the same way. Trial and error is perceived by teachers as something they do to adapt to a problem, while learning by doing is related to school and class innovations and drawing lessons from it. According to this definition, it is more closely connected to reflection.

I improvise, I innovate to improve students' skills or to improve the atmosphere in the classroom. Yes, I would say that I learn things in class that allow me to adapt better, depending on the context. (2)

Finally, visiting places can be an individual learning activity or a learning activity from non-interpersonal sources, depending on the type of learning sources used. A "visit" can be social (e.g. visiting another school and engaging in social interactions with people), individual (e.g. visiting a place and learning individually from reflecting on what one sees) or non-interpersonal (e.g. visiting museums or exhibitions and learning from informative texts or video clips), depending on the description of the teacher's example. One teacher mentioned her visit to a foreign country as an example of individual learning.

I am a geography and history teacher. When I travel, as soon as I leave home, I have a certain reading heuristic obtained during my initial training that allows me to learn things by observing the landscape, by observing the territory. I go by plane, I have an aerial view, I manage to structure Brussels from the aerial view, so it's all learning thanks to the basic geographical tools. (37)

6.4. Why do teachers undertake informal learning activities?

Reasons or motives why teachers learn or initiate informal learning activities themselves can be diverse, depending mostly on the desired content of the learning.

Novice teachers or teachers assigned to a new class need to learn how to manage the new class and what methods work with students of this age and level. To do this, teachers first see and ask advice from fellow teachers at the same level or from the same subject.

Young teachers learn a lot when they have a good relationship with more experienced teachers. Yes, I think they still have to learn a lot from experienced colleagues. Once you finished teacher education, pfew, you're all alone when starting the school year and have responsibilities, I find it very nice to have an experienced teacher who works with you and who gives you advice, for example a logical order of subjects to discuss in class. (5)

Teachers can also read and use method books in order to create lessons, occasionally starting from what other teachers have already created.

I will look into my colleagues' manuals and use it to set-up my own class. (8)

Once teachers have established their classes and are teaching, they may want to refine their teaching or find new teaching approaches. In this case, it is easier when colleagues who have experienced different learning methods already explain them and share advice.

Sometimes I ask my direct colleague how she teaches her lesson and sometimes she does it in a different way than I do, and that's interesting. The subject can be approached in different ways. (5)

I learn by talking with my colleagues. Either informally in the teachers' room or at meetings organised by the management of our school. We exchange learning sequences, share anecdotes, interesting readings and this allows me to "adjust" my professional practice. In addition, we try to work in parallel. (11)

Teachers may want to adapt to their students, differentiate their teaching methods or improve the way they teach. For this reason, they learn or read about learning methods and ask colleagues concrete ways of doing so in class.

Trainings do not give me concrete ideas for my class, but rather theoretical information. In the end you come out with little practical information and you have to talk about it later on with your colleagues, or with the speech therapist, to make sure you can use it every day in your classroom. (9)

In contrast, when teachers are looking for new information, new ideas or new class activities, they tend to have two main approaches: learning from others or from non-interpersonal sources. The latter mostly takes the form of reading.

I undertake a search for information on my own. I visit forums on the internet, or more official websites, or I read books. (8)

I will mainly look for additional information in the resources at my disposal. When I talk about the resources at my disposal, I am of course talking about books, etc. on the subject matter. (29)

Concerning learning new ideas from others, teachers prefer to ask people they consider experts in a specific domain (e.g. in their teaching subject, about specific troubles or about students).

Being in class and asking myself questions also pushes me to address some of my colleagues who I know have a good knowledge in certain fields of expertise, for example the CPMS members for the social aspect, the orientation of my students, and the information on the families they meet. And speech therapists for language disorders. Some colleagues who have been trained for behavioral disorder also provide me with information. (10)

Teachers sometimes have (discipline) troubles in class. In these cases, they first ask their direct colleagues, headmaster or educators for advice and guidance. Advice can be concrete examples, anecdotes or sources to consult.

My first reflex is to talk to colleagues about it. Because in general, well, they have already been confronted with this problem and therefore, they have resources on it, they have books, they have ideas of sequences, etc. (39)

6.5. The role of educational level and location and time

6.5.1. Educational level

Interviews showed that there is a difference in how primary and secondary school teachers define colleagues. Primary school teachers consider all teachers at their own school as direct colleagues, and sometimes even include teachers from other schools. For secondary school teachers, direct colleagues are teachers within the same subject domain or teachers who teach in the same classes. Teachers teaching different subjects to different students are not considered to be direct colleagues. This can be explained by the lack of opportunities to meet these other teachers and the lack of reason for exchange and discussion. No other differences were found between primary and secondary school teachers.

6.5.2. Location and time

Although teachers gave us many examples of social learning activities (or informal learning from others), all the activities with direct colleagues took place in school and during working time. When other people were involved, it was usually after working time and outside school. Only one occurrence of a social learning activity outside the school but during work time was reported. The example was given by a primary school teacher who went to another location outside the school to correct exams, where she also met teachers from other schools in the same district.

We did not find any differences between male and female teachers or between young/novice and older/experienced teachers in terms of the types of learning activities undertaken and how these teachers made sense of them.

7. Discussion and conclusion

The focus of this article is teacher's informal learning. Within the dynamic context in which schools and teachers function, these informal learning activities are gaining in importance. More specifically, we focused on primary and secondary school teachers' informal learning by analysing how they perceive the way they learn informally and why they undertake learning activities. Insight into the way teachers learn informally might help school principals to create a powerful learning environment in which informal learning can flourish.

Many authors have divided the multiple ways of learning into the two categories 'formal learning' and 'informal learning' (Eraut, 2000; Eraut, 2004). Formal learning refers to the traditional paradigm of standard education (Hager, 2004) comprising planned structured activities with a trainer or a teacher (Marsick & Watkins, 2001) while informal learning is often defined as the contrary. Noe et al. (2013) recently identified three types of informal learning activities: learning from others, learning from non-interpersonal sources and learning from oneself. Our results confirm the typology outlined by Noe et al. (2013). Our results also confirm the typology of workplace learning as defined by Jacobs and Park (2009) and the distinction between four dimensions of workplace learning: location, planning, the role of others and the degree of pro-activity. If we take the fourth dimension (the pro-activity of the learner) as an example, the teachers we interviewed reported having learned from others via both proactive and passive social informal learning activities. For example, a teacher can learn informally by actively asking questions to colleagues or by passively observing another teacher in the same class without consciously observing him or even thinking about the observation.

Secondly, it was found that direct colleagues, mostly considered as experts in their field, play a crucial role. Discussions with direct colleagues were mentioned frequently and make a lot of sense for teachers because it is easier to communicate with and seek support from a peer with whom they have more in common (Christensen, 2013). Results showed that people ask for help and advice from colleagues who serve as internal experts as well as external persons. Teachers learn from the experience of others both by passively listening or observing and by actively asking for advice or discussing issues. The findings showed us that teachers value their colleagues' opinions and experiences, shared either during discussions or in the context of work practices. This confirms previous research by Collin (2002) and Skule (2004). They found that people can learn from the experiences of others via discussions, listening or observation (Collin, 2002) and that interaction with colleagues and experts is considered important (Skule, 2004). Opportunities for interaction take place in the staffroom where teachers meet each other or during work meetings. This was also found by Mawhinney (2010) who indicated that teachers highly appreciate staffroom encounters and staff meetings because they provide opportunities for social interaction to occur. Furthermore, teachers also learn from direct observations, with or without interaction (Kyndt et al., 2016).

Whilst learning from direct colleagues means something slightly different to teachers in primary schools than to teachers in secondary schools, both groups of teachers agree that discussions and sharing with direct colleagues are the most important sense-making learning activity. However, secondary school teachers draw a distinction between colleagues teaching the same subject, considered as experts in the subject, and colleagues teaching in the same class, considered as important resources for solving teachers' difficulties with classroom management. Most of these social learning activities occur in school and during working hours. Teachers indicated that they sometimes had the feeling of being judged by other teachers when talking about a difficulty they faced or/and asking for feedback. They also indicated a fear of not receiving honest feedback from colleagues (e.g. also Baert, De Rick, & Van Valckenborgh, 2006). In line with previous research, some teachers referred to the wish for more school support, for example, through meetings and sharing groups (Kyndt et al., 2016).

Thirdly, in addition to social informal learning, teachers can also learn from non-interpersonal sources. This category of informal

learning activity is mostly deliberative and requires proactive and goal-directed searches. Furthermore, these active learning activities are generally undertaken in order to find new ideas on pedagogy or didactics. This is in line with previous research indicating that this type of learning activity is undertaken in the pursuit of useful resources and information (Noe et al., 2013)

Fourthly, informal learning activities can also include learning from oneself. Learning from oneself consists of studying, analysing and optimizing work practices or knowledge. It can be done before the teaching activity via studying or planning, or during the activity itself in the form of on-the-spot reflection on what is happening, or after the action by looking back and reflecting and thinking about how to improve the activity.

7.1. Limitations and suggestions for future research

This study has some limitations. Firstly, the research was restricted to teachers' perceptions about their informal learning activities. Our interview guideline was designed to capture teachers' perceptions of the type of informal learning activities they undertake and the meaning and relevance teachers attribute to them, often implicitly, rather than trying to incorporate all informal learning behaviours. Future research could further unravel the typology of informal learning. In addition, the learning content (what is being learned) could be studied in greater detail. This fell outside the scope of the present study. Depending on what is being learned, different types of informal learning might be undertaken. However, very few examples of learning content were given when teachers reported on their informal learning activities. Usually, teachers gave general indications such as "course content", "methodology", "ways of doing things" or "different approaches".

Secondly, in order to identify how teachers make sense of informal learning activities, self-reported data was collected. Although we believe that applying a phenomenological approach is helpful in unravelling the type of learning activities teachers undertake and why, it is possible that teachers only reported (1) learning activities of which they felt comfortable sharing, avoiding more embarrassing learning stories; (2) learning activities they remembered; (3) learning activities which are interpreted as true learning to the participants, but differs from our conceptual definition, or (4) learning activities which are part of a more generalized story, therefore limiting our view into more salient aspects of their learning (e.g. Hoekstra, Kuntz, & Newton, 2018). Future research could consider conducting observations of individual teachers or teacher teams to measure individual and social informal learning.

Thirdly, most of the examples we collected through our interviews were of informal learning in general, and deliberative informal learning in particular. It might be the case that deliberate informal learning activities were more readily recalled, because reactive or implicit informal learning behaviours are hard to measure through interviews. Future research could adapt other ways of measuring informal learning, for example through socio-metric badges (e.g. Kim, McFee, Olguin, Waber, & Pentland, 2012) or through observation.

Fourthly, the generalizability of our results might be limited. All the teachers interviewed came from the French-speaking community in Belgium. Future research could compare different countries and communities in order to be able to generalize the results even more.

Finally, although our results hint at factors that may foster or inhibit teachers' informal learning, the reasons why teachers do or do not undertake informal learning activities were not investigated. Future research could study the reasons why teachers undertake informal learning and which factors foster or hinder the undertaking of different types of informal learning. See in this context the review study conducted by Kyndt and colleagues (2016), mapping the antecedents of teachers' workplace learning. Their review study could be a good starting point from which to further explore potential antecedents of teachers' informal learning.

7.2. Practical implications

This study pinpoints a number of practical implications for teachers and schools. The study challenges the idea of teachers undertaking formal learning activities as their main means of developing professionally. Results show that teachers have a wide range of informal learning activities at their disposal to be used in their continuous learning and development. Informal learning activities are important for teachers' professional development and therefore need to be supported by school principals. More specifically, according to the teachers themselves, social informal learning activities involving direct colleagues within the same school and even teaching the same subject in the same year are pivotal. Schools can foster the exchange of knowledge with direct colleagues by setting the stage for a supportive, non-competitive working environment in which mistakes can be made and doubts can be discussed, without being judged. In that sense the school can turn a largely individual job into a job that requires teamwork. Teachers spend many hours alone in the classroom. Making sure that there are sufficient platforms in place (in the form of debriefings, meetings, discussion groups, etc.) in which knowledge exchange can flourish is crucial.

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